Memorandum

Date: 03/13/2013

To: Jeff Lux

From: Mathew Crawford
Pat Higgins
Jeff Binder

Re: Cimarron Environmental Response Trust Site WAA Pneumatic Slug Testing

Background

Burns & McDonnell personnel conducted 14 pneumatic slug tests in the Western Alluvial Area (WAA) of the Cimarron site from February 4 through February 7, 2013. The purpose of the testing was to validate hydraulic conductivity (K) values derived from previous aquifer test results (Well GE-WA-01) as well as to evaluate spatial variability of K values in the WAA. The intent was that these values could then be incorporated into the groundwater flow models needed for design of the WAA groundwater extraction system.

The field activities were performed from February 4 through February 7, 2013 using a Geoprobe Systems® Pneumatic Slug Test Kit and the ASTM Standard Practice D 7242 (ASTM, 2007a) conforming to Geoprobe Instructional Bulletin No. MK3181 (Geoprobe, 2011) procedure modified for the use with monitoring wells and a straddle packer.

Methodology

Due to the anticipated high values in the WAA as determined by previous slug tests and aquifer tests, pneumatic rising head slug testing was chosen over the conventional mechanical slug test method. Pneumatic rising head slug testing provides more viable data in high K aquifers (K values greater than 1×10^{-2} centimeters per second (cm/sec)) because the displacement can reach zero before a mechanical slug is fully inserted or removed (McLane, 1991). Pneumatic rising head slug tests are conducted by placing a pressure transducer connected to a high speed data logger below the water table in a sealed well and pressurizing the well with air. This well pressure depresses the water level until the pressure is instantaneously equilibrated with the atmosphere by opening a quick release valve. Once the well is at equilibrium with the atmosphere, the water level will recover to static as in a slug out mechanical rising head slug test.

With the exception of Monitor Well T74, all wells tested were screened above the water table. In these wells, pressurization is impossible due to the depressurization of the air being injected into the well. This would allow the air to bleed out through the screen into the formation preventing the water level from being depressed. As a result of the conditions a 0.5 inch inside diameter (ID) 1.8 inch X 2 inch Solinst® straddle packer was threaded onto 0.5 in chlorinated polyvinyl chloride (CPVC) tubing, inserted into each well below the water table and inflated to

40 pounds per square inch (PSI) prior to testing. The straddle packer and tubing assembly then functioned as the well casing. The Geoprobe Systems® Pneumatic Slug Test manifold was then attached to the 0.5 inch tubing. Though the 0.5 inch diameter tubing and packer are of sufficient size to conduct pneumatic slug tests, the smaller diameter can lead to underestimation of K values due to frictional well loss (Butler, 1998). The manifold consists of a valve connected to an air pump for well pressurization, a pressure gauge for measuring the well pressure, a release valve and a port for inserting the pressure transducer which was connected by cable to a high speed data logger. Figure 1 is attached and presents a general schematic of the pneumatic slug tests.

For Monitor Well T74 the manifold was threaded onto an assembly that mated with the 2 inch diameter casing allowing the well as originally constructed to be pressurized.

The 14 wells (T51, T54, T58, T59, T62, T74, T81, T82, T84, T86, T88, T89, T91, 1343) tested were chosen to maximize the spatial distribution of K values derived from the test data (Figure 2). At each of the wells, a minimum of three pneumatic tests were performed. Table 1 summarizes the relevant construction data and slug test setup parameters for each of the wells tested. Field notes are attached and presented in Attachment 3.

Results

Following the completion of the pneumatic slug tests, recovery data collected with the data logger was downloaded and K values for the aquifer surrounding each well were calculated using AQTESOLV™ software.

Ten of the wells (T51, T58, T74, T81, T82, T84, T86, T88, T91, 1343) displayed oscillatory response curves. As a result the solution used to analyze the data from those wells was the Springer-Gelhar (1991) Solution for a Slug Test in an Unconfined Aquifer. The Springer-Gelhar solution was also used to analyze the data for the remaining wells (T54, T59, T62, T89) which displayed response curves similar to exponential decay. The Hvorslev (1951) Solution for a Slug Test in an Unconfined Aquifer was also used to analyze data from the wells displaying exponential decay response curves. For Monitor Wells T54 and T89, the Hvorslev (1951) solution was chosen as the primary solution while the Springer-Gelhar (1991) solution was chosen as the primary solution for Monitor Wells T59 and T62. Table 2 presents the test solution results for all monitor wells tested. The solutions and data for each well tested are attached and presented in Attachment 4.

Test solutions for Monitor Well T89 appear to be lower than predicted based on lithologic conditions and presumed aquifer characteristics. The data set for Monitor Well T89 showed

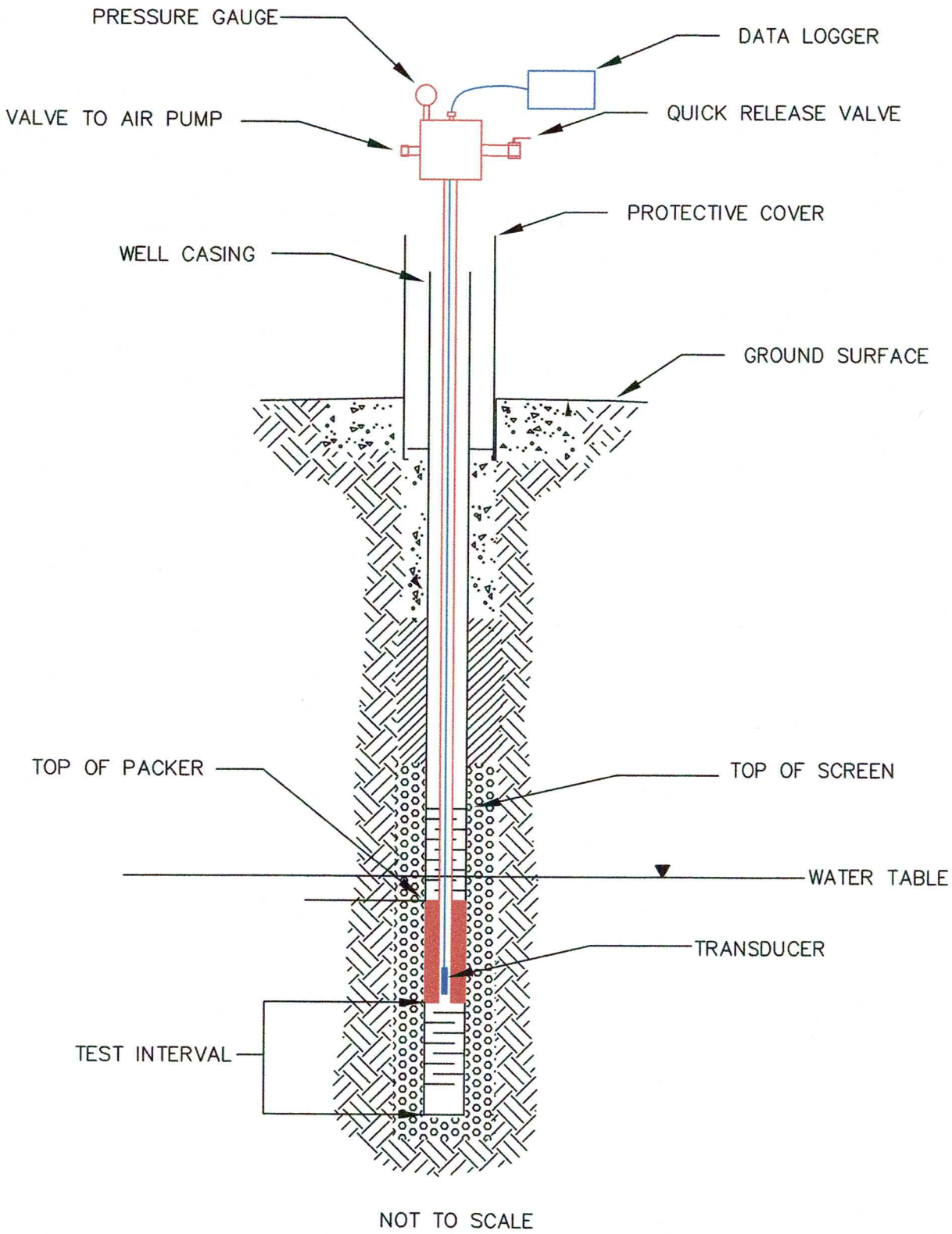
anomalous head values after the initial displacement. These anomalies may have been caused by non-instantaneous equilibration upon opening of the quick release valve. As a result the test solutions may have K values lower than predicted.

K values for the wells tested ranged from 2.5 X 10^{-3} centimeters per second (cm/sec) at Monitor Well T59 to 9.0 X 10^{-1} cm/sec at Monitor Well 1343. The mean K value for the WAA as calculated from the pneumatic slug test solutions was 1.5 X 10^{-1} cm/sec. These K values are consistent with previously collected slug and aquifer test data from the WAA as well as K values derived from testing previously performed in portions of the eastern alluvium near Burial Area #1 (BA#1) (reference to Figure 2). Based on these results there is some spatial variability in K values for the WAA. As the mean indicates the majority of wells tested showed K values on the order of magnitude of 10^{-1}. K values lower than the mean were found predominantly along the escarpment and in the northeast section of the WAA. The lower K values along the escarpment may be attributed to facies changes similar to that of the transition zone; lower values found in the northeast portion of the WAA may be attributed to lithologic changes associated with the fining upward sequences commonly associated with alluvial sediments.

MC/MC/jlb

4 Attachments

ATTACHMENT 1
Figures



NOT TO SCALE

Figure 1

Pneumatic Slug Test Schematic
Cimarron Env. Response Trust
Crescent, OK

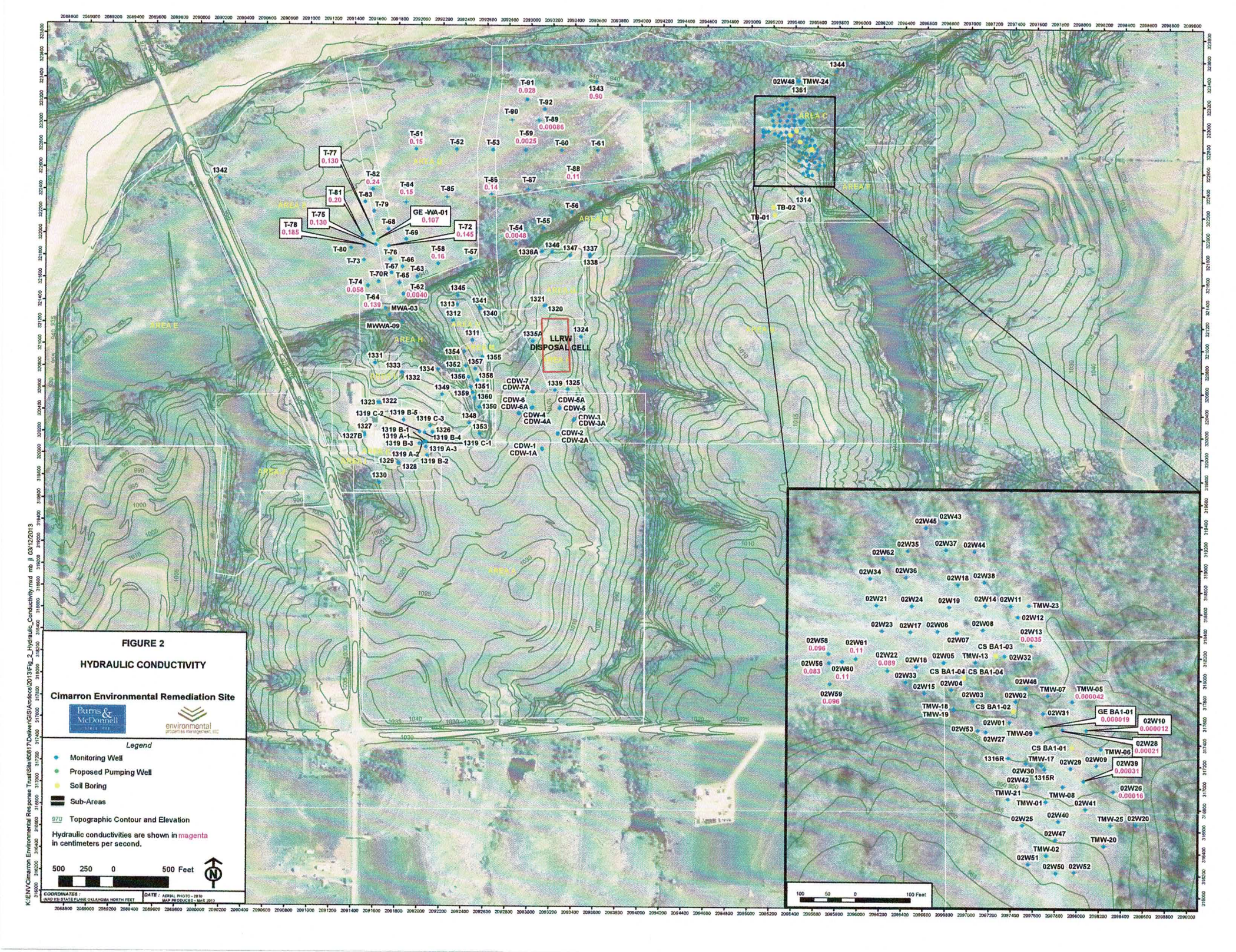


FIGURE 2
HYDRAULIC CONDUCTIVITY
Cimarron Environmental Remediation Site
Burns & McDonnell
environmental properties management, llc
Legend
Monitoring Well
Proposed Pumping Well
Soil Boring
Sub-Areas
970 Topographic Contour and Elevation
Hydraulic conductivities are shown in magenta in centimeters per second.
500 250 0 500 Feet
COORDINATES : (NAD 83) STATE PLANE OKLAHOMA NORTH FEET
DATE : AERIAL PHOTO - 2010 MAP PRODUCED - MAR 2013
K:\ENV\Cimarron Environmental Response Trust\Site\60817\Deliver\GIS\Arcdocs\2013\Fig_2_Hydraulic_Conductivity.mxd mb @ 03/12/2013
AREA A
AREA B
AREA C
AREA D
AREA E
AREA F
AREA G
AREA H
AREA I
AREA J
LLRW DISPOSAL CELL
AREA 1
AREA 2
AREA 3
AREA 4
T-77 0.130
T-75 0.130
T-78 0.185
T-81 0.20
T-82 0.24
T-84 0.15
T-51 0.15
T-91 0.028
T-89 0.00086
T-59 0.0025
T-88 0.11
T-54 0.0048
T-74 0.058
T-64 0.139
T-62 0.0040
T-58 0.16
T-72 0.145
GE -WA-01 0.107
1319 C-2
1319 B-5
1319 C-3
1319 B-1
1319 A-1
1319 B-3
1319 A-3
1319 A-2
1319 B-2
1319 B-4
1319 C-1
1327B
MWA-03
MWWA-09
CDW-7
CDW-7A
CDW-6
CDW-6A
CDW-4
CDW-4A
CDW-5A
CDW-5
CDW-3
CDW-3A
CDW-2
CDW-2A
CDW-1
CDW-1A
02W48
TMW-24
02W43
02W45
02W35
02W37
02W44
02W62
02W34
02W36
02W18
02W38
02W21
02W24
02W19
02W14
02W11
TMW-23
02W12
02W23
02W17
02W06
02W08
02W13 0.0035
02W58 0.096
02W61 0.11
02W07
CS BA1-03
02W56 0.083
02W60 0.11
02W22 0.089
02W16
02W05
TMW-13
02W32
02W33
CS BA1-04
02W15
02W04
02W46
TMW-07
TMW-05 0.000042
02W59 0.096
02W03
02W02
TMW-18
TMW-19
CS BA1-02
02W31
GE BA1-01 0.000019
02W10 0.000012
02W01
02W53
TMW-09
02W27
02W28 0.00021
CS BA1-01
TMW-06
1316R
TMW-17
02W29
02W09
02W39 0.00031
02W30
1315R
02W42
02W26 0.00016
TMW-21
TMW-08
TMW-01
02W41
02W25
02W40
TMW-25
02W20
02W47
TMW-20
TMW-02
02W51
02W50
02W52
100 50 0 100 Feet

ATTATCHMENT 2
Tables

TABLE 1
PNEUMATIC SLUG TEST WELL DATA
CIMARRON ENVIRONMENTAL RESPONSE TRUST
CRESCENT, OK

Well	Test Date	Static Water Level (Ft BTOC)	Stick Up (Ft)	Well TD (Ft BTOC)	Depth to Screen (Ft BTOC)	Screen Length (Ft)	Borehole Radius (Ft)	Casing/Screen Radius (Ft)	Filter Sand	Packer Length (Ft)	Packer Radius (Ft)	Packer Tubing IR (Ft)	Transducer Radius (Ft)	Transducer Length (Ft)	Transducer Cable Radius (Ft)	Top of Packer (Ft BTOC)	Depth to Transducer (Ft BTOC)	Static Water Column Height (Ft)	Saturated Thickness (Ft)
T51	2/6/2013	11.42	2.5	22.05	7.5	15	0.3646	0.0833	10/20	2	0.075	0.02083	0.015	0.28	0.01	13	14.5	10.63	10.63
T54	2/7/2013	10.85	2.65	17.39	8.65	10	0.3646	0.0833	10/20	2	0.075	0.02083	0.015	0.28	0.01	13	14.5	6.54	6.54
T58	2/6/2013	10.52	2.97	22.94	7.97	15	0.3646	0.0833	10/20	2	0.075	0.02083	0.015	0.28	0.01	12	13.58	12.42	12.42
T59	2/7/2013	9.48	2	29.64	9	10	0.3646	0.0833	NA	2	0.075	0.02083	0.015	0.28	0.01	12	13.5	20.16	20.16
T62	2/7/2013	11.69	1.98	22.18	6.78	15	0.3646	0.0833	10/20	2	0.075	0.02083	0.015	0.28	0.01	14	15.5	10.49	10.49
T74	2/6/2013	12.04	3.1	34.79	14.6	20	0.3646	0.0833	10/20	NA	NA	NA	NA	NA	NA	NA	13.5	22.75	22.75
T81	2/6/2013	10.35	2.1	30.15	10.1	20	0.3646	0.0833	10/20	2	0.075	0.02083	0.015	0.28	0.01	14	14.6	19.8	19.8
T82	2/7/2013	11.72	2.5	31.55	10.5	20	0.3646	0.0833	10/20	2	0.075	0.02083	0.015	0.28	0.01	14	15.5	19.83	19.83
T84	2/6/2013	10.31	2.75	30.11	5.75	25	0.3438	0.0833	20/40	2	0.075	0.02083	0.015	0.28	0.01	12	13.55	19.8	19.8
T86	2/7/2013	10.28	2.87	30.21	4.87	25	0.3438	0.0833	20/40	2	0.075	0.02083	0.015	0.28	0.01	12	13.5	19.93	19.93
T88	2/6/2013	10.48	3.08	30.47	5.58	25	0.3438	0.0833	20/40	2	0.075	0.02083	0.015	0.28	0.01	12	13.58	19.99	19.99
T89	2/7/2013	10.74	2.9	34.6	9.4	25	0.3438	0.0833	20/40	2	0.075	0.02083	0.015	0.28	0.01	12	13.5	23.86	23.86
T91	2/7/2013	9.72	1.74	30.11	8.74	20	0.25	0.0833	20/40	2	0.075	0.02083	0.015	0.28	0.01	12	13.5	20.39	20.39
1343	2/7/2013	13.62	1.5	25.59	10	15	0.3333	0.0833	NA	2	0.075	0.02083	0.015	0.28	0.01	15	16.5	11.97	11.97

Notes:
Ft - Feet
Ft BTOC - Below Top of Casing
NA - Not available/Not Applicable

Table 2
Peumatic Slug Test Results
Cimarron Environmental Response Trust
Crescent, OK

Well	Saturated Thickness (ft)	Solution	Hydaulic Conductivity (cm/sec)
T51	10.63	Springer-Gelhar (1991)	$1.5X10^{-1}$
T54	6.54	Hvorslev (1951)	$4.8X10^{-3}$
T54	6.54	Springer-Gelhar (1991)	$3.2X10^{-3}$
T58	12.42	Springer-Gelhar (1991)	$1.6X10^{-1}$
T59	20.16	Springer-Gelhar (1991)	$2.5X10^{-3}$
T59	20.16	Hvorslev (1951)	$3.3X10^{-3}$
T62	10.49	Springer-Gelhar (1991)	$4.0X10^{-3}$
T62	10.49	Hvorslev (1951)	$5.2X10^{-3}$
T74	22.75	Springer-Gelhar (1991)	$5.8X10^{-2}$
T81	19.8	Springer-Gelhar (1991)	$2.0X10^{-1}$
T82	19.83	Springer-Gelhar (1991)	$2.4X10^{-1}$
T84	19.8	Springer-Gelhar (1991)	$1.5X10^{-1}$
T86	19.93	Springer-Gelhar (1991)	$1.4X10^{-1}$
T88	19.99	Springer-Gelhar (1991)	$1.1X10^{-1}$
T89*	23.86	Hvorslev (1951)	$8.6X10^{-4}$
T89*	23.86	Springer-Gelhar (1991)	$1.1X10^{-3}$
T91	20.39	Springer-Gelhar (1991)	$2.8X10^{-2}$
1343	11.97	Springer-Gelhar (1991)	$9.0X10^{-1}$

Notes:
Shaded area indicates primary solution
* Indicates potentially erroneous data
ft = feet
cm/sec = centimeters per second

ATTACHMENT 3
Field Notes

65944

02/04/13 CERT BMP OLAR — P. HIGGINS M. CRAWFORD

1130 ARRIVE ONSITE

FORECAST: HIGH LOW 60's, CLEAR SKIES WINDS 10-20 N

~~PERSONNEL~~

PERSONNEL: M. CRAWFORD, P. HIGGINS

TASK: PNEUMATIC SLUG TESTS

1135 SITE & SAFETY ORIENTATION W/ J. LUX

1200 OFFSITE FOR LUNCH

1250 ONSITE

1300 SETTING UP TO TAKE INITIAL WL's

1307 T-74 WL = 12.08' BTOC

NOTE T-80 APPEARS TO BE PLUGGED; ADDING T-81 TO REPLACE T-80

1315 T-81 WL = 10.39' BTOC

1322 T-82 WL = 11.75' BTOC

1327 T-51 WL = 11.45' BTOC

1330 T-52 WL = 10.23' BTOC

1336 T-59 WL = 9.49 BTOC

1339 T-89 WL = 10.78' BTOC

1343 T-91 WL = 9.74' BTOC

1347 T-61 WL = 9.65' BTOC

1352 #1343 WL = 13.64' BTOC

1400 T-87 WL = 10.08' BTOC

X X X X X X X

65944

02/04/13 CERT BMP OLAR — P. HIGGINS M. CRAWFORD

1405 T-57 WL = 10.01' BTOC

1411 T-63 WL = 11.15' BTOC

1416 T-75 WL = 10.50' BTOC

NOTE T-75 HAS NO LOCK

*LATE ENTRY WELL #1343 ON MAPS LABLED 1342 ON WELL CAP

1422 T-84 WL = 10.34' BTOC

1428 PICKING UP PACKER AT MAIN BUILDING

~~1523~~ & LOOKING INTO HOW TO SET IT UP

1523 SETTING UP TO CONDUCT PNEUMATIC SLUG TEST AT T-52

1601 UNABLE TO CODUCT TEST DUE TO LACK OF EQUIPMENT; UNABLE TO LOOSEN PROBE ROD FITTING FROM PNEUMATIC SLUG TEST APARATUS;

1620 TALKING W/ LARRY ABOUT HOW TO REMOVE PROBE ROD FITTING & WHERE TO GET PLUMING PIPE & FITTINGS NEEDED FOR SLUG TESTING W/ PACKER

1636 L. MORGAN IS TAKING SLUG TEST MANIFOLD BLOCK TO LOCAL FARMERS TO USE A VISE TO REMOVE PROBE ROD FITTING

1700 L. MORGAN GOT PROBE ROD FREE OF MANIFOLD; OFFSITE FOR DAY

2/4/13

65944 P.HIGGINS
02/05/13 CERT BMcDLAR M.CRAWFORD
0813 ARRIVE ONSITE
FORECAST: MID 60's, CLEAR SKIES, WEST WINS 5-10 MPH
PERSONNEL: P.HIGGINS, M.CRAWFORD; ALSO ONSITE L.MORGAN, J.LUX
TASK: PNEUMATIC SLUG TESTING
0815 SAFETY MEETING
*LATE ENTRY STOPPED AT LOWES TO GET PIPE TO RUN PACKERS
0830 LOADING EQUIPMENT
0910 SET UP TO CONDUCT PNEUMATIC SLUGTEST
0912 T-52 WL = 10.21' BTOC
0926 TRANSDUCER IS PLACED ≈ 17.3' BGS
1000 SETTING UP DATALOGGER SOFTWARE
1026 UNABLE TO GET TRANSDUCER TO READ; GOING BACK TO FIELD OFFICE TO CALL GEOPROBE
1100 CALLED GEOPROBE & WAS GIVEN INSTRUCTIONS ON HOW TO INSTALL DRIVER FOR SERIAL TO USB ADAPTOR
1115 CHARGING LAP TOPS & RESEARCHING WELL CONSTRUCTION OF T-81 & #1343
1245 STILL UNABLE TO COMUNICATE WELL TRANSDUCER
1316 TRANSDUCER ZEROED AND STABLE

65944 P. HIGGINS
02/05/13 (Cont.) CERT BMcDLAR M.CRAWFORD
1320 SECURE XD CABLE
1350 UNABLE TO SEAL APPARATUS ONTO 2" CASING
1357 DISCOVERED HOLE IN CASING; REPOSITIONED HOSE CLAMP TO COVER
1446 UNABLE TO SEAL WELL; WILL BE MOVING ON TO ANOTHER WELL & USE PACKER TO TEST T-52
1450 T-52 WL = 10.20' BGS
1458 T-74 WL = 12.03' BGS
1500 SETTING UP TO CONDUCT PNEUMAIC SLUG TEST AT T-74
1530 PERFORMED THREE SLUG TESTS AT T-74; RETURNING TO FIELD OFFICE TO LOOK AT DATA
1730 GATHERING EQUIPMENT BACK TO FIELD OFFICE
1745 OFFSITE

2/5/13

P. HIGGINS
02/06/13 CERT BM.D LAR 65944 M. CRAWFORD
0810 ARRIVE ONSITE
FORECAST: HIGH MID 60's, AM FOG, PM CHANCE OF RAIN; PARTLY CLOUDY WINDS SOUTH 10-15 MPH
PERSONNEL: M. CRAWFORD, P. HIGGINS ALSO ONSITE J. LUX, L. MORGAN
TAST: PNEUMATIC SLUG TESTING
0825 SAFETY MEETING
0828 RESEARCHING WELL CONSTRUCTION & EVALUATING WHAT WELLS TO TEST AT THE FIELD OFFICE
0945 LOADING GEAR FOR TESTING
1002 SETTING UP FOR PNEUMATIC SLUG TEST ON T-74
1005 6.2' FROM GS TO TOP OF SLUG TEST MANIFOLD
1011 T-74 WL = 12.04' BTOC
1029 COMPLETED SLUG TESTS AT T-74
FILE SAVED AS T74-2
TEST 1 @ ≈ 40 in H_2O
TEST 2 @ ≈ 31-32 in H_2O
TEST 5 @ ≈ 50 in H_2O DROPPED TO 43 PSI BEFORE RELEASING PRESSURE
1043 T74 T.D. = 34.79' BTOC
1053 SETTING UP FOR SLUG TESTS AT T-81

P. HIGGINS
02/06/13 CERT BM.D LAR 65944 M. CRAWFORD
1056 T-81 STICK UP = 1.86'
*LATE ENTRY T-74 STICK UP = 2.6'
1057 T-81 WL = 10.34' BTOC
1102 T-81 TD = 30.15' BTOC
NOTE SCREEN IS 10.1' BTOC
1156 TOP OF PACKER SET AT 10' BTOC
1159 PACKER PRESSURIZED TO 70 PSI
TRANSDUCER CABLE RADIUS = 0.01'
TRANSDUCER RADIUS = 0.015'
TRANSDUCER LENGTH = 0.28'
1211 TOP OF SLUG TEST MANIFOLD = 2.8' ABOVE TOC; TRANSDUCER SET 14.8' B TOP OF MANIFOLD
1215 LOG T81 ZEROING
1215 LOG T81 ERROR
1220 ZEROING LOG T81
1225 LOG T81 ZEROED; RUNNING SLUG TESTS AT ≈ 20 PSI in H_2O
1232 STOPPED LOGGING ADDRESSING LEAKS
1300 WELL NOT HOLDING PRESSURE RAISE TOP OF PACKER TO 9.5' BTOC; LOWER TRANSDUCER AT 14.3' B TOP OF MANIFOLD
1306 LOGGER NOW SHOWS 5.15' OF HEAD

P. HIGGINS

2/6/13 CERT BMLD LAR ~~#~~ 65944 M. CRAWFORD

1306 ZEROING LOG T81-2 AS 5.15' OF HEAD IS ERRONEOUS

1312 RUN SLUG TEST T81-2 W/ ≈ 15 in H_2O & PACKER SET W/ 40 PSI

1318 LOWERING PACKER TO 10.5' BTOC TRANSDUCER AT 15.3' BTOP OF MANIFOLD

1323 ZEROING LOG T81-3 AS 6.15' OF HEAD IS ERRONEOUS

1325 SET PACKER W/ 40 PSI

1334 T81-3 WELLS PRESSURIZED TO 30 in H_2O THEN ~~FRO~~ DROPPED & STABALIZED AT ≈ 26.5 in H_2O AT WHICH TIME ~~SLUG TEST~~ PRESSURE WAS RELEASED ON TESTS 1-3

1342 LOWERING PACKER TO 12' BTOC & TRANSDUCER TO 16.8' BTOC SET PACKER W/ 40 PSI

1344 ZEROING TRANSDUCER FOR LOG T81-4

* LATE ENTRY DURING T81-3 TESTS GURGLING SOUND HEARED WHEN PRESSURIZING

1350 1357 TESTS 1-3 T81-4 PRESSURIZED TO ≈ 46 in H_2O 3 HEARD SOUND OF H_2O DRAINING INTO WELL

X X X X X X X X X X X X X

P. HIGGINS

2/6/13 CERT BMLD LAR 65944 M. CRAWFORD

1415 PACKER LOWERED TO 14' FROM TOC TO TOP OF PACKER

TRANSDUCER SET AT ≈ 15.8' BTOP OF MANIFOLD

1420 PACKER SET AT 40 PSI

1421 ZEROING TRANSDUCER FOR LOG T81-5

TRANSDUCER LOWERED TO APPROX. 17.4' B TOP OF MANIFOLD

1440 STOP SLUG TESTING AT T-81

T81-5 TEST 1-3 AT ≈ 57-58 in H_2O

TEST 5 AT ≈ 48 in H_2O

ON TEST 5 PRESSURE SLOWLY BLED DOWN TO 48 in H_2O AT WHICH POINT PRESSURE WAS RELEASED

1450 T81 W.L. = 10.35' BTOC

1459 T84 W.L = 10.31' BTOC

1502 T84 T.D. = 30.11' BTOC

1505 T84 Stickup = 2.75'

Top of screen = 5.75' BTOC (per Const. diagram and field measurement of stickup)

W.L. = 4.56' below top of screen.

1529 PACKER SET AT 12' BTOC W/ CTOPOFPACKER 40 PSI; TRANSDUCER SET AT 13.55' BTOC

X X X X X X X X X X X X X

P. HIGGINS

2/6/13 CERT BMCO LAR 65944 M. CRAWFORD

1539 ZEROING TRANSDUCER FOR LOG T84

1548 ~~FO~~ COMPLETE SLUG TESTS AT T84 WELL PRESSURES BETWEEN 46 & 46S IN H_2O

1604 T-51 WL = 11.42' BTOC
T-51 T.D. = 22.05' BTOC

1618 SET TOP OF PACKER AT 13' BTOC ON T-51 W/ 40 PSI
TRANSDUCER SET AT 14.5' BTOC

1621 ZEROING TRANSDUCER AT T-51

1641 WELL NOT HOLDING PRESSURE
REZERO ING TRANSDUCER

1649 COMPLETE SLUG TESTS AT T-51
WELL PRESSURIZED TO ≈ 44 IN H_2O

1708 T58 W.L. = 10.52' BTOC
T58 T.D. = 22.94' BTOC
T58 Stickup = 2.97'

1715 PACKER TOP IS AT 12' BTOC
AND SET W/ 40 PSI
TRANSDUCER = ~~13.5' BTOC~~ 13.58' BTOC

1724 ZEROING TRANSDUCER AT T-58

1739 COMPLETE SLUG TES T-58
TESTS 1 & 4 PRESSURIZED TO 42.5 in H_2O
TESTS 2 & 3 PRESSURIZED TO 46 IN H_2O

1755 T88 W.L = 10.48' BTOC

P. HIGGINS

2/6/13 CERT BMCO LAR 65944 M. CRAWFORD

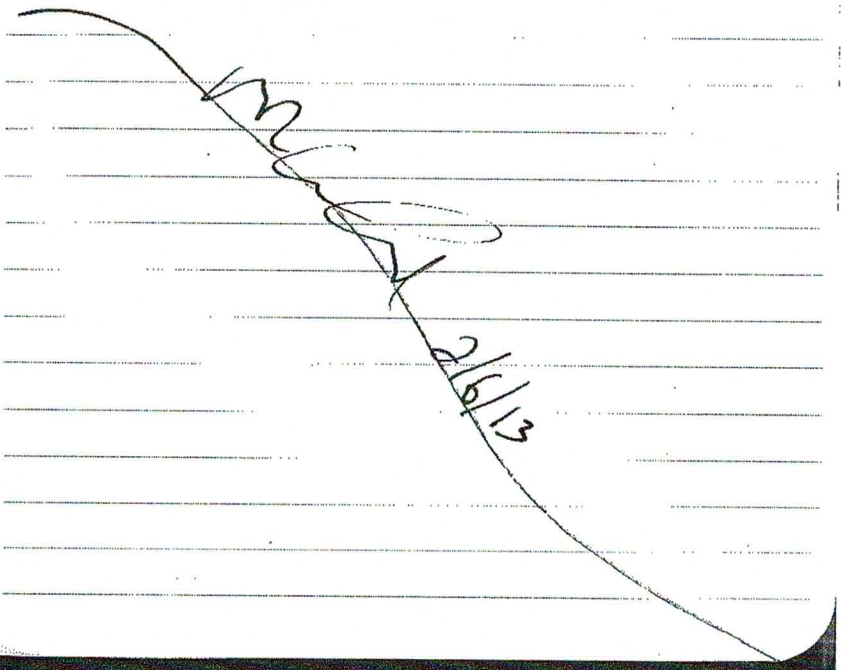
1800 T88 TD = 30.47 BTOC
SIT88 Stickup = 3.08'

1802 TOP OF PACKER SET AT 12' BTOC W/ 40 PSI ; TRANSDUCER SET AT 13.58' BTOC ; T-88

1808 ZEROING TRANSDUCER AT T-88

1820 COMPLETED SLUG TEST AT T-88 PRESSURIZED WELL TO 43 IN H_2O ON ALL THREE TESTS ; LOADING EQUIPMENT & MOVING IT BACK TO FIELD OFFICE

1845 OFFSITE



P. HIGGINS

02/07/13 CERT BMcD LAR 65944 M. CRAWFORD
0755 ARRIVE ONSITE
FORECAST: HIGH UPPER 50's, RAIN, WINDS NORTH 15-20
PERSONNEL: M. CRAWFORD, P. HIGGINS
TASK: PNEUMATIC SLUG TESTING
0810 SAFETY MEETING
0815 LOAD EQUIPMENT
0824 SET UP FOR SLUG TEST AT 1343
1343 WL = 13.62' BTOC
1343 TD = 25.59' BTOC
STICK UP = 1.63' (MEASURED)
STICKUP = 1.5' FROM CONSTRUCTION DIAGRAM
0844 PACKER SET AT ~~14'~~ 15' BTOC w/ 40 PSI
TRANSDUCER SET AT 16.5' BTOC
0917 ZEROING TRANSDUCER @ 1343
0930 COMPLETE 1343 SLUG TEST
WELL PRESSURE = 43 IN H_2O FOR ALL THREE TESTS
0935 1343 W.L. = 13.61' BTOC
0943 SETUP TO CONDUCT SLUG TESTS AT T-91
0945 T91 W.L. = 9.72' BTOC
T91 TD = 30.11' BTOC
T91 Stickup = 1.74'
1000 T-91: PACKER SET AT 12' ~~BGS~~ BTOC w/ 40 PSI; TRANSDUCER SET AT 13.5' BTOC

P. HIGGINS

02/07/13 CERT BMcD LAR 65944 M. CRAWFORD
1005 ZEROING TRANSDUCER AT T-91
1014 COMPLETE T-91 SLUG TESTS
WELL PRESSURE = 51 IN H_2O FOR ALL THREE TESTS
1024 SETUP TO CONDUCT SLUG TEST AT T-89
1026 T-89 WL = 10.74' BTOC
TD = 34.60' BTOC
STICK UP = ~~2.9'~~ 2.9'
1034 SET PACKER AT ~~13' BGS~~ w/ 40 PSI
TRANSDUCER SET AT 14.5' BTOC
1039 ZEROING TRANSDUCER AT T-89
1045 PACKER WAS ACTUALLY SET AT 12' BGS
1055 RESETTING TRANSDUCER TO 13.5' BTOC
1155 COMPLETE SLUG TEST AT T-89
WELL PRESSURE = ~~44~~ 43 IN H_2O
ON FIRST TEST 51 IN H_2O ON TESTS 2-4
1103 SET UP FOR SLUG TESTS AT T-59
1105 T-59 WL = 9.48' BTOC
TD = 29.64' BTOC
STICK UP = 2.16'
1111 PACKER SET AT 12' BTOC w/ 40 PSI
TRANSDUCER SET AT 13.5' BTOC
1115 ZEROING TRANSDUCER FOR T-59

P. HIGGINS

02/07/13 CERT BMCO LAR 65944 M. CRAWFORD

1127 COMPLETE SLUG TESTS AT T-59
VALVE WAS NOT SEALED ON TEST 1
TEST 2 & 3 WELL PRESSURE = 56 IN H_2O
TEST 4 WELL PRESSURE = 59 IN H_2O

1137 SET UP FOR SLUG TESTS AT T-86

1140 T-86 WL = 10.28' BTOC
TD = 30.21' BTOC
STICK UP = 2.87'

1145 PACKER SET AT ~~13~~ 12' BTOC W/ 40 PSI
TRANSDUCER SET AT 13.5' BTOC

1152 ZEROING TRANSDUCER AT T-86

1204 COMPLETE SLUG TESTS AT T-86
TEST 1 & 2 WELL PRESSURE = 46 IN H_2O
TEST 3 WELL PRESSURE = 49 IN H_2O

1216 SET UP FOR SLUG TEST AT T-54

1219 T-54 WL = 10.85'
TD = 17.39'
STICK UP = 2.65

1227 PACKER SET AT 13' BTOC W/ 40 PSI
TRANSDUCER SET AT 14.5' BTOC

1230 ZEROING TRANSDUCER AT T-54

1240 COMPLETE SLUG TESTS AT T-54
WELL PRESSURE = 53 PSI ON ALL
THREE TESTS

1253 SETUP FOR SLUG TESTS AT T-82

P. HIGGINS
M. CRAWFORD

02/07/13 CERT BMCO LAR 65944

1254 T-82 WL = 11.72' BTOC
TD = 31.55' BTOC
STICK UP = ~~2.27~~ 2.17'

1302 SET PACKER AT 14' BTOC W/ 40 PSI
TRANSDUCER SET AT 15.5' BTOC

1306 ZEROING TRANSDUCER AT T-82

1317 COMPLETE SLUG TESTS AT T-82
WELL PRESSURE = 51 IN H_2O FOR ALL
TESTS

1328 SETUP FOR SLUG TEST OF T-62

1330 T-62 WL = 11.69' BTOC
TD = 22.18' BTOC
STICK UP = 1.98'

1336 SET PACKER AT 14' BTOC W/ 40 PSI
TRANSDUCER SET AT 15.5' BTOC

* LATE ENTRY ALL EQUIPMENT DECONNED
AFTER EACH WELL

1341 ZEROING TRANSDUCER AT T-62

1350 COMPLETE SLUG TESTS AT T-62
WELL PRESSURE = 54 PSI FOR ALL
TESTS

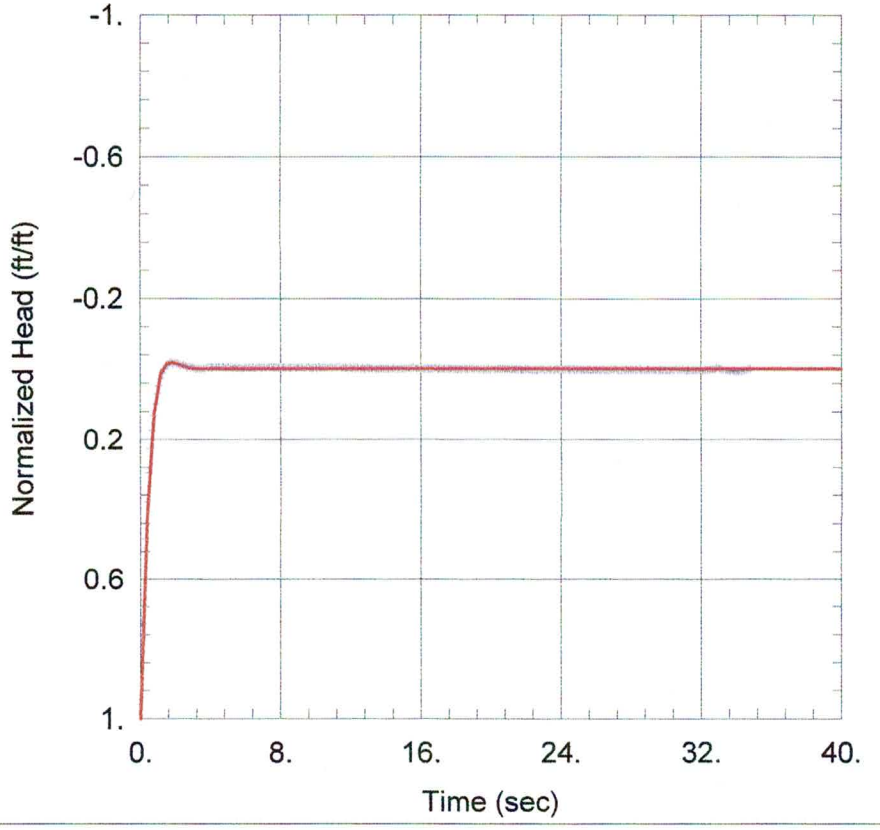
1355 DECONNING EQUIPMENT

1405 RETURNING TO FIELD OFFICE TO
UNLOAD EQUIPMENT

1449 OFFSITE

2/7/13

ATTACHMENT 4
Slug Test Data and Solutions



PNEUMATIC SLUG TEST

Data Set: K:\USERS\M_CRAW\Geology_Hydro\Slug Tests\T51_Test1.aqt
Date: 02/12/13 Time: 13:57:04

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T51
Test Date: 02/06/13

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 417. ft/day
Le = 0.1096 ft

AQUIFER DATA

Saturated Thickness: 10.63 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T51)

Initial Displacement: 2.85 ft
Total Well Penetration Depth: 18.58 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 10.63 ft
Screen Length: 15. ft
Well Radius: 0.0833 ft

Data Set: K:\USERS\M_CRAW\Geology_Hydro\Slug Tests\T51_Test1.aqt
Title: Pneumatic Slug Test
Date: 02/13/13
Time: 16:47:54

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/06/13
Test Well: T51

AQUIFER DATA

Saturated Thickness: 10.63 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T51

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.85 ft
Static Water Column Height: 10.63 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 15. ft
Total Well Penetration Depth: 18.58 ft

No. of Observations: 349

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.851	17.5	0.
0.1	2.085	17.6	-0.00319
0.2	1.885	17.7	-0.00319
0.3	1.378	17.8	0.
0.4	1.078	17.9	0.
0.5	0.8418	18.	0.
0.6	0.6441	18.1	0.
0.7	0.4942	18.2	0.
0.8	0.3731	18.3	0.00319
0.9	0.2806	18.4	-0.00319
1.	0.1945	18.5	-0.00319
1.1	0.1339	18.6	0.00319
1.2	0.07652	18.7	0.
1.3	0.03188	18.8	-0.00319
1.4	0.00319	18.9	0.
1.5	-0.02551	19.	0.
1.6	-0.03508	19.1	0.00319
1.7	-0.04783	19.2	0.
1.8	-0.05421	19.3	0.
1.9	-0.04465	19.4	0.00319
2.	-0.04783	19.5	0.00319
2.1	-0.04465	19.6	0.00319
2.2	-0.03827	19.7	0.00319
2.3	-0.0287	19.8	0.00319
2.4	-0.03189	19.9	0.
2.5	-0.0287	20.	0.00637
2.6	-0.02232	20.1	-0.00319
2.7	-0.01276	20.2	0.00637
2.8	-0.01595	20.3	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.00957	20.4	0.00319
3.	-0.00957	20.5	0.
3.1	-0.00638	20.6	0.
3.2	-0.00319	20.7	0.
3.3	-0.00319	20.8	0.00319
3.4	-0.00319	20.9	0.00319
3.5	0.	21.	0.00319
3.6	-0.00319	21.1	0.
3.7	0.	21.2	0.00319
3.8	-0.00638	21.3	0.00319
3.9	-0.00957	21.4	0.00319
4.	-0.01276	21.5	0.
4.1	-0.00957	21.6	0.00319
4.2	-0.01595	21.7	0.
4.3	-0.01595	21.8	0.00637
4.4	-0.01595	21.9	0.00637
4.5	-0.01595	22.	0.
4.6	-0.01276	22.1	0.
4.7	-0.01276	22.2	0.00319
4.8	-0.01276	22.3	0.00319
4.9	-0.00957	22.4	0.00637
5.	-0.01276	22.5	0.00637
5.1	-0.00957	22.6	0.00637
5.2	-0.01276	22.7	0.00637
5.3	-0.00957	22.8	0.00319
5.4	-0.01595	22.9	0.00319
5.5	-0.01276	23.	0.00319
5.6	-0.00957	23.1	0.00637
5.7	-0.00957	23.2	0.00637
5.8	-0.00638	23.3	0.00319
5.9	-0.00957	23.4	0.00319
6.	-0.01276	23.5	0.00319
6.1	-0.00957	23.6	0.00637
6.2	-0.00957	23.7	0.00637
6.3	-0.00957	23.8	0.00319
6.4	-0.00957	23.9	0.00319
6.5	-0.00957	24.	0.00319
6.6	-0.00638	24.1	0.00319
6.7	-0.01276	24.2	0.00319
6.8	-0.01276	24.3	0.00319
6.9	-0.00638	24.4	0.
7.	-0.00957	24.5	0.00637
7.1	-0.01276	24.6	0.00319
7.2	-0.00638	24.7	0.00319
7.3	-0.01276	24.8	0.00637
7.4	-0.00957	24.9	0.00637
7.5	-0.01276	25.	0.00319
7.6	-0.00957	25.1	0.00319
7.7	-0.00957	25.2	0.00637
7.8	-0.00957	25.3	0.00319
7.9	-0.00957	25.4	0.00637
8.	-0.00957	25.5	0.00637
8.1	-0.00638	25.6	0.00637
8.2	-0.00957	25.7	0.00637
8.3	-0.00957	25.8	0.00956
8.4	-0.00638	25.9	0.00319
8.5	-0.00638	26.	0.00637
8.6	-0.00638	26.1	0.00637
8.7	-0.00957	26.2	0.00637
8.8	-0.00957	26.3	0.00637
8.9	-0.00638	26.4	0.00319
9.	-0.00957	26.5	0.00637
9.1	-0.00638	26.6	0.00637
9.2	-0.01276	26.7	0.00637
9.3	-0.00638	26.8	0.00637
9.4	-0.00957	26.9	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00957	27.	0.00319
9.6	-0.01276	27.1	0.00319
9.7	-0.00957	27.2	0.00637
9.8	-0.00319	27.3	0.00637
9.9	-0.00638	27.4	0.00637
10.	-0.01276	27.5	0.00319
10.1	-0.00638	27.6	0.00637
10.2	-0.01276	27.7	0.00637
10.3	-0.00957	27.8	0.00637
10.4	-0.00638	27.9	0.00637
10.5	-0.00638	28.	0.00637
10.6	-0.00957	28.1	0.00319
10.7	-0.00957	28.2	0.00956
10.8	-0.00638	28.3	0.00637
10.9	-0.00638	28.4	0.00637
11.	-0.00957	28.5	0.00319
11.1	-0.00957	28.6	0.00637
11.2	-0.00957	28.7	0.00956
11.3	-0.00957	28.8	0.00637
11.4	-0.01276	28.9	0.00637
11.5	-0.00319	29.	0.00319
11.6	-0.00638	29.1	0.00637
11.7	-0.00638	29.2	0.00956
11.8	-0.00638	29.3	0.00637
11.9	-0.00319	29.4	0.00956
12.	-0.00957	29.5	0.00637
12.1	-0.00319	29.6	0.00637
12.2	-0.00638	29.7	0.00637
12.3	-0.00319	29.8	0.00637
12.4	-0.00638	29.9	0.00956
12.5	-0.00319	30.	0.00637
12.6	0.	30.1	0.00956
12.7	-0.00638	30.2	0.00637
12.8	-0.00319	30.3	0.00956
12.9	-0.00319	30.4	0.00956
13.	-0.00638	30.5	0.00956
13.1	-0.00319	30.6	0.
13.2	-0.00319	30.7	0.00956
13.3	0.	30.8	0.00319
13.4	-0.00319	30.9	0.00956
13.5	0.	31.	0.00319
13.6	0.	31.1	0.00956
13.7	-0.00638	31.2	0.01594
13.8	-0.00319	31.3	0.00637
13.9	-0.00319	31.4	0.00956
14.	-0.00319	31.5	0.00956
14.1	-0.00319	31.6	0.00956
14.2	-0.00319	31.7	0.00956
14.3	-0.00319	31.8	0.00637
14.4	0.	31.9	0.00637
14.5	-0.00319	32.	-0.00319
14.6	-0.00319	32.1	0.01275
14.7	0.	32.2	0.00637
14.8	-0.00319	32.3	0.00637
14.9	-0.00319	32.4	0.00956
15.	0.	32.5	0.00319
15.1	-0.00319	32.6	0.00319
15.2	0.	32.7	0.00319
15.3	-0.00319	32.8	0.
15.4	-0.00319	32.9	-0.01276
15.5	-0.00319	33.	-0.00957
15.6	-0.00638	33.1	-0.00319
15.7	-0.00319	33.2	0.
15.8	0.	33.3	0.00956
15.9	-0.00319	33.4	0.00956
16.	-0.00319	33.5	0.00956

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	0.	33.6	0.00956
16.2	0.	33.7	0.01275
16.3	-0.00319	33.8	0.00956
16.4	-0.00319	33.9	0.01913
16.5	0.00319	34.	0.01913
16.6	-0.00319	34.1	0.01594
16.7	0.	34.2	0.01594
16.8	-0.00319	34.3	0.01594
16.9	-0.00957	34.4	0.00956
17.	0.	34.5	0.01275
17.1	0.	34.6	0.00637
17.2	0.	34.7	0.00319
17.3	0.	34.8	0.
17.4	0.		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.102

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	417.	ft/day
Le	0.1096	ft

K = 0.1471 cm/sec
T = K*b = 4433. ft²/day (47.67 sq. cm/sec)
Le = 0.1096 ft
Solution is critically damped when C(D) = 1.

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	14.04	0.09684	+/- 0.1905	145.	ft/day
Le	0.1	0.0412	+/- 0.08104	2.427	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

K = 0.004954 cm/sec
T = K*b = 149.3 ft²/day (1.605 sq. cm/sec)
Le = 0.1 ft
Solution is critically damped when C(D) = 1.

Parameter Correlations

	K	Le
K	1.00	-0.01
Le	-0.01	1.00

Residual Statistics

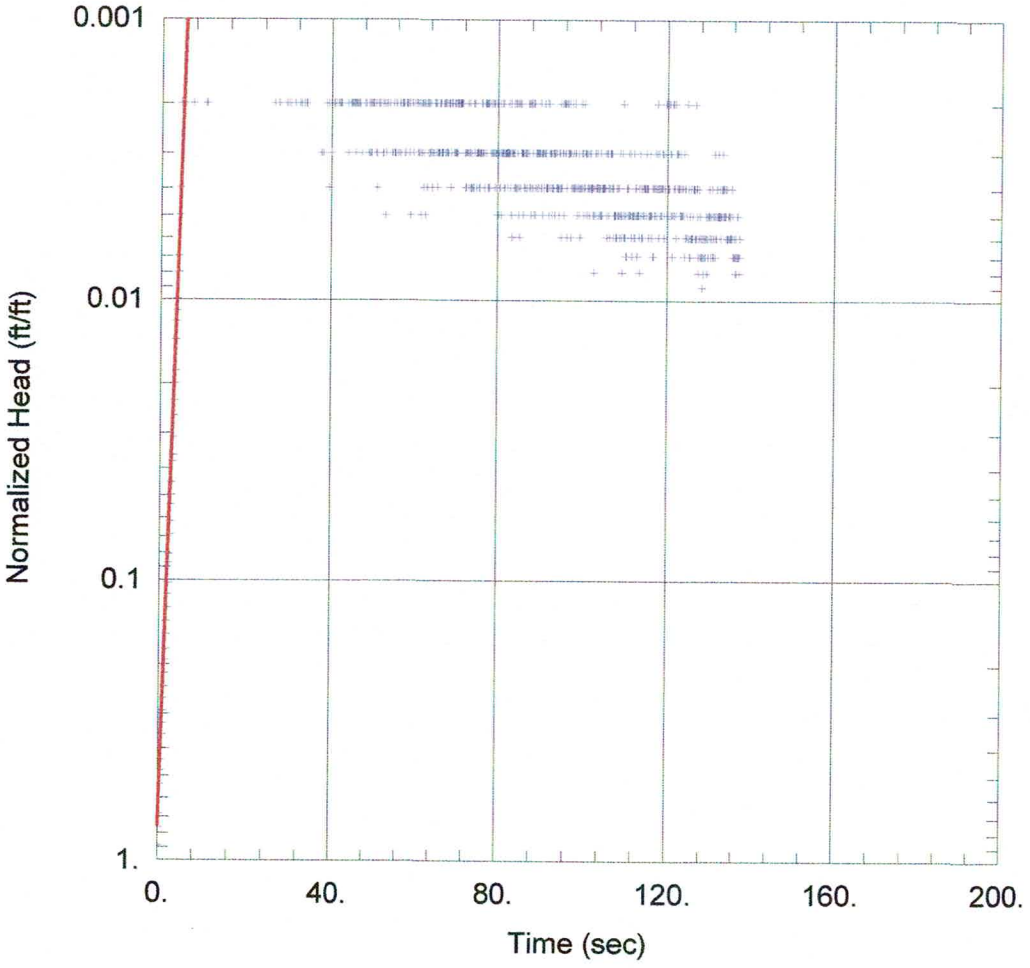
for weighted residuals

Sum of Squares . . . . . 0.1336 ft^2
Variance . . . . . 0.000385 ft^2
Std. Deviation . . . . . 0.01962 ft
Mean . . . . . -0.002936 ft

No. of Residuals. 349
No. of Estimates. 2

NOTES

Well Pressure = 44 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\USERS\M_CRAW\Geology_Hydro\Slug Tests\T54_Test3Hvorslev.aqt
Date: 02/13/13 Time: 16:50:44

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T54
Test Date: 02/07/13

AQUIFER DATA

Saturated Thickness: 6.54 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T54)

Initial Displacement: 3.21 ft
Total Well Penetration Depth: 14.15 ft
Casing Radius: 0.02083 ft
Static Water Column Height: 6.54 ft
Screen Length: 10. ft
Well Radius: 0.0833 ft

SOLUTION

Aquifer Model: Unconfined
K = 13.52 ft/day
Solution Method: Hvorslev
y0 = 2.414 ft

Data Set: K:\USERS\M_CRAW\Geology_Hydro\Slug Tests\T54_Test3Hvorslev.aqt
Title: Pneumatic Slug Test
Date: 02/13/13
Time: 16:51:56

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/13
Test Well: T54

AQUIFER DATA

Saturated Thickness: 6.54 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T54

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 3.21 ft
Static Water Column Height: 6.54 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 10. ft
Total Well Penetration Depth: 14.15 ft

No. of Observations: 1376

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	3.214	68.8	0.00957
0.1	2.828	68.9	0.00638
0.2	2.439	69.	0.00638
0.3	2.184	69.1	0.00319
0.4	1.92	69.2	0.00319
0.5	1.712	69.3	0.00319
0.6	1.531	69.4	0.00319
0.7	1.403	69.5	0.00957
0.8	1.275	69.6	0.00638
0.9	1.142	69.7	0.00957
1.	1.04	69.8	0.00638
1.1	0.9343	69.9	0.00957
1.2	0.845	70.	0.00957
1.3	0.7685	70.1	0.00638
1.4	0.6888	70.2	0.00957
1.5	0.6186	70.3	0.00957
1.6	0.5644	70.4	0.00638
1.7	0.5006	70.5	0.00638
1.8	0.4496	70.6	0.00638
1.9	0.4018	70.7	0.00319
2.	0.3603	70.8	0.00319
2.1	0.3284	70.9	0.00638
2.2	0.2774	71.	0.00638
2.3	0.2583	71.1	0.00638
2.4	0.22	71.2	0.00638
2.5	0.1977	71.3	0.00638
2.6	0.1722	71.4	0.00638
2.7	0.1594	71.5	0.00319
2.8	0.1435	71.6	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	0.1212	71.7	0.00319
3.	0.1148	71.8	0.
3.1	0.09885	71.9	0.00319
3.2	0.08291	72.	0.00319
3.3	0.07334	72.1	0.00957
3.4	0.06378	72.2	0.00957
3.5	0.0574	72.3	0.01276
3.6	0.04464	72.4	0.01276
3.7	0.03827	72.5	0.00957
3.8	0.03189	72.6	0.00957
3.9	0.03508	72.7	0.00319
4.	0.02232	72.8	0.00638
4.1	0.02551	72.9	0.00957
4.2	0.02232	73.	0.01276
4.3	0.02551	73.1	0.01276
4.4	0.01595	73.2	0.00957
4.5	0.01276	73.3	0.00638
4.6	0.00638	73.4	0.00957
4.7	0.00319	73.5	0.01276
4.8	0.00319	73.6	0.01276
4.9	0.00319	73.7	0.00957
5.	0.00638	73.8	0.01276
5.1	0.00638	73.9	0.00319
5.2	-0.00319	74.	0.01276
5.3	0.00638	74.1	0.00638
5.4	0.	74.2	0.01276
5.5	0.	74.3	0.00638
5.6	0.	74.4	0.00957
5.7	0.	74.5	0.00638
5.8	0.00319	74.6	0.00319
5.9	0.	74.7	0.
6.	0.	74.8	0.00957
6.1	0.	74.9	0.01276
6.2	0.	75.	0.00957
6.3	-0.00638	75.1	0.00957
6.4	-0.00638	75.2	0.00957
6.5	0.	75.3	0.00957
6.6	0.	75.4	0.00957
6.7	-0.00319	75.5	0.01276
6.8	-0.00319	75.6	0.01276
6.9	-0.00956	75.7	0.00957
7.	0.00319	75.8	0.00957
7.1	-0.00638	75.9	0.00957
7.2	-0.00319	76.	0.00957
7.3	-0.00319	76.1	0.00638
7.4	0.00638	76.2	0.00638
7.5	-0.00956	76.3	0.00957
7.6	0.00319	76.4	0.00319
7.7	0.	76.5	0.00957
7.8	-0.00319	76.6	0.00957
7.9	0.	76.7	0.00319
8.	0.	76.8	0.01276
8.1	-0.00638	76.9	0.00638
8.2	-0.00638	77.	0.00957
8.3	-0.00638	77.1	0.00638
8.4	-0.00319	77.2	0.00638
8.5	-0.00638	77.3	0.00957
8.6	-0.00638	77.4	0.00638
8.7	-0.00319	77.5	0.00638
8.8	0.	77.6	0.01276
8.9	-0.01275	77.7	0.00638
9.	0.	77.8	0.01276
9.1	-0.00319	77.9	0.00638
9.2	-0.00319	78.	0.01276
9.3	0.00319	78.1	0.
9.4	-0.00638	78.2	0.00957

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	0.	78.3	0.00319
9.6	-0.00638	78.4	0.00638
9.7	-0.00319	78.5	0.00957
9.8	-0.00638	78.6	0.00957
9.9	0.	78.7	0.00319
10.	0.	78.8	0.00638
10.1	-0.00319	78.9	0.00957
10.2	-0.00319	79.	0.00957
10.3	-0.00638	79.1	0.00638
10.4	0.00638	79.2	0.00638
10.5	-0.00319	79.3	0.01276
10.6	0.00638	79.4	0.00957
10.7	0.	79.5	0.00957
10.8	-0.00319	79.6	0.00957
10.9	0.	79.7	0.01276
11.	-0.00319	79.8	0.00638
11.1	-0.00319	79.9	0.01595
11.2	-0.00319	80.	0.01276
11.3	-0.00638	80.1	0.00957
11.4	-0.00638	80.2	0.00957
11.5	-0.00638	80.3	0.01595
11.6	-0.00319	80.4	0.01276
11.7	-0.00956	80.5	0.01276
11.8	-0.00638	80.6	0.00957
11.9	-0.00319	80.7	0.00638
12.	-0.00638	80.8	0.01595
12.1	0.00319	80.9	0.00957
12.2	-0.00319	81.	0.00957
12.3	-0.00319	81.1	0.00638
12.4	0.	81.2	0.00957
12.5	-0.00956	81.3	0.00957
12.6	-0.00319	81.4	0.00638
12.7	-0.00319	81.5	0.01276
12.8	-0.00319	81.6	0.00957
12.9	-0.00638	81.7	0.01276
13.	-0.00638	81.8	0.00957
13.1	-0.00638	81.9	0.00957
13.2	-0.00319	82.	0.00957
13.3	-0.00319	82.1	0.00957
13.4	-0.00319	82.2	0.00957
13.5	-0.00638	82.3	0.01276
13.6	0.00319	82.4	0.00957
13.7	0.	82.5	0.00957
13.8	-0.00319	82.6	0.00957
13.9	-0.00638	82.7	0.00638
14.	-0.00319	82.8	0.00957
14.1	0.00319	82.9	0.00957
14.2	-0.00319	83.	0.01276
14.3	-0.00638	83.1	0.00638
14.4	-0.00319	83.2	0.01595
14.5	-0.00319	83.3	0.00957
14.6	-0.00956	83.4	0.01913
14.7	-0.00638	83.5	0.00957
14.8	0.	83.6	0.00957
14.9	-0.00319	83.7	0.00957
15.	-0.00319	83.8	0.01276
15.1	-0.00638	83.9	0.00638
15.2	-0.00638	84.	0.00957
15.3	-0.00956	84.1	0.01276
15.4	-0.00638	84.2	0.01276
15.5	-0.00319	84.3	0.00638
15.6	-0.00319	84.4	0.00638
15.7	-0.00638	84.5	0.01276
15.8	-0.00638	84.6	0.00957
15.9	-0.00319	84.7	0.01276
16.	-0.00319	84.8	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00638	84.9	0.01595
16.2	-0.00638	85.	0.00638
16.3	-0.00638	85.1	0.01276
16.4	-0.00638	85.2	0.01913
16.5	0.	85.3	0.01276
16.6	-0.00638	85.4	0.00638
16.7	-0.00638	85.5	0.00638
16.8	-0.00638	85.6	0.00957
16.9	0.	85.7	0.00957
17.	-0.00956	85.8	0.00957
17.1	-0.00956	85.9	0.00957
17.2	0.	86.	0.00957
17.3	-0.00638	86.1	0.01595
17.4	-0.00319	86.2	0.00957
17.5	-0.00638	86.3	0.01276
17.6	-0.00956	86.4	0.01276
17.7	-0.00638	86.5	0.00319
17.8	-0.00319	86.6	0.00957
17.9	-0.00638	86.7	0.00957
18.	-0.00319	86.8	0.01276
18.1	-0.00956	86.9	0.00957
18.2	-0.00638	87.	0.01276
18.3	-0.00638	87.1	0.00319
18.4	-0.00319	87.2	0.00638
18.5	-0.00319	87.3	0.00957
18.6	-0.00319	87.4	0.00638
18.7	-0.00956	87.5	0.01276
18.8	-0.00956	87.6	0.00638
18.9	0.	87.7	0.01276
19.	-0.00638	87.8	0.01595
19.1	0.	87.9	0.00638
19.2	-0.00319	88.	0.00638
19.3	0.00319	88.1	0.01276
19.4	-0.00319	88.2	0.01276
19.5	0.	88.3	0.00957
19.6	-0.00319	88.4	0.00638
19.7	0.00319	88.5	0.00638
19.8	0.	88.6	0.01595
19.9	-0.00638	88.7	0.00638
20.	0.	88.8	0.01276
20.1	-0.00956	88.9	0.01595
20.2	0.00319	89.	0.00957
20.3	-0.00956	89.1	0.01276
20.4	-0.00638	89.2	0.00957
20.5	0.	89.3	0.00957
20.6	0.	89.4	0.01276
20.7	-0.00319	89.5	0.00957
20.8	-0.00319	89.6	0.00957
20.9	0.	89.7	0.01276
21.	0.	89.8	0.00957
21.1	-0.00319	89.9	0.00957
21.2	-0.00319	90.	0.00957
21.3	0.	90.1	0.00638
21.4	-0.01275	90.2	0.01276
21.5	0.	90.3	0.01276
21.6	-0.00319	90.4	0.00957
21.7	0.	90.5	0.00957
21.8	0.	90.6	0.01595
21.9	-0.00319	90.7	0.00957
22.	-0.00319	90.8	0.00957
22.1	-0.00638	90.9	0.01276
22.2	-0.00319	91.	0.00957
22.3	-0.00638	91.1	0.00638
22.4	0.	91.2	0.00957
22.5	-0.00319	91.3	0.00957
22.6	-0.00638	91.4	0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	0.	91.5	0.01276
22.8	0.	91.6	0.01276
22.9	-0.00638	91.7	0.01276
23.	-0.00638	91.8	0.00638
23.1	-0.00319	91.9	0.00957
23.2	-0.00319	92.	0.01595
23.3	-0.00319	92.1	0.00638
23.4	-0.00319	92.2	0.01276
23.5	-0.00956	92.3	0.00957
23.6	-0.00956	92.4	0.00957
23.7	0.	92.5	0.00957
23.8	-0.00638	92.6	0.01276
23.9	-0.00319	92.7	0.00957
24.	0.	92.8	0.01595
24.1	-0.00638	92.9	0.01276
24.2	-0.00956	93.	0.01276
24.3	-0.00319	93.1	0.00957
24.4	-0.00319	93.2	0.00957
24.5	-0.00319	93.3	0.00957
24.6	-0.00638	93.4	0.01595
24.7	-0.00319	93.5	0.00957
24.8	-0.00319	93.6	0.00319
24.9	-0.00638	93.7	0.00957
25.	-0.00319	93.8	0.01276
25.1	-0.01275	93.9	0.01276
25.2	-0.00319	94.	0.00957
25.3	-0.00319	94.1	0.01276
25.4	-0.00638	94.2	0.01276
25.5	-0.00319	94.3	0.01276
25.6	-0.00319	94.4	0.01595
25.7	-0.00319	94.5	0.00957
25.8	-0.00638	94.6	0.00957
25.9	-0.00956	94.7	0.01276
26.	-0.00319	94.8	0.00638
26.1	-0.00319	94.9	0.01276
26.2	-0.00319	95.	0.01913
26.3	0.00638	95.1	0.01276
26.4	-0.00638	95.2	0.00957
26.5	0.	95.3	0.00638
26.6	-0.00319	95.4	0.00957
26.7	-0.00319	95.5	0.01595
26.8	-0.00638	95.6	0.00638
26.9	0.	95.7	0.00638
27.	0.00319	95.8	0.00957
27.1	-0.00319	95.9	0.00638
27.2	0.00319	96.	0.00638
27.3	0.00638	96.1	0.00957
27.4	-0.00319	96.2	0.01276
27.5	-0.00319	96.3	0.01913
27.6	0.00319	96.4	0.00638
27.7	0.00319	96.5	0.00638
27.8	-0.00319	96.6	0.00957
27.9	-0.00319	96.7	0.00957
28.	0.00319	96.8	0.00957
28.1	0.00319	96.9	0.00638
28.2	0.	97.	0.00957
28.3	0.00319	97.1	0.00957
28.4	0.	97.2	0.00319
28.5	0.00319	97.3	0.01913
28.6	0.	97.4	0.01276
28.7	0.00319	97.5	0.00957
28.8	0.00319	97.6	0.00638
28.9	0.00319	97.7	0.01276
29.	0.00319	97.8	0.01276
29.1	0.00638	97.9	0.00957
29.2	-0.00319	98.	0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	0.	98.1	0.01276
29.4	0.00319	98.2	0.00638
29.5	0.	98.3	0.00957
29.6	0.00638	98.4	0.00957
29.7	-0.00319	98.5	0.01276
29.8	0.	98.6	0.01595
29.9	0.00319	98.7	0.01595
30.	-0.00319	98.8	0.00319
30.1	0.00638	98.9	0.01276
30.2	-0.00319	99.	0.01276
30.3	0.00319	99.1	0.00957
30.4	0.00319	99.2	0.01595
30.5	0.00319	99.3	0.01276
30.6	0.00319	99.4	0.01913
30.7	0.	99.5	0.01276
30.8	-0.00319	99.6	0.01276
30.9	-0.00319	99.7	0.00957
31.	0.	99.8	0.00638
31.1	0.00319	99.9	0.01276
31.2	0.00638	100.	0.00957
31.3	0.00319	100.1	0.00957
31.4	0.00319	100.2	0.01595
31.5	0.00319	100.3	0.00638
31.6	0.00319	100.4	0.01276
31.7	0.00319	100.5	0.01276
31.8	-0.00638	100.6	0.00957
31.9	0.00319	100.7	0.00957
32.	0.00319	100.8	0.01595
32.1	0.	100.9	0.00957
32.2	-0.00319	101.	0.00957
32.3	0.00638	101.1	0.01276
32.4	0.00319	101.2	0.01595
32.5	0.	101.3	0.00957
32.6	-0.00638	101.4	0.01276
32.7	0.00638	101.5	0.01276
32.8	0.	101.6	0.01276
32.9	0.00319	101.7	0.01595
33.	0.	101.8	0.00957
33.1	0.	101.9	0.01276
33.2	0.00319	102.	0.00957
33.3	0.00319	102.1	0.01276
33.4	0.00638	102.2	0.01276
33.5	0.	102.3	0.01276
33.6	0.	102.4	0.01276
33.7	0.00319	102.5	0.01595
33.8	0.00638	102.6	0.01276
33.9	0.00638	102.7	0.01595
34.	0.	102.8	0.02551
34.1	0.	102.9	0.01276
34.2	0.	103.	0.00957
34.3	0.00319	103.1	0.01595
34.4	0.00319	103.2	0.00957
34.5	0.	103.3	0.01276
34.6	0.	103.4	0.01276
34.7	0.00319	103.5	0.01276
34.8	0.00319	103.6	0.00957
34.9	0.00319	103.7	0.01595
35.	-0.00319	103.8	0.01276
35.1	0.	103.9	0.01276
35.2	0.	104.	0.01595
35.3	0.	104.1	0.01276
35.4	0.00319	104.2	0.01276
35.5	-0.00638	104.3	0.01595
35.6	0.00319	104.4	0.00957
35.7	0.	104.5	0.01595
35.8	0.00319	104.6	0.01595

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
35.9	0.	104.7	0.01276
36.	0.	104.8	0.01276
36.1	0.00319	104.9	0.01276
36.2	0.00319	105.	0.01276
36.3	-0.00319	105.1	0.01276
36.4	-0.00638	105.2	0.01276
36.5	0.	105.3	0.00319
36.6	0.00319	105.4	0.01276
36.7	0.00319	105.5	0.00957
36.8	0.00319	105.6	0.01276
36.9	0.00319	105.7	0.01595
37.	0.	105.8	0.01913
37.1	0.	105.9	0.00957
37.2	-0.00319	106.	0.00957
37.3	0.00319	106.1	0.01276
37.4	0.00319	106.2	0.01595
37.5	0.00957	106.3	0.01276
37.6	0.	106.4	0.01913
37.7	0.00319	106.5	0.01276
37.8	0.	106.6	0.00957
37.9	0.00957	106.7	0.01276
38.	0.	106.8	0.00957
38.1	0.	106.9	0.00957
38.2	0.00319	107.	0.00957
38.3	0.00319	107.1	0.01276
38.4	0.00319	107.2	0.01276
38.5	0.	107.3	0.01276
38.6	0.	107.4	0.01913
38.7	0.00638	107.5	0.01595
38.8	0.	107.6	0.01595
38.9	0.	107.7	0.01595
39.	0.00319	107.8	0.01595
39.1	0.	107.9	0.01913
39.2	0.	108.	0.01913
39.3	0.00638	108.1	0.01276
39.4	0.00319	108.2	0.01595
39.5	0.01276	108.3	0.01595
39.6	0.	108.4	0.01276
39.7	0.	108.5	0.01595
39.8	0.	108.6	0.01276
39.9	0.00638	108.7	0.01595
40.	0.00957	108.8	0.01913
40.1	0.00319	108.9	0.00957
40.2	0.00319	109.	0.01595
40.3	0.	109.1	0.01595
40.4	0.00319	109.2	0.01913
40.5	0.	109.3	0.01595
40.6	0.00638	109.4	0.02551
40.7	0.00638	109.5	0.00957
40.8	0.00319	109.6	0.00638
40.9	0.00319	109.7	0.01595
41.	0.	109.8	0.01913
41.1	0.00638	109.9	0.01913
41.2	0.	110.	0.01595
41.3	0.	110.1	0.01913
41.4	0.00319	110.2	0.01595
41.5	0.00319	110.3	0.02232
41.6	0.00638	110.4	0.02232
41.7	0.00319	110.5	0.01276
41.8	0.00638	110.6	0.01276
41.9	0.00319	110.7	0.01595
42.	0.	110.8	0.01276
42.1	0.00638	110.9	0.01595
42.2	0.00319	111.	0.00957
42.3	0.00638	111.1	0.01595
42.4	0.00638	111.2	0.01595

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
42.5	-0.00319	111.3	0.01595
42.6	0.	111.4	0.00957
42.7	0.	111.5	0.01913
42.8	0.	111.6	0.01595
42.9	0.	111.7	0.02232
43.	0.00319	111.8	0.01595
43.1	0.00319	111.9	0.01595
43.2	0.00319	112.	0.01595
43.3	0.	112.1	0.01913
43.4	0.	112.2	0.00957
43.5	0.	112.3	0.01595
43.6	0.00319	112.4	0.01913
43.7	0.00319	112.5	0.01276
43.8	0.00319	112.6	0.01595
43.9	0.00638	112.7	0.01276
44.	0.00957	112.8	0.01595
44.1	0.00319	112.9	0.02232
44.2	0.00319	113.	0.01595
44.3	-0.00319	113.1	0.01595
44.4	0.00638	113.2	0.01595
44.5	0.00319	113.3	0.01276
44.6	0.	113.4	0.01913
44.7	0.00638	113.5	0.02551
44.8	0.00638	113.6	0.00957
44.9	0.00319	113.7	0.01595
45.	0.00638	113.8	0.01276
45.1	0.00319	113.9	0.01595
45.2	0.00638	114.	0.01913
45.3	0.00319	114.1	0.01913
45.4	0.00638	114.2	0.01276
45.5	0.00638	114.3	0.01595
45.6	0.00319	114.4	0.01595
45.7	0.00638	114.5	0.01276
45.8	0.00957	114.6	0.01276
45.9	0.00319	114.7	0.01276
46.	0.00638	114.8	0.01595
46.1	0.00638	114.9	0.01276
46.2	0.00319	115.	0.01276
46.3	0.00319	115.1	0.00957
46.4	0.00638	115.2	0.01595
46.5	-0.00319	115.3	0.01276
46.6	0.00638	115.4	0.01276
46.7	0.00638	115.5	0.01276
46.8	0.00319	115.6	0.01913
46.9	0.00319	115.7	0.01595
47.	0.00319	115.8	0.01595
47.1	0.00319	115.9	0.01595
47.2	0.00957	116.	0.00957
47.3	0.00319	116.1	0.01595
47.4	0.	116.2	0.01595
47.5	0.00319	116.3	0.01913
47.6	0.	116.4	0.01595
47.7	0.	116.5	0.01276
47.8	0.00319	116.6	0.02232
47.9	0.	116.7	0.02232
48.	0.00638	116.8	0.01276
48.1	0.00319	116.9	0.01276
48.2	0.00638	117.	0.01595
48.3	0.00319	117.1	0.01595
48.4	0.00319	117.2	0.01276
48.5	0.00319	117.3	0.00957
48.6	0.	117.4	0.01276
48.7	0.00319	117.5	0.01595
48.8	-0.00319	117.6	0.00957
48.9	0.00957	117.7	0.00638
49.	0.00638	117.8	0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
49.1	0.00957	117.9	0.01276
49.2	0.00319	118.	0.01913
49.3	0.00638	118.1	0.00957
49.4	0.00957	118.2	0.01595
49.5	0.00638	118.3	0.01276
49.6	0.00957	118.4	0.01276
49.7	0.00319	118.5	0.01595
49.8	0.00638	118.6	0.01595
49.9	0.00638	118.7	0.01276
50.	0.00319	118.8	0.01276
50.1	0.00638	118.9	0.01276
50.2	0.00319	119.	0.00957
50.3	0.00319	119.1	0.00957
50.4	0.00319	119.2	0.01595
50.5	-0.00319	119.3	0.01913
50.6	0.00638	119.4	0.01276
50.7	0.00957	119.5	0.01276
50.8	0.00319	119.6	0.00957
50.9	0.00957	119.7	0.00638
51.	0.01276	119.8	0.00638
51.1	0.00319	119.9	0.01595
51.2	0.00638	120.	0.01595
51.3	0.00638	120.1	0.01595
51.4	0.00319	120.2	0.01276
51.5	0.00319	120.3	0.01276
51.6	0.00319	120.4	0.00638
51.7	0.00638	120.5	0.01276
51.8	0.	120.6	0.01595
51.9	0.	120.7	0.00638
52.	0.00319	120.8	0.00957
52.1	0.00319	120.9	0.00957
52.2	0.00638	121.	0.01595
52.3	0.00957	121.1	0.01595
52.4	0.00957	121.2	0.02232
52.5	0.00638	121.3	0.00638
52.6	0.00319	121.4	0.00638
52.7	0.00638	121.5	0.01595
52.8	0.00319	121.6	0.01276
52.9	-0.00319	121.7	0.01595
53.	0.01595	121.8	0.01276
53.1	0.00957	121.9	0.00638
53.2	0.00638	122.	0.01595
53.3	0.	122.1	0.01913
53.4	0.	122.2	0.00957
53.5	0.00638	122.3	0.00957
53.6	0.00319	122.4	0.01276
53.7	-0.00319	122.5	0.00957
53.8	0.	122.6	0.00957
53.9	0.00638	122.7	0.01276
54.	0.00319	122.8	0.01276
54.1	0.	122.9	0.01276
54.2	0.00319	123.	0.01595
54.3	0.	123.1	0.00957
54.4	0.00319	123.2	0.01595
54.5	0.00319	123.3	0.01276
54.6	0.00957	123.4	0.01595
54.7	0.00957	123.5	0.01595
54.8	-0.00319	123.6	0.01276
54.9	0.00638	123.7	0.01595
55.	0.00319	123.8	0.01276
55.1	0.	123.9	0.01595
55.2	0.00957	124.	0.00957
55.3	0.00957	124.1	0.02232
55.4	0.00957	124.2	0.01276
55.5	0.00638	124.3	0.01913
55.6	0.	124.4	0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
55.7	0.00638	124.5	0.01913
55.8	0.	124.6	0.01595
55.9	0.00957	124.7	0.01913
56.	0.	124.8	0.00638
56.1	0.00319	124.9	0.01913
56.2	0.	125.	0.01276
56.3	0.00319	125.1	0.01913
56.4	0.00957	125.2	0.02232
56.5	0.00638	125.3	0.02232
56.6	0.00638	125.4	0.01595
56.7	0.00957	125.5	0.01913
56.8	0.	125.6	0.01913
56.9	-0.00319	125.7	0.01276
57.	0.00319	125.8	0.01913
57.1	0.00638	125.9	0.01913
57.2	0.00638	126.	0.01913
57.3	0.00638	126.1	0.01595
57.4	0.00319	126.2	0.01276
57.5	0.00638	126.3	0.01276
57.6	0.00957	126.4	0.01276
57.7	0.	126.5	0.01276
57.8	0.00319	126.6	0.01913
57.9	0.00957	126.7	0.00638
58.	0.00319	126.8	0.01913
58.1	0.00638	126.9	0.01913
58.2	0.00638	127.	0.01276
58.3	0.00638	127.1	0.01276
58.4	0.00319	127.2	0.01595
58.5	0.00319	127.3	0.02232
58.6	0.	127.4	0.02551
58.7	0.00638	127.5	0.01913
58.8	0.00957	127.6	0.01276
58.9	0.00638	127.7	0.02232
59.	0.00319	127.8	0.01595
59.1	0.00319	127.9	0.01913
59.2	0.01595	128.	0.02232
59.3	-0.00319	128.1	0.02232
59.4	0.00638	128.2	0.01913
59.5	0.	128.3	0.02232
59.6	-0.00319	128.4	0.0287
59.7	0.00638	128.5	0.01913
59.8	0.00957	128.6	0.02232
59.9	0.	128.7	0.02551
60.	0.	128.8	0.01913
60.1	0.00319	128.9	0.02232
60.2	0.00638	129.	0.01913
60.3	0.00319	129.1	0.02232
60.4	0.00319	129.2	0.01913
60.5	0.00319	129.3	0.01595
60.6	0.00638	129.4	0.01913
60.7	0.00638	129.5	0.02551
60.8	0.00319	129.6	0.01595
60.9	0.00957	129.7	0.01913
61.	0.00957	129.8	0.02232
61.1	0.00638	129.9	0.01595
61.2	0.00319	130.	0.01595
61.3	0.00957	130.1	0.01276
61.4	0.00638	130.2	0.01595
61.5	0.00319	130.3	0.01913
61.6	0.01595	130.4	0.01595
61.7	0.00957	130.5	0.02232
61.8	0.00638	130.6	0.01913
61.9	0.00957	130.7	0.01595
62.	0.00638	130.8	0.01276
62.1	0.00638	130.9	0.02232
62.2	0.00319	131.	0.02232

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
62.3	0.01276	131.1	0.01595
62.4	0.00957	131.2	0.01913
62.5	0.00638	131.3	0.01595
62.6	0.00638	131.4	0.00957
62.7	0.01595	131.5	0.02232
62.8	0.00319	131.6	0.01595
62.9	0.00319	131.7	0.01913
63.	0.00638	131.8	0.01913
63.1	0.01276	131.9	0.01276
63.2	0.00638	132.	0.01595
63.3	0.00957	132.1	0.01276
63.4	0.00638	132.2	0.01595
63.5	0.	132.3	0.00957
63.6	0.00638	132.4	0.01595
63.7	0.00957	132.5	0.01595
63.8	0.00957	132.6	0.01595
63.9	0.00638	132.7	0.01595
64.	0.00319	132.8	0.01276
64.1	0.00957	132.9	0.01913
64.2	0.	133.	0.01595
64.3	0.01276	133.1	0.01595
64.4	0.00957	133.2	0.01276
64.5	0.00957	133.3	0.01276
64.6	0.00319	133.4	0.00957
64.7	0.00319	133.5	0.01595
64.8	0.00957	133.6	0.01276
64.9	0.00319	133.7	0.01276
65.	0.00638	133.8	0.01595
65.1	0.00638	133.9	0.01595
65.2	0.00319	134.	0.01595
65.3	0.00957	134.1	0.01276
65.4	0.00638	134.2	0.01913
65.5	0.	134.3	0.01595
65.6	0.01276	134.4	0.01276
65.7	0.00957	134.5	0.01913
65.8	0.00957	134.6	0.01913
65.9	0.00957	134.7	0.01913
66.	0.00638	134.8	0.01595
66.1	0.00957	134.9	0.01595
66.2	0.00319	135.	0.01913
66.3	0.00638	135.1	0.01595
66.4	0.00638	135.2	0.01913
66.5	0.00319	135.3	0.01913
66.6	0.00957	135.4	0.01595
66.7	0.00957	135.5	0.01913
66.8	0.00957	135.6	0.01276
66.9	0.00957	135.7	0.01913
67.	0.00638	135.8	0.01595
67.1	0.00319	135.9	0.02232
67.2	0.00638	136.	0.02232
67.3	0.00638	136.1	0.01913
67.4	0.00957	136.2	0.02232
67.5	0.00638	136.3	0.02232
67.6	0.	136.4	0.02551
67.7	0.00957	136.5	0.01913
67.8	0.00638	136.6	0.02232
67.9	0.00957	136.7	0.02551
68.	0.00957	136.8	0.02232
68.1	0.00957	136.9	0.01595
68.2	0.00638	137.	0.01595
68.3	-0.00319	137.1	0.02232
68.4	0.00638	137.2	0.02232
68.5	0.00638	137.3	0.02551
68.6	0.00319	137.4	0.02232
68.7	0.01276	137.5	0.01913

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Hvorslev
Log Factor: 0.1887

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	13.52	ft/day
y0	2.414	ft

K = 0.004771 cm/sec
T = K*b = 88.44 ft²/day (0.951 sq. cm/sec)

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	12.97	0.04451	+/- 0.08732	291.3	ft/day
y0	3.108	0.007089	+/- 0.01391	438.3	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

K = 0.004574 cm/sec
T = K*b = 84.8 ft²/day (0.9118 sq. cm/sec)

Parameter Correlations

	K	y0
K	1.00	0.67
y0	0.67	1.00

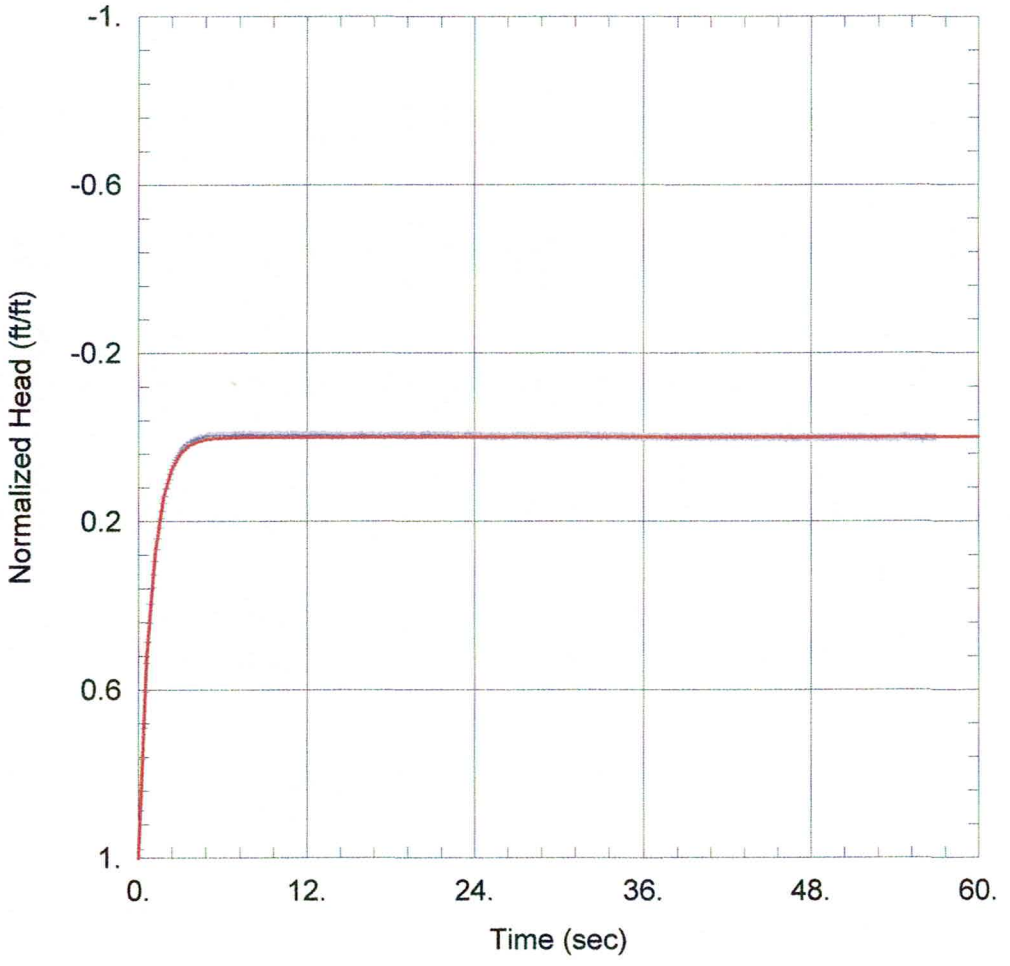
Residual Statistics

for weighted residuals

Sum of Squares . . . . . 0.1919 ft^2
Variance . . . . . 0.0001397 ft^2
Std. Deviation . . . . . 0.01182 ft
Mean . . . . . 0.006926 ft
No. of Residuals 1376
No. of Estimates 2

NOTES

Well Pressure = 53 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\USERS\M_CRAW\Geology_Hydro\Slug Tests\T54_Test2Springer-Gelhar.aqt
Date: 02/13/13 Time: 16:53:21

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T54
Test Date: 02/07/13

AQUIFER DATA

Saturated Thickness: 6.54 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T54)

Initial Displacement: 3.15 ft
Total Well Penetration Depth: 14.15 ft
Casing Radius: 0.02083 ft
Static Water Column Height: 6.54 ft
Screen Length: 10. ft
Well Radius: 0.0833 ft

SOLUTION

Aquifer Model: Unconfined
K = 9.137 ft/day
Solution Method: Springer-Gelhar
Le = 0.1039 ft

Data Set: K:\USERS\M_CRAW\Geology_Hydro\Slug Tests\T54_Test2Springer-Gelhar.aqt
Title: Pneumatic Slug Test
Date: 02/13/13
Time: 16:55:17

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/13
Test Well: T54

AQUIFER DATA

Saturated Thickness: 6.54 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T54

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 3.15 ft
Static Water Column Height: 6.54 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 10. ft
Total Well Penetration Depth: 14.15 ft

No. of Observations: 570

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	3.157	28.5	-0.00638
0.1	3.083	28.6	-0.00956
0.2	2.79	28.7	-0.00638
0.3	2.407	28.8	-0.00956
0.4	2.175	28.9	-0.00638
0.5	1.904	29.	-0.00956
0.6	1.687	29.1	-0.00638
0.7	1.531	29.2	-0.00638
0.8	1.39	29.3	-0.00638
0.9	1.247	29.4	0.
1.	1.126	29.5	-0.00319
1.1	1.027	29.6	-0.00638
1.2	0.9247	29.7	-0.00319
1.3	0.8386	29.8	-0.00638
1.4	0.7525	29.9	-0.00319
1.5	0.676	30.	-0.00319
1.6	0.6059	30.1	-0.00956
1.7	0.5516	30.2	-0.00638
1.8	0.4911	30.3	-0.00638
1.9	0.44	30.4	-0.00638
2.	0.3826	30.5	-0.00956
2.1	0.3412	30.6	-0.00638
2.2	0.3125	30.7	-0.00956
2.3	0.271	30.8	-0.00956
2.4	0.2392	30.9	-0.00638
2.5	0.2073	31.	-0.00956
2.6	0.185	31.1	-0.00956
2.7	0.1658	31.2	0.
2.8	0.1467	31.3	-0.00956

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	0.1339	31.4	-0.00956
3.	0.1084	31.5	-0.00956
3.1	0.09566	31.6	-0.00956
3.2	0.08291	31.7	-0.00956
3.3	0.07015	31.8	-0.00956
3.4	0.0574	31.9	-0.00956
3.5	0.05102	32.	-0.01275
3.6	0.05102	32.1	-0.00956
3.7	0.03189	32.2	-0.00956
3.8	0.03508	32.3	-0.00638
3.9	0.02551	32.4	-0.00319
4.	0.01595	32.5	-0.00638
4.1	0.01913	32.6	-0.00638
4.2	0.00957	32.7	-0.00319
4.3	0.00638	32.8	-0.00638
4.4	0.	32.9	-0.01275
4.5	0.00319	33.	-0.00638
4.6	0.00319	33.1	0.
4.7	0.00319	33.2	-0.00319
4.8	-0.00319	33.3	-0.00956
4.9	-0.00956	33.4	-0.00956
5.	-0.01594	33.5	0.
5.1	-0.01275	33.6	-0.00319
5.2	-0.00956	33.7	-0.00956
5.3	-0.01594	33.8	-0.00638
5.4	-0.00956	33.9	-0.00638
5.5	-0.01275	34.	-0.00638
5.6	-0.01594	34.1	-0.00638
5.7	-0.01594	34.2	-0.00638
5.8	-0.01594	34.3	0.
5.9	-0.01594	34.4	-0.00956
6.	-0.01594	34.5	-0.00319
6.1	-0.01594	34.6	-0.00638
6.2	-0.01913	34.7	-0.00319
6.3	-0.01275	34.8	-0.00319
6.4	-0.01275	34.9	-0.00638
6.5	-0.01594	35.	0.
6.6	-0.01913	35.1	-0.00638
6.7	-0.01594	35.2	-0.00319
6.8	-0.01913	35.3	-0.00638
6.9	-0.02232	35.4	-0.00638
7.	-0.01275	35.5	0.00319
7.1	-0.01913	35.6	-0.00319
7.2	-0.01913	35.7	-0.00319
7.3	-0.02232	35.8	0.
7.4	-0.02232	35.9	0.
7.5	-0.02551	36.	0.
7.6	-0.01594	36.1	0.00638
7.7	-0.01594	36.2	-0.00319
7.8	-0.01913	36.3	0.
7.9	-0.02232	36.4	-0.00638
8.	-0.02551	36.5	-0.00319
8.1	-0.01594	36.6	0.00319
8.2	-0.01913	36.7	-0.00319
8.3	-0.01913	36.8	-0.00319
8.4	-0.01594	36.9	-0.00319
8.5	-0.01913	37.	-0.00319
8.6	-0.01913	37.1	-0.00319
8.7	-0.02232	37.2	0.00319
8.8	-0.01594	37.3	-0.00638
8.9	-0.01913	37.4	0.
9.	-0.01913	37.5	-0.00638
9.1	-0.01594	37.6	-0.00319
9.2	-0.01913	37.7	-0.00638
9.3	-0.01275	37.8	-0.00319
9.4	-0.01913	37.9	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.02232	38.	0.
9.6	-0.01275	38.1	0.
9.7	-0.02232	38.2	-0.00319
9.8	-0.01913	38.3	-0.00319
9.9	-0.01913	38.4	-0.00638
10.	-0.02232	38.5	0.00319
10.1	-0.01913	38.6	-0.00319
10.2	-0.01913	38.7	-0.00638
10.3	-0.01594	38.8	-0.00956
10.4	-0.01594	38.9	-0.00638
10.5	-0.01913	39.	-0.00319
10.6	-0.01913	39.1	0.
10.7	-0.00956	39.2	-0.00319
10.8	-0.01913	39.3	0.
10.9	-0.02232	39.4	0.
11.	-0.02232	39.5	-0.00319
11.1	-0.02232	39.6	-0.00319
11.2	-0.02232	39.7	0.
11.3	-0.01913	39.8	-0.00319
11.4	-0.01594	39.9	-0.00319
11.5	-0.01594	40.	-0.00638
11.6	-0.01594	40.1	-0.00319
11.7	-0.01594	40.2	0.00319
11.8	-0.01913	40.3	-0.00319
11.9	-0.01913	40.4	-0.00319
12.	-0.01594	40.5	-0.00319
12.1	-0.01594	40.6	-0.00638
12.2	-0.01594	40.7	-0.00319
12.3	-0.01913	40.8	0.00638
12.4	-0.01913	40.9	-0.00319
12.5	-0.02232	41.	-0.00638
12.6	-0.01913	41.1	0.
12.7	-0.01913	41.2	-0.00319
12.8	-0.01594	41.3	-0.00319
12.9	-0.01275	41.4	0.
13.	-0.01913	41.5	-0.00319
13.1	-0.02232	41.6	-0.00638
13.2	-0.02232	41.7	-0.00319
13.3	-0.02232	41.8	-0.00319
13.4	-0.01913	41.9	0.
13.5	-0.01275	42.	0.
13.6	-0.01594	42.1	-0.00319
13.7	-0.01275	42.2	-0.00956
13.8	-0.00956	42.3	0.00319
13.9	-0.01275	42.4	-0.00319
14.	-0.01275	42.5	-0.00319
14.1	-0.01913	42.6	0.
14.2	-0.00956	42.7	-0.00319
14.3	-0.00956	42.8	-0.00638
14.4	-0.01913	42.9	-0.00319
14.5	-0.00638	43.	-0.00638
14.6	-0.01594	43.1	-0.00319
14.7	-0.01275	43.2	-0.00638
14.8	-0.01275	43.3	0.
14.9	-0.01275	43.4	-0.00319
15.	-0.00956	43.5	-0.00638
15.1	-0.01275	43.6	-0.00319
15.2	-0.01275	43.7	0.
15.3	-0.01275	43.8	-0.00319
15.4	-0.01594	43.9	0.
15.5	-0.01275	44.	0.00319
15.6	-0.01275	44.1	-0.00638
15.7	-0.01594	44.2	0.00319
15.8	-0.01594	44.3	0.
15.9	-0.02232	44.4	-0.00319
16.	-0.01594	44.5	-0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00956	44.6	-0.00319
16.2	-0.01275	44.7	-0.00638
16.3	-0.01275	44.8	-0.00319
16.4	-0.01594	44.9	0.
16.5	-0.01594	45.	0.
16.6	-0.01275	45.1	0.
16.7	-0.01913	45.2	0.
16.8	-0.01594	45.3	0.
16.9	-0.00956	45.4	-0.00319
17.	-0.00956	45.5	-0.00319
17.1	-0.01275	45.6	0.
17.2	-0.01594	45.7	-0.00319
17.3	-0.01594	45.8	-0.00319
17.4	-0.00956	45.9	-0.00319
17.5	-0.00956	46.	0.
17.6	-0.00956	46.1	0.00638
17.7	-0.00956	46.2	0.00957
17.8	-0.01275	46.3	0.00319
17.9	-0.00956	46.4	-0.00638
18.	-0.01594	46.5	0.
18.1	-0.01275	46.6	0.
18.2	-0.01594	46.7	0.00319
18.3	-0.01594	46.8	0.01276
18.4	-0.01275	46.9	0.
18.5	-0.01275	47.	0.
18.6	-0.01275	47.1	0.
18.7	-0.01275	47.2	0.00319
18.8	-0.01913	47.3	0.00319
18.9	-0.01275	47.4	-0.00319
19.	-0.00319	47.5	-0.00319
19.1	-0.01275	47.6	0.00319
19.2	-0.00956	47.7	0.
19.3	-0.00956	47.8	0.00319
19.4	-0.01275	47.9	0.
19.5	-0.01594	48.	0.
19.6	-0.01275	48.1	-0.00638
19.7	-0.00956	48.2	0.
19.8	-0.01275	48.3	0.00638
19.9	-0.00956	48.4	0.00319
20.	-0.00638	48.5	0.
20.1	-0.00956	48.6	-0.00638
20.2	-0.00956	48.7	0.
20.3	-0.01594	48.8	0.
20.4	-0.01594	48.9	0.00319
20.5	-0.01275	49.	0.
20.6	-0.01913	49.1	0.00638
20.7	-0.01594	49.2	0.00319
20.8	-0.01594	49.3	0.
20.9	-0.00638	49.4	-0.00319
21.	-0.01594	49.5	0.
21.1	-0.01275	49.6	0.
21.2	-0.01275	49.7	0.
21.3	-0.01275	49.8	-0.00319
21.4	-0.00638	49.9	0.
21.5	-0.01594	50.	0.
21.6	-0.01594	50.1	-0.00319
21.7	-0.01275	50.2	-0.00319
21.8	-0.00956	50.3	0.00638
21.9	-0.01275	50.4	-0.00638
22.	-0.01594	50.5	0.00638
22.1	-0.01594	50.6	-0.00638
22.2	-0.01275	50.7	0.
22.3	-0.00638	50.8	0.
22.4	-0.00956	50.9	-0.00319
22.5	-0.00956	51.	0.00638
22.6	-0.01275	51.1	-0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.01275	51.2	0.00638
22.8	-0.01275	51.3	0.
22.9	-0.01275	51.4	-0.00638
23.	-0.00638	51.5	-0.00319
23.1	-0.01275	51.6	-0.00319
23.2	-0.00638	51.7	0.
23.3	-0.01275	51.8	0.
23.4	-0.01275	51.9	0.
23.5	-0.02551	52.	0.00319
23.6	-0.00956	52.1	0.00638
23.7	-0.00956	52.2	0.00638
23.8	-0.00956	52.3	-0.00319
23.9	-0.01275	52.4	0.
24.	-0.01275	52.5	0.
24.1	-0.01275	52.6	0.00319
24.2	-0.00956	52.7	0.00957
24.3	-0.01275	52.8	0.00319
24.4	-0.00956	52.9	0.00319
24.5	-0.00638	53.	0.00638
24.6	-0.00956	53.1	0.00319
24.7	-0.00956	53.2	0.00319
24.8	-0.00638	53.3	0.00319
24.9	0.	53.4	0.00319
25.	-0.00319	53.5	0.00319
25.1	-0.00638	53.6	0.00638
25.2	-0.00638	53.7	0.00638
25.3	-0.00956	53.8	0.00319
25.4	-0.00319	53.9	-0.00319
25.5	-0.00319	54.	0.
25.6	-0.00319	54.1	0.00638
25.7	-0.00956	54.2	0.00638
25.8	-0.00956	54.3	0.
25.9	-0.00319	54.4	0.
26.	-0.00319	54.5	-0.00956
26.1	-0.00319	54.6	-0.00319
26.2	-0.00319	54.7	-0.00319
26.3	-0.00956	54.8	-0.00956
26.4	-0.00638	54.9	0.00319
26.5	-0.00319	55.	-0.00319
26.6	-0.00319	55.1	0.00638
26.7	-0.00956	55.2	0.00319
26.8	-0.00638	55.3	0.00319
26.9	-0.00638	55.4	0.00319
27.	-0.00638	55.5	0.00638
27.1	-0.01275	55.6	0.
27.2	-0.00956	55.7	0.00319
27.3	-0.00956	55.8	-0.00319
27.4	-0.01275	55.9	0.01276
27.5	-0.00956	56.	0.02232
27.6	-0.00956	56.1	0.00319
27.7	-0.00319	56.2	-0.00638
27.8	-0.00956	56.3	0.00638
27.9	-0.00638	56.4	0.
28.	-0.00638	56.5	0.00638
28.1	-0.01275	56.6	0.
28.2	-0.00956	56.7	0.00638
28.3	-0.00319	56.8	-0.00319
28.4	-0.00956	56.9	0.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 3.84

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	9.137	ft/day
Le	0.1039	ft

K = 0.003223 cm/sec
T = K*b = 59.75 ft²/day (0.6425 sq. cm/sec)
Le = 0.1039 ft
Solution is critically damped when C(D) = 1.

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	8.725	0.02325	+/- 0.04566	375.3	ft/day
Le	1.98	0.08261	+/- 0.1622	23.97	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

K = 0.003078 cm/sec
T = K*b = 57.06 ft²/day (0.6136 sq. cm/sec)
Le = 1.98 ft
Solution is critically damped when C(D) = 1.

Parameter Correlations

	K	Le
K	1.00	0.00
Le	0.00	1.00

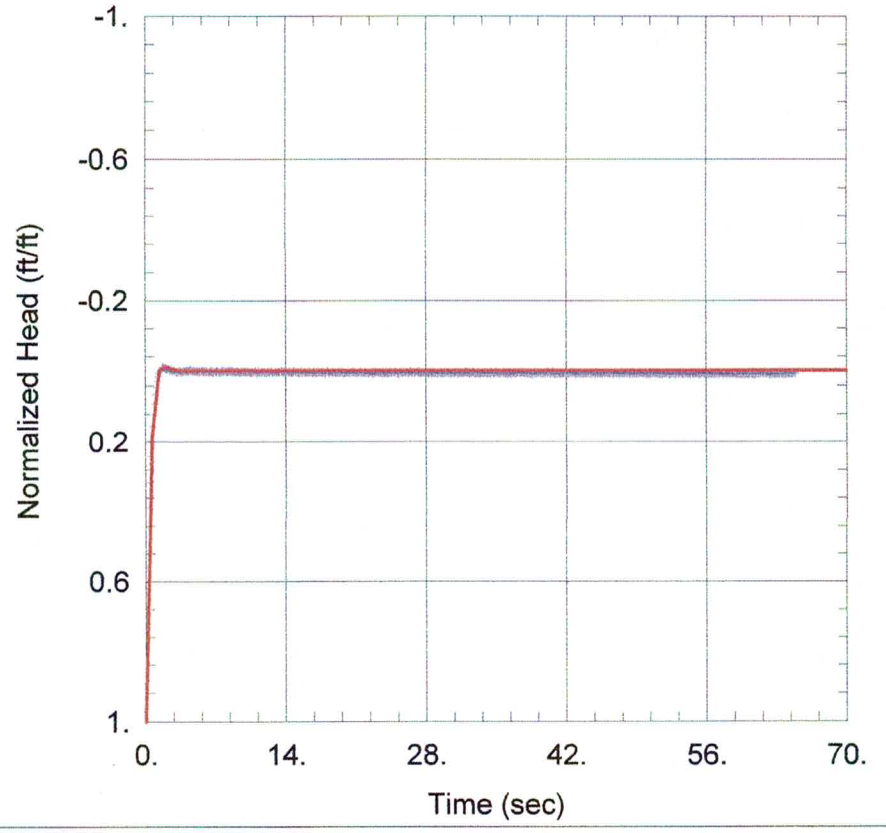
Residual Statistics

for weighted residuals

Sum of Squares . . . . . 0.102 ft^2
Variance . . . . . 0.0001795 ft^2
Std. Deviation . . . . . 0.0134 ft
Mean . . . . . -0.007109 ft
No. of Residuals 570
No. of Estimates 2

NOTES

Well Pressure = 53 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T58_Test2Springer-Gelhar.aqt
Date: 02/12/13 Time: 14:20:52

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T58
Test Date: 02/06/13

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 449.3 ft/day
Le = 0.08659 ft

AQUIFER DATA

Saturated Thickness: 12.42 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T58)

Initial Displacement: 2.51 ft
Total Well Penetration Depth: 18.48 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 12.42 ft
Screen Length: 15. ft
Well Radius: 0.0833 ft

Data Set: K:\USERS\M_CRAW\Geology_Hydro\Slug Tests\T58_Test2Springer-Gelhar.aqt
Title: Pneumatic Slug Test
Date: 02/13/13
Time: 16:56:50

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/06/13
Test Well: T58

AQUIFER DATA

Saturated Thickness: 12.42 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T58

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.51 ft
Static Water Column Height: 12.42 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 15. ft
Total Well Penetration Depth: 18.48 ft

No. of Observations: 651

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.532	32.6	0.01595
0.1	2.089	32.7	0.00957
0.2	1.735	32.8	0.00957
0.3	1.282	32.9	0.01595
0.4	0.9757	33.	0.01913
0.5	0.7908	33.1	0.01595
0.6	0.609	33.2	0.01595
0.7	0.4974	33.3	0.01595
0.8	0.389	33.4	0.01913
0.9	0.3029	33.5	0.01913
1.	0.2232	33.6	0.01276
1.1	0.1594	33.7	0.01595
1.2	0.1116	33.8	0.01595
1.3	0.06696	33.9	0.01595
1.4	0.03508	34.	0.01276
1.5	0.01276	34.1	0.01913
1.6	-0.00319	34.2	0.01595
1.7	-0.01913	34.3	0.01913
1.8	-0.02551	34.4	0.01913
1.9	-0.02232	34.5	0.01913
2.	-0.01913	34.6	0.00957
2.1	-0.01275	34.7	0.01595
2.2	-0.01275	34.8	0.01595
2.3	-0.01594	34.9	0.01913
2.4	-0.01275	35.	0.01276
2.5	-0.00319	35.1	0.00957
2.6	-0.00956	35.2	0.01595
2.7	-0.00319	35.3	0.01595
2.8	0.	35.4	0.01913

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.00319	35.5	0.01595
3.	0.00319	35.6	0.01913
3.1	0.00638	35.7	0.01595
3.2	0.00638	35.8	0.01595
3.3	0.00957	35.9	0.01595
3.4	0.00319	36.	0.01595
3.5	0.00319	36.1	0.02232
3.6	0.00319	36.2	0.01595
3.7	0.00957	36.3	0.02232
3.8	0.	36.4	0.01913
3.9	0.00319	36.5	0.01595
4.	0.	36.6	0.02232
4.1	0.	36.7	0.01595
4.2	0.	36.8	0.01276
4.3	0.	36.9	0.01595
4.4	0.00319	37.	0.01913
4.5	-0.00637	37.1	0.01595
4.6	-0.00319	37.2	0.01595
4.7	-0.00319	37.3	0.01276
4.8	0.	37.4	0.01276
4.9	0.	37.5	0.01595
5.	-0.00319	37.6	0.00957
5.1	0.	37.7	0.01276
5.2	0.	37.8	0.01595
5.3	0.00319	37.9	0.01913
5.4	0.00319	38.	0.01913
5.5	0.00319	38.1	0.01595
5.6	0.	38.2	0.01595
5.7	0.	38.3	0.01913
5.8	0.00319	38.4	0.01913
5.9	0.00319	38.5	0.02232
6.	0.	38.6	0.01595
6.1	0.00319	38.7	0.02232
6.2	0.00319	38.8	0.01595
6.3	0.00638	38.9	0.01913
6.4	0.00638	39.	0.01595
6.5	0.	39.1	0.01595
6.6	0.00319	39.2	0.01276
6.7	0.	39.3	0.01595
6.8	0.00638	39.4	0.01276
6.9	0.00319	39.5	0.01913
7.	0.00319	39.6	0.01595
7.1	0.00319	39.7	0.01913
7.2	0.	39.8	0.01595
7.3	0.00319	39.9	0.01913
7.4	0.00957	40.	0.01595
7.5	0.00638	40.1	0.00957
7.6	0.00638	40.2	0.01913
7.7	0.	40.3	0.00957
7.8	0.	40.4	0.01913
7.9	0.00319	40.5	0.01595
8.	0.	40.6	0.01913
8.1	0.00319	40.7	0.00957
8.2	0.00638	40.8	0.01595
8.3	0.00319	40.9	0.01913
8.4	0.00319	41.	0.02232
8.5	0.	41.1	0.01595
8.6	0.	41.2	0.02232
8.7	0.00319	41.3	0.01595
8.8	0.	41.4	0.02232
8.9	0.00638	41.5	0.01913
9.	0.00638	41.6	0.01595
9.1	0.00638	41.7	0.01913
9.2	0.00319	41.8	0.01913
9.3	0.00638	41.9	0.01595
9.4	0.00638	42.	0.01913

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	0.00957	42.1	0.01913
9.6	0.00638	42.2	0.01595
9.7	0.00638	42.3	0.01913
9.8	0.00319	42.4	0.01595
9.9	0.00957	42.5	0.01276
10.	0.00319	42.6	0.01276
10.1	0.00319	42.7	0.01913
10.2	0.00957	42.8	0.01276
10.3	0.00319	42.9	0.01276
10.4	0.00638	43.	0.02232
10.5	0.00638	43.1	0.01595
10.6	0.00638	43.2	0.01595
10.7	0.00638	43.3	0.01595
10.8	0.00638	43.4	0.01913
10.9	0.00957	43.5	0.01913
11.	-0.00319	43.6	0.01595
11.1	0.00638	43.7	0.01913
11.2	0.01276	43.8	0.01595
11.3	0.00319	43.9	0.01913
11.4	0.00638	44.	0.01913
11.5	0.00957	44.1	0.01595
11.6	0.00638	44.2	0.01913
11.7	0.00957	44.3	0.01595
11.8	0.00638	44.4	0.01913
11.9	0.00957	44.5	0.01913
12.	0.00638	44.6	0.01913
12.1	0.00957	44.7	0.01913
12.2	0.00957	44.8	0.01276
12.3	0.00638	44.9	0.02232
12.4	0.00638	45.	0.01913
12.5	0.00957	45.1	0.00957
12.6	0.	45.2	0.02232
12.7	0.00638	45.3	0.01595
12.8	0.00957	45.4	0.01913
12.9	0.01276	45.5	0.02232
13.	0.00638	45.6	0.01913
13.1	0.00638	45.7	0.01913
13.2	0.00957	45.8	0.01276
13.3	0.00957	45.9	0.01913
13.4	0.00957	46.	0.01595
13.5	0.00638	46.1	0.01595
13.6	0.00319	46.2	0.01595
13.7	0.00638	46.3	0.01595
13.8	0.00638	46.4	0.01913
13.9	0.00638	46.5	0.01913
14.	0.00957	46.6	0.01913
14.1	0.00957	46.7	0.01595
14.2	0.00319	46.8	0.01913
14.3	0.00957	46.9	0.01276
14.4	0.00638	47.	0.01595
14.5	0.00638	47.1	0.01913
14.6	0.01276	47.2	0.01913
14.7	0.00957	47.3	0.01595
14.8	0.00638	47.4	0.02232
14.9	0.00319	47.5	0.01913
15.	0.00638	47.6	0.01913
15.1	0.00957	47.7	0.01595
15.2	0.00638	47.8	0.01913
15.3	0.00957	47.9	0.01913
15.4	0.01595	48.	0.01276
15.5	0.00957	48.1	0.01913
15.6	0.00638	48.2	0.01913
15.7	0.00638	48.3	0.01913
15.8	0.00638	48.4	0.01913
15.9	0.00638	48.5	0.01913
16.	0.00957	48.6	0.01595

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	0.01276	48.7	0.02232
16.2	0.00638	48.8	0.01913
16.3	0.00957	48.9	0.01913
16.4	0.00957	49.	0.01595
16.5	0.00638	49.1	0.01913
16.6	0.01276	49.2	0.01913
16.7	0.01276	49.3	0.01913
16.8	0.00638	49.4	0.01913
16.9	0.00957	49.5	0.01276
17.	0.01276	49.6	0.01595
17.1	0.01276	49.7	0.01595
17.2	0.00957	49.8	0.01913
17.3	0.00957	49.9	0.01595
17.4	0.00957	50.	0.01913
17.5	0.00957	50.1	0.02232
17.6	0.00957	50.2	0.01913
17.7	0.01276	50.3	0.02232
17.8	0.00957	50.4	0.02232
17.9	0.01276	50.5	0.02232
18.	0.01595	50.6	0.01595
18.1	0.01276	50.7	0.01913
18.2	0.00319	50.8	0.01595
18.3	0.00957	50.9	0.02232
18.4	0.01595	51.	0.01595
18.5	0.01276	51.1	0.01595
18.6	0.00957	51.2	0.02232
18.7	0.01276	51.3	0.01595
18.8	0.00957	51.4	0.02232
18.9	0.01276	51.5	0.01913
19.	0.01276	51.6	0.02232
19.1	0.01276	51.7	0.01913
19.2	0.01276	51.8	0.01913
19.3	0.00638	51.9	0.01913
19.4	0.01276	52.	0.01595
19.5	0.00957	52.1	0.01595
19.6	0.01276	52.2	0.01913
19.7	0.00638	52.3	0.02232
19.8	0.01595	52.4	0.02551
19.9	0.01276	52.5	0.01913
20.	0.01276	52.6	0.01913
20.1	0.01276	52.7	0.01595
20.2	0.01276	52.8	0.02232
20.3	0.00957	52.9	0.02232
20.4	0.01595	53.	0.02232
20.5	0.01276	53.1	0.01595
20.6	0.01276	53.2	0.01913
20.7	0.00957	53.3	0.02232
20.8	0.00957	53.4	0.01595
20.9	0.01276	53.5	0.01913
21.	0.01276	53.6	0.01595
21.1	0.01276	53.7	0.02232
21.2	0.01595	53.8	0.02232
21.3	0.01276	53.9	0.01913
21.4	0.01276	54.	0.01913
21.5	0.00957	54.1	0.01595
21.6	0.01595	54.2	0.02232
21.7	0.01276	54.3	0.01913
21.8	0.01276	54.4	0.01595
21.9	0.01276	54.5	0.02551
22.	0.00638	54.6	0.01595
22.1	0.01595	54.7	0.01595
22.2	0.01276	54.8	0.02232
22.3	0.01595	54.9	0.01913
22.4	0.01276	55.	0.01913
22.5	0.01276	55.1	0.01913
22.6	0.01276	55.2	0.01595

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	0.01595	55.3	0.02232
22.8	0.02232	55.4	0.02232
22.9	0.00957	55.5	0.01913
23.	0.00957	55.6	0.01913
23.1	0.01276	55.7	0.01276
23.2	0.00638	55.8	0.01913
23.3	0.01276	55.9	0.02232
23.4	0.01276	56.	0.01595
23.5	0.01276	56.1	0.02232
23.6	0.01276	56.2	0.01913
23.7	0.01595	56.3	0.02232
23.8	0.00957	56.4	0.01595
23.9	0.01913	56.5	0.02232
24.	0.01276	56.6	0.01913
24.1	0.01276	56.7	0.01276
24.2	0.01595	56.8	0.02232
24.3	0.01595	56.9	0.01913
24.4	0.01276	57.	0.02232
24.5	0.00957	57.1	0.01913
24.6	0.01276	57.2	0.02232
24.7	0.01276	57.3	0.02232
24.8	0.01276	57.4	0.01913
24.9	0.01276	57.5	0.01913
25.	0.00957	57.6	0.01595
25.1	0.01276	57.7	0.02551
25.2	0.01595	57.8	0.02232
25.3	0.01595	57.9	0.01913
25.4	0.01595	58.	0.01913
25.5	0.01276	58.1	0.02551
25.6	0.01276	58.2	0.01595
25.7	0.01595	58.3	0.02232
25.8	0.00957	58.4	0.01913
25.9	0.01276	58.5	0.01913
26.	0.01276	58.6	0.01913
26.1	0.01276	58.7	0.01913
26.2	0.00957	58.8	0.01913
26.3	0.01595	58.9	0.01913
26.4	0.01276	59.	0.01913
26.5	0.00638	59.1	0.02551
26.6	0.01276	59.2	0.02232
26.7	0.01276	59.3	0.01913
26.8	0.01276	59.4	0.02232
26.9	0.01595	59.5	0.01913
27.	0.01276	59.6	0.02551
27.1	0.01276	59.7	0.02232
27.2	0.00957	59.8	0.01595
27.3	0.01595	59.9	0.02551
27.4	0.00957	60.	0.01913
27.5	0.01595	60.1	0.02232
27.6	0.01595	60.2	0.02232
27.7	0.01276	60.3	0.02551
27.8	0.01276	60.4	0.01913
27.9	0.01276	60.5	0.01913
28.	0.01276	60.6	0.02551
28.1	0.01276	60.7	0.02232
28.2	0.01276	60.8	0.02232
28.3	0.01595	60.9	0.02551
28.4	0.01595	61.	0.01913
28.5	0.00957	61.1	0.01913
28.6	0.01913	61.2	0.02232
28.7	0.01595	61.3	0.01913
28.8	0.01276	61.4	0.01913
28.9	0.01595	61.5	0.01913
29.	0.01276	61.6	0.01595
29.1	0.01913	61.7	0.01913
29.2	0.01913	61.8	0.02232

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	0.01595	61.9	0.01595
29.4	0.01276	62.	0.01913
29.5	0.01595	62.1	0.02232
29.6	0.01595	62.2	0.01595
29.7	0.01913	62.3	0.0287
29.8	0.01595	62.4	0.02232
29.9	0.01595	62.5	0.02551
30.	0.01276	62.6	0.02232
30.1	0.01595	62.7	0.01913
30.2	0.01276	62.8	0.02551
30.3	0.01913	62.9	0.02232
30.4	0.01595	63.	0.02232
30.5	0.01913	63.1	0.01913
30.6	0.01595	63.2	0.02232
30.7	0.01913	63.3	0.02232
30.8	0.01595	63.4	0.02551
30.9	0.01595	63.5	0.01913
31.	0.01276	63.6	0.01913
31.1	0.01276	63.7	0.02232
31.2	0.01595	63.8	0.02551
31.3	0.01595	63.9	0.02232
31.4	0.01276	64.	0.01913
31.5	0.01595	64.1	0.02232
31.6	0.01595	64.2	0.02232
31.7	0.01595	64.3	0.01913
31.8	0.01913	64.4	0.02232
31.9	0.01276	64.5	0.01595
32.	0.00638	64.6	0.02232
32.1	0.01276	64.7	0.01595
32.2	0.00957	64.8	0.01595
32.3	0.01595	64.9	0.01913
32.4	0.01913	65.	0.01913
32.5	0.01595		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.131

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	449.3	ft/day
Le	0.08659	ft

K = 0.1585 cm/sec
T = K*b = 5580.9 ft²/day (60.01 sq. cm/sec)
Le = 0.08659 ft
Solution is critically damped when C(D) = 1.

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	11.17	0.06908	+/- 0.1357	161.7	ft/day
Le	0.5206	0.03768	+/- 0.074	13.82	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

K = 0.00394 cm/sec
T = K*b = 138.7 ft²/day (1.491 sq. cm/sec)
Le = 0.5206 ft
Solution is critically damped when C(D) = 1.

Parameter Correlations

	K	Le
K	1.00	0.00
Le	0.00	1.00

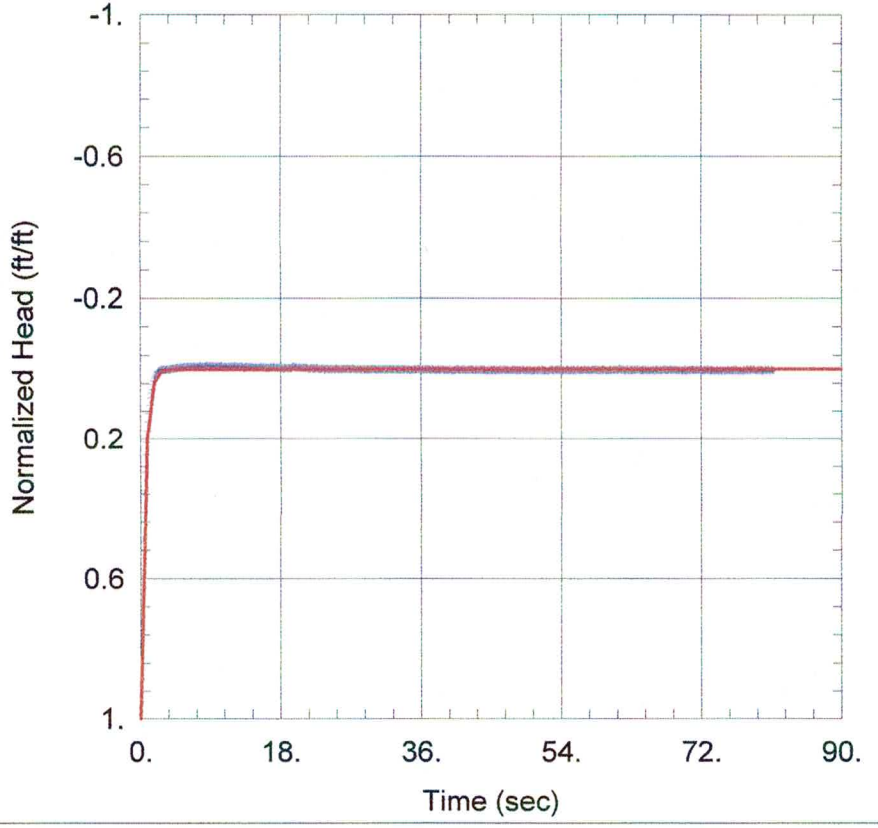
Residual Statistics

for weighted residuals

Sum of Squares . . . . . 0.1802 ft^2
Variance . . . . . 0.0002776 ft^2
Std. Deviation . . . . . 0.01666 ft
Mean . . . . . 0.01295 ft
No. of Residuals 651
No. of Estimates 2

NOTES

Well Pressure = 46 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T59_Test2Springer-Gelhar.aqt
Date: 02/12/13 Time: 14:25:13

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T59
Test Date: 02/07/13

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 7.154 ft/day
Le = 0.3441 ft

AQUIFER DATA

Saturated Thickness: 20.16 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T59)

Initial Displacement: 3.01 ft
Total Well Penetration Depth: 24.52 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 20.16 ft
Screen Length: 20. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:01:04

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/13
Test Well: T59

AQUIFER DATA

Saturated Thickness: 20.16 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T59

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 3.01 ft
Static Water Column Height: 20.16 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 20. ft
Total Well Penetration Depth: 24.52 ft

No. of Observations: 815

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	3.01	40.8	0.
0.1	2.583	40.9	0.00319
0.2	2.216	41.	0.00957
0.3	1.786	41.1	0.00638
0.4	1.496	41.2	0.00957
0.5	1.24	41.3	0.00319
0.6	1.052	41.4	0.00319
0.7	0.8897	41.5	0.00638
0.8	0.743	41.6	0.
0.9	0.6314	41.7	0.00638
1.	0.5293	41.8	0.00957
1.1	0.4496	41.9	0.00319
1.2	0.3795	42.	0.00638
1.3	0.3093	42.1	0.00319
1.4	0.2423	42.2	0.00319
1.5	0.2009	42.3	0.00319
1.6	0.1722	42.4	0.00319
1.7	0.1276	42.5	0.00319
1.8	0.09885	42.6	0.00638
1.9	0.07334	42.7	0.00638
2.	0.0574	42.8	0.00319
2.1	0.04783	42.9	0.00957
2.2	0.0287	43.	0.00638
2.3	0.01914	43.1	0.00638
2.4	0.01595	43.2	0.00319
2.5	0.01276	43.3	0.00957
2.6	0.00319	43.4	0.00319
2.7	0.00638	43.5	0.00957
2.8	0.	43.6	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	0.00638	43.7	0.00638
3.	0.00319	43.8	0.00638
3.1	-0.00637	43.9	0.00319
3.2	0.00319	44.	0.00638
3.3	0.00319	44.1	0.00638
3.4	-0.00319	44.2	0.00638
3.5	0.	44.3	0.00957
3.6	0.	44.4	0.00957
3.7	0.00638	44.5	0.01276
3.8	0.	44.6	0.00957
3.9	-0.00319	44.7	0.00638
4.	-0.00637	44.8	0.00638
4.1	-0.00956	44.9	0.01276
4.2	-0.00637	45.	0.00638
4.3	-0.00956	45.1	0.00638
4.4	-0.00637	45.2	0.00957
4.5	-0.01275	45.3	0.00319
4.6	-0.01275	45.4	0.00638
4.7	-0.00956	45.5	0.00319
4.8	-0.01594	45.6	0.00957
4.9	-0.01594	45.7	0.01276
5.	-0.01275	45.8	0.00319
5.1	-0.01275	45.9	0.00957
5.2	-0.01913	46.	0.00638
5.3	-0.01913	46.1	0.00638
5.4	-0.01913	46.2	0.00638
5.5	-0.01594	46.3	0.00319
5.6	-0.01913	46.4	0.00319
5.7	-0.02232	46.5	0.00957
5.8	-0.02232	46.6	0.00957
5.9	-0.01913	46.7	0.00319
6.	-0.02232	46.8	0.00638
6.1	-0.02232	46.9	0.00638
6.2	-0.02232	47.	0.00957
6.3	-0.02232	47.1	0.00638
6.4	-0.02232	47.2	0.00638
6.5	-0.02551	47.3	0.00638
6.6	-0.02232	47.4	0.01276
6.7	-0.02232	47.5	0.00638
6.8	-0.02551	47.6	0.00957
6.9	-0.02232	47.7	0.00638
7.	-0.02869	47.8	0.00638
7.1	-0.02232	47.9	0.00638
7.2	-0.02232	48.	0.00638
7.3	-0.02551	48.1	0.00638
7.4	-0.02551	48.2	0.00638
7.5	-0.02551	48.3	0.00957
7.6	-0.02869	48.4	0.00638
7.7	-0.03507	48.5	0.00957
7.8	-0.02869	48.6	0.01276
7.9	-0.02551	48.7	0.00957
8.	-0.02869	48.8	0.00638
8.1	-0.02232	48.9	0.00957
8.2	-0.02551	49.	0.00319
8.3	-0.02551	49.1	0.00319
8.4	-0.02869	49.2	0.00957
8.5	-0.02869	49.3	0.00319
8.6	-0.02869	49.4	0.00638
8.7	-0.02869	49.5	0.01276
8.8	-0.02551	49.6	0.00638
8.9	-0.02551	49.7	0.00957
9.	-0.03507	49.8	0.00638
9.1	-0.02551	49.9	0.01276
9.2	-0.02869	50.	0.00319
9.3	-0.02869	50.1	0.00638
9.4	-0.03188	50.2	0.00957

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.02869	50.3	0.00957
9.6	-0.02869	50.4	0.01276
9.7	-0.02551	50.5	0.00957
9.8	-0.02551	50.6	0.00957
9.9	-0.03188	50.7	0.00957
10.	-0.02551	50.8	0.00319
10.1	-0.02869	50.9	0.00957
10.2	-0.02551	51.	0.00638
10.3	-0.02869	51.1	0.00957
10.4	-0.03188	51.2	0.00319
10.5	-0.03188	51.3	0.00638
10.6	-0.03188	51.4	0.00957
10.7	-0.02551	51.5	0.00957
10.8	-0.02232	51.6	0.00319
10.9	-0.02551	51.7	0.00638
11.	-0.02232	51.8	0.00957
11.1	-0.01913	51.9	0.00957
11.2	-0.02551	52.	0.00957
11.3	-0.02232	52.1	0.00957
11.4	-0.02551	52.2	0.00957
11.5	-0.02869	52.3	0.01276
11.6	-0.02551	52.4	0.01276
11.7	-0.02551	52.5	0.00957
11.8	-0.02869	52.6	0.00638
11.9	-0.02869	52.7	0.00638
12.	-0.02869	52.8	0.00319
12.1	-0.02551	52.9	0.00638
12.2	-0.03188	53.	0.00638
12.3	-0.02232	53.1	0.00957
12.4	-0.02869	53.2	0.00638
12.5	-0.02869	53.3	0.00638
12.6	-0.02551	53.4	0.00319
12.7	-0.02551	53.5	0.00638
12.8	-0.02551	53.6	0.00319
12.9	-0.02551	53.7	0.00638
13.	-0.02869	53.8	0.00319
13.1	-0.02551	53.9	0.00638
13.2	-0.02232	54.	0.00957
13.3	-0.01275	54.1	0.00319
13.4	-0.00956	54.2	0.00957
13.5	-0.01913	54.3	0.00957
13.6	-0.02551	54.4	0.00638
13.7	-0.01913	54.5	0.00638
13.8	-0.02551	54.6	0.00957
13.9	-0.01913	54.7	0.00319
14.	-0.01913	54.8	0.00638
14.1	-0.02232	54.9	0.
14.2	-0.01913	55.	0.00638
14.3	-0.01913	55.1	0.00957
14.4	-0.01913	55.2	0.00957
14.5	-0.01913	55.3	0.00638
14.6	-0.01594	55.4	0.
14.7	-0.01275	55.5	0.00638
14.8	-0.02232	55.6	0.00957
14.9	-0.01913	55.7	0.00319
15.	-0.01913	55.8	0.00957
15.1	-0.01913	55.9	0.00957
15.2	-0.01913	56.	0.00957
15.3	-0.01594	56.1	0.00319
15.4	-0.01594	56.2	0.00319
15.5	-0.02232	56.3	0.00319
15.6	-0.01913	56.4	0.01276
15.7	-0.01913	56.5	0.00638
15.8	-0.01913	56.6	0.00638
15.9	-0.01913	56.7	0.00319
16.	-0.01913	56.8	0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.01594	56.9	0.00957
16.2	-0.01594	57.	0.00319
16.3	-0.01275	57.1	0.00319
16.4	-0.01594	57.2	0.00638
16.5	-0.01275	57.3	0.00957
16.6	-0.01594	57.4	0.00957
16.7	-0.01913	57.5	0.00319
16.8	-0.01913	57.6	0.00638
16.9	-0.01594	57.7	0.00957
17.	-0.01913	57.8	0.00638
17.1	-0.01913	57.9	0.00957
17.2	-0.01913	58.	0.00319
17.3	-0.01594	58.1	0.00638
17.4	-0.00956	58.2	0.00319
17.5	-0.01594	58.3	0.00638
17.6	-0.01594	58.4	0.00638
17.7	-0.01275	58.5	0.00319
17.8	-0.01275	58.6	0.00638
17.9	-0.01594	58.7	0.
18.	-0.01275	58.8	0.00638
18.1	-0.01913	58.9	0.00638
18.2	-0.00956	59.	0.00638
18.3	-0.01275	59.1	0.00957
18.4	-0.00637	59.2	0.00638
18.5	-0.00956	59.3	0.00319
18.6	-0.01275	59.4	0.00638
18.7	-0.00956	59.5	0.00319
18.8	-0.01275	59.6	0.00319
18.9	-0.00956	59.7	0.00319
19.	-0.01275	59.8	0.00957
19.1	-0.00956	59.9	0.00957
19.2	-0.00956	60.	0.00638
19.3	-0.01275	60.1	0.00957
19.4	-0.00956	60.2	0.00638
19.5	-0.01594	60.3	0.00638
19.6	-0.02551	60.4	0.00638
19.7	-0.02232	60.5	0.00957
19.8	-0.02232	60.6	0.00638
19.9	-0.01594	60.7	0.00319
20.	-0.01594	60.8	0.00638
20.1	-0.01913	60.9	0.00319
20.2	-0.01594	61.	0.00638
20.3	-0.01275	61.1	0.00319
20.4	-0.01594	61.2	0.00638
20.5	-0.01594	61.3	0.00957
20.6	-0.01594	61.4	0.00638
20.7	-0.00956	61.5	-0.00319
20.8	-0.01275	61.6	0.
20.9	-0.01594	61.7	0.00319
21.	-0.01275	61.8	0.00319
21.1	-0.01594	61.9	0.00638
21.2	-0.00956	62.	0.
21.3	-0.00956	62.1	0.00319
21.4	-0.01594	62.2	0.00957
21.5	-0.01275	62.3	0.00957
21.6	0.	62.4	0.00638
21.7	-0.00637	62.5	0.
21.8	-0.00637	62.6	0.00638
21.9	-0.00956	62.7	0.00957
22.	-0.00956	62.8	0.00957
22.1	-0.01275	62.9	0.00319
22.2	-0.00637	63.	0.00638
22.3	-0.00956	63.1	0.00957
22.4	-0.00637	63.2	0.00638
22.5	-0.00637	63.3	0.00638
22.6	-0.00956	63.4	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.00956	63.5	0.00957
22.8	-0.00956	63.6	0.00319
22.9	-0.00319	63.7	0.00957
23.	-0.00637	63.8	0.00319
23.1	0.	63.9	0.00638
23.2	-0.00637	64.	0.00319
23.3	-0.00637	64.1	0.00319
23.4	-0.00637	64.2	0.01276
23.5	-0.00956	64.3	0.00957
23.6	-0.00637	64.4	0.00638
23.7	0.00319	64.5	0.00638
23.8	-0.00319	64.6	0.00638
23.9	-0.00319	64.7	0.01276
24.	-0.00319	64.8	0.00319
24.1	-0.00637	64.9	0.00638
24.2	0.00319	65.	0.00957
24.3	0.	65.1	0.01276
24.4	-0.00319	65.2	0.00319
24.5	-0.00637	65.3	0.00957
24.6	0.	65.4	0.00957
24.7	-0.00319	65.5	0.00957
24.8	-0.00637	65.6	0.00319
24.9	-0.00319	65.7	0.00638
25.	0.00319	65.8	0.00957
25.1	-0.00319	65.9	0.00319
25.2	-0.00956	66.	0.01276
25.3	0.	66.1	0.00957
25.4	-0.00319	66.2	0.00638
25.5	0.	66.3	0.00319
25.6	-0.00319	66.4	0.00638
25.7	0.	66.5	0.00638
25.8	0.	66.6	0.00638
25.9	0.	66.7	0.00638
26.	0.	66.8	0.00319
26.1	-0.00319	66.9	0.00957
26.2	-0.00637	67.	0.00638
26.3	0.	67.1	0.00638
26.4	0.	67.2	0.00319
26.5	-0.00319	67.3	0.00319
26.6	-0.00637	67.4	0.00638
26.7	-0.00319	67.5	0.00638
26.8	-0.00319	67.6	0.00638
26.9	0.	67.7	0.00638
27.	0.	67.8	0.00638
27.1	0.	67.9	0.00957
27.2	-0.00319	68.	0.
27.3	-0.00956	68.1	0.00638
27.4	-0.00319	68.2	0.00638
27.5	0.00319	68.3	0.00638
27.6	0.	68.4	0.00638
27.7	0.	68.5	0.00638
27.8	0.00319	68.6	0.00319
27.9	0.00319	68.7	0.00638
28.	0.	68.8	0.00957
28.1	0.	68.9	0.00319
28.2	0.	69.	0.00957
28.3	0.00319	69.1	0.00957
28.4	-0.00637	69.2	0.00957
28.5	0.00638	69.3	0.00957
28.6	0.	69.4	0.00319
28.7	0.	69.5	0.01276
28.8	0.00319	69.6	0.00957
28.9	0.00319	69.7	0.00957
29.	0.00319	69.8	0.00638
29.1	0.00319	69.9	0.00957
29.2	0.00319	70.	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	0.	70.1	0.01595
29.4	0.	70.2	0.00957
29.5	0.00319	70.3	0.00319
29.6	0.	70.4	0.00638
29.7	0.00638	70.5	0.00638
29.8	0.	70.6	0.00638
29.9	-0.00319	70.7	0.00638
30.	0.	70.8	0.00638
30.1	0.	70.9	0.
30.2	-0.00319	71.	0.00638
30.3	0.00319	71.1	0.00638
30.4	0.00319	71.2	0.00638
30.5	0.00319	71.3	0.00638
30.6	0.	71.4	0.00638
30.7	-0.00319	71.5	0.00319
30.8	0.00319	71.6	0.00638
30.9	0.00319	71.7	0.00319
31.	0.	71.8	0.00638
31.1	0.00319	71.9	0.00638
31.2	0.	72.	0.00957
31.3	0.	72.1	0.00638
31.4	0.	72.2	0.01276
31.5	0.00319	72.3	0.00957
31.6	0.	72.4	0.00638
31.7	0.00319	72.5	0.00319
31.8	0.	72.6	0.00638
31.9	0.00319	72.7	0.00638
32.	0.00319	72.8	0.00638
32.1	0.	72.9	0.00638
32.2	0.00319	73.	0.00319
32.3	0.00319	73.1	0.00957
32.4	0.00319	73.2	0.01276
32.5	0.00319	73.3	0.01276
32.6	0.	73.4	0.00638
32.7	0.00319	73.5	0.00638
32.8	0.	73.6	0.01276
32.9	0.00319	73.7	0.01276
33.	0.00319	73.8	0.00957
33.1	0.00319	73.9	0.01276
33.2	0.	74.	0.00638
33.3	0.00319	74.1	0.00638
33.4	0.00638	74.2	0.00957
33.5	0.00638	74.3	0.01276
33.6	0.	74.4	0.00957
33.7	0.	74.5	0.00638
33.8	0.00319	74.6	0.00957
33.9	0.00319	74.7	0.01595
34.	0.	74.8	0.00638
34.1	0.00319	74.9	0.00638
34.2	0.00319	75.	0.00957
34.3	0.00638	75.1	0.01276
34.4	0.00319	75.2	0.00957
34.5	0.00319	75.3	0.01276
34.6	0.00319	75.4	0.00319
34.7	0.00957	75.5	0.00638
34.8	0.00638	75.6	0.00957
34.9	0.00319	75.7	0.00957
35.	0.00638	75.8	0.00957
35.1	0.00638	75.9	0.00638
35.2	0.00319	76.	0.00957
35.3	0.00319	76.1	0.00957
35.4	0.00319	76.2	0.00638
35.5	0.00319	76.3	0.00638
35.6	0.	76.4	0.01276
35.7	0.	76.5	0.00638
35.8	0.	76.6	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
35.9	0.	76.7	0.01276
36.	0.	76.8	0.00957
36.1	0.00638	76.9	0.00957
36.2	0.00319	77.	0.01276
36.3	0.	77.1	0.00957
36.4	0.00319	77.2	0.00957
36.5	0.00638	77.3	0.01276
36.6	0.00319	77.4	0.01595
36.7	0.00319	77.5	0.00319
36.8	0.00638	77.6	0.01276
36.9	0.00319	77.7	0.00957
37.	0.	77.8	0.00638
37.1	0.00319	77.9	0.00319
37.2	0.00638	78.	0.01276
37.3	0.00319	78.1	0.00319
37.4	0.00638	78.2	0.00957
37.5	0.	78.3	0.00638
37.6	0.00319	78.4	0.00638
37.7	0.00319	78.5	0.00319
37.8	0.00957	78.6	0.00319
37.9	0.00638	78.7	0.00957
38.	0.00638	78.8	0.00319
38.1	0.00957	78.9	0.00638
38.2	0.00319	79.	0.01276
38.3	0.	79.1	0.01276
38.4	0.00957	79.2	0.00319
38.5	0.00638	79.3	0.00957
38.6	0.00319	79.4	0.00638
38.7	0.00638	79.5	0.01595
38.8	0.00319	79.6	0.00638
38.9	0.	79.7	0.00638
39.	0.00957	79.8	0.00957
39.1	0.00638	79.9	0.01595
39.2	0.00638	80.	0.00957
39.3	0.00638	80.1	0.01276
39.4	0.00638	80.2	0.00319
39.5	0.00638	80.3	0.00638
39.6	0.00957	80.4	0.01276
39.7	0.	80.5	0.01276
39.8	0.00319	80.6	0.00319
39.9	0.00957	80.7	0.00638
40.	0.00957	80.8	0.01276
40.1	0.00638	80.9	0.01595
40.2	0.01276	81.	0.00638
40.3	0.00638	81.1	0.00319
40.4	0.00638	81.2	0.00638
40.5	0.00638	81.3	0.01276
40.6	0.	81.4	0.00638
40.7	0.00319		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 5.666

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	7.154	ft/day
Le	0.3441	ft

K = 0.002524 cm/sec

T = K*b = 144.2 ft²/day (1.551 sq. cm/sec)
Le = 0.3441 ft
Solution is critically damped when C(D) = 1.

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	7.154	0.02417	+/- 0.04744	296.	ft/day
Le	0.3441	0.03649	+/- 0.07163	9.428	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

K = 0.002524 cm/sec
T = K*b = 144.2 ft²/day (1.551 sq. cm/sec)
Le = 0.3441 ft
Solution is critically damped when C(D) = 1.

Parameter Correlations

	K	Le
K	1.00	0.01
Le	0.01	1.00

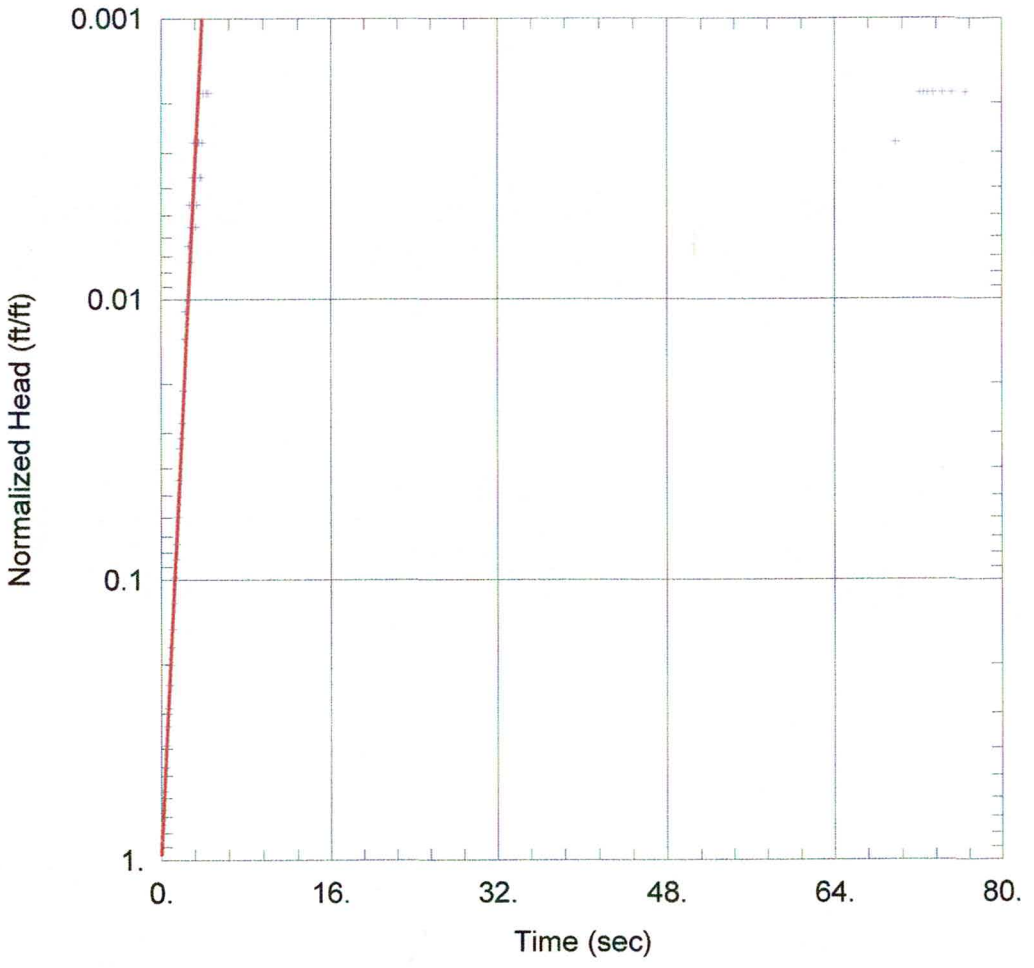
Residual Statistics

for weighted residuals

Sum of Squares . . . . . 0.1222 ft^2
Variance . . . . . 0.0001503 ft^2
Std. Deviation . . . . . 0.01226 ft
Mean . . . . . -0.0009134 ft
No. of Residuals 815
No. of Estimates 2

NOTES

Well Pressure = 56 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T59_Test3Hvorslev.aqt
Date: 02/14/13 Time: 08:56:00

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T59
Test Date: 02/07/13

AQUIFER DATA

Saturated Thickness: 20.16 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T59)

Initial Displacement: 3.48 ft
Total Well Penetration Depth: 24.52 ft
Casing Radius: 0.02083 ft
Static Water Column Height: 20.16 ft
Screen Length: 20. ft
Well Radius: 0.0833 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 9.313 ft/day
y0 = 3.315 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 08:59:15

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/13
Test Well: T59

AQUIFER DATA

Saturated Thickness: 20.16 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T59

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 3.48 ft
Static Water Column Height: 20.16 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 20. ft
Total Well Penetration Depth: 24.52 ft

No. of Observations: 770

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	3.482	38.5	-0.00957
0.1	2.589	38.6	-0.00638
0.2	2.289	38.7	-0.00638
0.3	1.971	38.8	-0.00638
0.4	1.613	38.9	-0.01276
0.5	1.352	39.	-0.01276
0.6	1.154	39.1	-0.00319
0.7	0.9949	39.2	-0.00319
0.8	0.8227	39.3	0.00319
0.9	0.6983	39.4	-0.00319
1.	0.6027	39.5	-0.00638
1.1	0.5198	39.6	-0.00638
1.2	0.4209	39.7	-0.00638
1.3	0.3412	39.8	-0.00319
1.4	0.2934	39.9	-0.00319
1.5	0.2583	40.	0.
1.6	0.2073	40.1	-0.00319
1.7	0.1531	40.2	-0.00319
1.8	0.118	40.3	-0.00319
1.9	0.1084	40.4	-0.00638
2.	0.09566	40.5	-0.00638
2.1	0.07334	40.6	-0.00319
2.2	0.04783	40.7	-0.00319
2.3	0.03826	40.8	-0.00319
2.4	0.03826	40.9	-0.00638
2.5	0.03507	41.	0.
2.6	0.02232	41.1	-0.00319
2.7	0.01594	41.2	-0.00638
2.8	0.02551	41.3	-0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	0.01913	41.4	0.
3.	0.01275	41.5	-0.00319
3.1	0.00956	41.6	-0.00319
3.2	0.00956	41.7	0.
3.3	0.01913	41.8	-0.00638
3.4	0.01594	41.9	-0.00638
3.5	0.00956	42.	-0.00319
3.6	0.00956	42.1	-0.00638
3.7	0.01275	42.2	-0.00638
3.8	0.01275	42.3	-0.00319
3.9	0.00956	42.4	-0.00638
4.	0.00638	42.5	-0.00319
4.1	0.00319	42.6	-0.00319
4.2	0.	42.7	-0.01276
4.3	0.00638	42.8	-0.00638
4.4	-0.00319	42.9	-0.00957
4.5	0.00638	43.	-0.00638
4.6	-0.00319	43.1	0.
4.7	0.00319	43.2	-0.00638
4.8	-0.00319	43.3	-0.00319
4.9	-0.00319	43.4	0.
5.	0.	43.5	-0.00319
5.1	0.	43.6	-0.00638
5.2	-0.00319	43.7	-0.00319
5.3	0.00319	43.8	-0.00319
5.4	-0.00319	43.9	-0.00319
5.5	-0.00638	44.	-0.00638
5.6	0.00319	44.1	-0.00319
5.7	0.	44.2	-0.00319
5.8	-0.00957	44.3	-0.00638
5.9	-0.00638	44.4	-0.00319
6.	-0.00638	44.5	-0.00319
6.1	-0.00638	44.6	-0.00319
6.2	-0.00957	44.7	0.
6.3	-0.01276	44.8	-0.00638
6.4	-0.00957	44.9	-0.00319
6.5	-0.00957	45.	-0.00319
6.6	-0.01276	45.1	0.
6.7	-0.00638	45.2	-0.00638
6.8	-0.01276	45.3	-0.00638
6.9	-0.01595	45.4	-0.01276
7.	-0.01276	45.5	-0.00957
7.1	-0.01595	45.6	-0.00319
7.2	-0.00638	45.7	0.
7.3	-0.01276	45.8	-0.00638
7.4	-0.01913	45.9	-0.00638
7.5	-0.00957	46.	0.
7.6	-0.00957	46.1	-0.00319
7.7	-0.01595	46.2	-0.00957
7.8	-0.01276	46.3	-0.00319
7.9	-0.01276	46.4	-0.00319
8.	-0.01913	46.5	-0.00638
8.1	-0.01595	46.6	0.00319
8.2	-0.01595	46.7	-0.00319
8.3	-0.01595	46.8	-0.00957
8.4	-0.01595	46.9	-0.00319
8.5	-0.01595	47.	0.
8.6	-0.01913	47.1	-0.00319
8.7	-0.01276	47.2	-0.00319
8.8	-0.01276	47.3	0.
8.9	-0.01595	47.4	-0.00957
9.	-0.01276	47.5	-0.00638
9.1	-0.00957	47.6	-0.00638
9.2	-0.01913	47.7	0.
9.3	-0.01276	47.8	-0.00638
9.4	-0.01913	47.9	-0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00957	48.	-0.00638
9.6	-0.01913	48.1	-0.00957
9.7	-0.01276	48.2	-0.00319
9.8	-0.01276	48.3	-0.00319
9.9	-0.01276	48.4	0.00319
10.	-0.01913	48.5	-0.00638
10.1	-0.01913	48.6	-0.00319
10.2	-0.01595	48.7	0.
10.3	-0.01276	48.8	0.
10.4	-0.01276	48.9	-0.00319
10.5	-0.01595	49.	-0.00319
10.6	-0.01595	49.1	0.
10.7	-0.01276	49.2	0.
10.8	-0.01595	49.3	-0.00319
10.9	-0.02232	49.4	-0.00638
11.	-0.01276	49.5	-0.00319
11.1	-0.01595	49.6	-0.00319
11.2	-0.01595	49.7	-0.00319
11.3	-0.01595	49.8	-0.00638
11.4	-0.01276	49.9	-0.00319
11.5	-0.01595	50.	-0.00957
11.6	-0.01595	50.1	-0.00319
11.7	-0.01276	50.2	0.
11.8	-0.01595	50.3	-0.00319
11.9	-0.01913	50.4	0.
12.	-0.01595	50.5	0.00319
12.1	-0.01595	50.6	-0.00638
12.2	-0.01276	50.7	-0.00319
12.3	-0.01913	50.8	-0.00319
12.4	-0.01276	50.9	0.
12.5	-0.01913	51.	-0.00638
12.6	-0.01595	51.1	-0.00319
12.7	-0.01595	51.2	0.00319
12.8	-0.01276	51.3	0.
12.9	-0.01595	51.4	-0.00319
13.	-0.00957	51.5	-0.00319
13.1	-0.01595	51.6	-0.00319
13.2	-0.01595	51.7	-0.00319
13.3	-0.01276	51.8	-0.00638
13.4	-0.01276	51.9	0.
13.5	-0.00957	52.	-0.00957
13.6	-0.01595	52.1	0.
13.7	-0.01913	52.2	-0.00319
13.8	-0.01595	52.3	0.
13.9	-0.01913	52.4	-0.00319
14.	-0.01913	52.5	0.00319
14.1	-0.01595	52.6	-0.00319
14.2	-0.01913	52.7	0.00319
14.3	-0.01595	52.8	0.00319
14.4	-0.01595	52.9	0.
14.5	-0.01913	53.	-0.00319
14.6	-0.01276	53.1	-0.00319
14.7	-0.01595	53.2	0.00319
14.8	-0.01913	53.3	-0.00319
14.9	-0.01595	53.4	-0.00638
15.	-0.01913	53.5	-0.00957
15.1	-0.01276	53.6	-0.00319
15.2	-0.01595	53.7	0.
15.3	-0.01913	53.8	0.
15.4	-0.01595	53.9	-0.00319
15.5	-0.01913	54.	-0.00319
15.6	-0.01595	54.1	-0.00319
15.7	-0.01595	54.2	0.
15.8	-0.01595	54.3	-0.00957
15.9	-0.01595	54.4	-0.00638
16.	-0.02232	54.5	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.01595	54.6	-0.00319
16.2	-0.02232	54.7	0.
16.3	-0.01913	54.8	-0.00638
16.4	-0.01276	54.9	-0.00319
16.5	-0.01913	55.	0.
16.6	-0.01595	55.1	0.
16.7	-0.01913	55.2	-0.00638
16.8	-0.02232	55.3	-0.00638
16.9	-0.01913	55.4	0.00319
17.	-0.01595	55.5	-0.00319
17.1	-0.01595	55.6	0.00319
17.2	-0.01913	55.7	0.
17.3	-0.01595	55.8	0.
17.4	-0.01276	55.9	0.
17.5	-0.01913	56.	-0.00319
17.6	-0.01595	56.1	0.
17.7	-0.02232	56.2	-0.00319
17.8	-0.01913	56.3	0.00319
17.9	-0.01913	56.4	-0.00319
18.	-0.01913	56.5	-0.00319
18.1	-0.01913	56.6	-0.00319
18.2	-0.01595	56.7	0.00319
18.3	-0.01595	56.8	-0.00638
18.4	-0.02232	56.9	0.
18.5	-0.01913	57.	-0.00319
18.6	-0.01913	57.1	0.00319
18.7	-0.01595	57.2	-0.00319
18.8	-0.01595	57.3	0.
18.9	-0.02232	57.4	0.00319
19.	-0.02232	57.5	0.
19.1	-0.02551	57.6	-0.00319
19.2	-0.01913	57.7	-0.00319
19.3	-0.01595	57.8	-0.00319
19.4	-0.01913	57.9	0.
19.5	-0.01913	58.	0.
19.6	-0.01913	58.1	-0.00319
19.7	-0.01595	58.2	-0.00638
19.8	-0.01913	58.3	0.00319
19.9	-0.01913	58.4	-0.00319
20.	-0.02232	58.5	0.
20.1	-0.01913	58.6	0.00319
20.2	-0.02232	58.7	-0.00638
20.3	-0.01913	58.8	0.
20.4	-0.01913	58.9	-0.00319
20.5	-0.01913	59.	-0.00319
20.6	-0.01276	59.1	0.
20.7	-0.01913	59.2	0.
20.8	-0.01276	59.3	-0.00319
20.9	-0.01595	59.4	-0.00319
21.	-0.01913	59.5	0.
21.1	-0.01913	59.6	0.00319
21.2	-0.01913	59.7	-0.00319
21.3	-0.01595	59.8	0.
21.4	-0.01913	59.9	-0.00319
21.5	-0.01595	60.	0.
21.6	-0.01595	60.1	0.
21.7	-0.00638	60.2	0.
21.8	-0.00957	60.3	0.
21.9	-0.01913	60.4	-0.00319
22.	-0.01595	60.5	0.
22.1	-0.01276	60.6	0.
22.2	-0.01595	60.7	-0.00319
22.3	-0.02232	60.8	0.
22.4	-0.01913	60.9	-0.00638
22.5	-0.01276	61.	0.
22.6	-0.01913	61.1	-0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.01595	61.2	0.00319
22.8	-0.01595	61.3	-0.00319
22.9	-0.00957	61.4	-0.00319
23.	-0.01276	61.5	0.00319
23.1	-0.01595	61.6	-0.00638
23.2	-0.02232	61.7	-0.00319
23.3	-0.01913	61.8	0.00319
23.4	-0.01595	61.9	0.
23.5	-0.01276	62.	-0.00319
23.6	-0.01276	62.1	-0.00319
23.7	-0.01276	62.2	-0.00319
23.8	-0.00957	62.3	0.
23.9	-0.01595	62.4	0.
24.	-0.01595	62.5	0.
24.1	-0.00638	62.6	-0.00319
24.2	-0.00957	62.7	0.
24.3	-0.01276	62.8	0.
24.4	-0.01276	62.9	0.
24.5	-0.01276	63.	0.
24.6	-0.00957	63.1	0.
24.7	-0.01595	63.2	-0.00319
24.8	-0.01276	63.3	-0.00638
24.9	-0.00957	63.4	0.00319
25.	-0.01276	63.5	0.00319
25.1	-0.01276	63.6	0.00319
25.2	-0.00957	63.7	0.
25.3	-0.00638	63.8	0.00319
25.4	-0.01276	63.9	0.
25.5	-0.01276	64.	0.
25.6	-0.01276	64.1	0.00319
25.7	-0.00957	64.2	-0.00638
25.8	-0.00957	64.3	0.00319
25.9	-0.01276	64.4	0.00319
26.	-0.00957	64.5	0.
26.1	-0.00957	64.6	0.00319
26.2	-0.01276	64.7	-0.00319
26.3	-0.00957	64.8	0.
26.4	-0.01276	64.9	0.00319
26.5	-0.00957	65.	-0.00319
26.6	-0.00638	65.1	0.
26.7	-0.01276	65.2	0.00319
26.8	-0.01276	65.3	-0.00319
26.9	-0.01276	65.4	-0.00319
27.	-0.00957	65.5	-0.00319
27.1	-0.01276	65.6	-0.00319
27.2	-0.01276	65.7	0.
27.3	-0.00638	65.8	0.
27.4	-0.00957	65.9	0.
27.5	-0.00957	66.	-0.00319
27.6	-0.00957	66.1	0.
27.7	-0.00638	66.2	0.
27.8	-0.00957	66.3	0.
27.9	-0.01276	66.4	-0.00319
28.	-0.00638	66.5	0.
28.1	-0.00957	66.6	0.
28.2	-0.00638	66.7	0.
28.3	-0.00957	66.8	0.00319
28.4	-0.00638	66.9	0.
28.5	-0.00319	67.	-0.00319
28.6	-0.00638	67.1	0.
28.7	-0.00957	67.2	0.
28.8	-0.00638	67.3	-0.00319
28.9	-0.00638	67.4	0.
29.	-0.00638	67.5	-0.00319
29.1	-0.00638	67.6	0.
29.2	-0.00638	67.7	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	-0.00957	67.8	0.00319
29.4	-0.00638	67.9	0.00319
29.5	-0.00319	68.	0.
29.6	-0.00957	68.1	0.
29.7	-0.00638	68.2	0.
29.8	-0.00638	68.3	0.
29.9	-0.00638	68.4	-0.00638
30.	-0.00638	68.5	0.00319
30.1	-0.00638	68.6	0.
30.2	-0.00319	68.7	-0.00638
30.3	-0.00319	68.8	0.00319
30.4	-0.00319	68.9	0.00319
30.5	-0.00638	69.	0.
30.6	-0.00319	69.1	0.
30.7	-0.00638	69.2	0.00319
30.8	-0.00957	69.3	0.
30.9	-0.00957	69.4	0.00319
31.	-0.00638	69.5	-0.00638
31.1	-0.00638	69.6	0.
31.2	-0.00957	69.7	0.00319
31.3	-0.00319	69.8	0.00956
31.4	-0.00638	69.9	0.
31.5	-0.00638	70.	0.
31.6	-0.00957	70.1	-0.00319
31.7	-0.00957	70.2	0.
31.8	-0.00638	70.3	-0.00319
31.9	-0.00638	70.4	0.
32.	-0.00638	70.5	0.
32.1	-0.00638	70.6	0.
32.2	-0.00957	70.7	-0.00319
32.3	-0.00319	70.8	-0.00638
32.4	-0.00638	70.9	-0.00319
32.5	-0.00638	71.	0.
32.6	-0.00957	71.1	0.
32.7	-0.00319	71.2	0.
32.8	0.	71.3	0.00319
32.9	-0.00319	71.4	0.
33.	-0.00957	71.5	0.
33.1	-0.00957	71.6	0.
33.2	-0.00638	71.7	0.
33.3	-0.00319	71.8	-0.00319
33.4	-0.00957	71.9	0.00319
33.5	-0.00638	72.	0.00319
33.6	-0.00319	72.1	0.00638
33.7	-0.00957	72.2	-0.00319
33.8	-0.00638	72.3	0.
33.9	-0.00638	72.4	0.00638
34.	-0.00319	72.5	0.
34.1	-0.00638	72.6	0.
34.2	-0.00319	72.7	-0.00638
34.3	-0.00957	72.8	0.00638
34.4	-0.00638	72.9	-0.00319
34.5	0.	73.	-0.00319
34.6	-0.00319	73.1	0.
34.7	-0.01276	73.2	0.
34.8	-0.00638	73.3	0.00638
34.9	-0.00319	73.4	0.
35.	0.	73.5	-0.00319
35.1	-0.01276	73.6	0.
35.2	-0.00319	73.7	0.00319
35.3	-0.00957	73.8	0.
35.4	-0.00319	73.9	-0.00319
35.5	-0.00638	74.	0.
35.6	-0.00319	74.1	-0.00319
35.7	-0.00319	74.2	0.00638
35.8	0.	74.3	-0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
35.9	-0.00957	74.4	-0.00319
36.	-0.00319	74.5	0.
36.1	0.	74.6	0.00319
36.2	-0.00638	74.7	0.00319
36.3	-0.00957	74.8	-0.00319
36.4	-0.00638	74.9	0.
36.5	-0.00638	75.	-0.00319
36.6	-0.00957	75.1	0.00638
36.7	-0.00319	75.2	0.00319
36.8	-0.00638	75.3	0.
36.9	-0.00319	75.4	-0.00319
37.	-0.00638	75.5	-0.00638
37.1	-0.00957	75.6	0.
37.2	-0.00319	75.7	0.00319
37.3	-0.00638	75.8	0.
37.4	-0.00957	75.9	0.
37.5	-0.00319	76.	0.
37.6	-0.00638	76.1	-0.00319
37.7	-0.00319	76.2	0.00319
37.8	-0.00638	76.3	0.00319
37.9	-0.00319	76.4	0.00638
38.	-0.00319	76.5	0.00319
38.1	0.	76.6	-0.00319
38.2	0.	76.7	-0.00319
38.3	-0.00638	76.8	0.
38.4	-0.00957	76.9	0.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Hvorslev
Log Factor: 0.1365

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	9.313	ft/day
y0	3.315	ft

K = 0.003286 cm/sec
T = K*b = 187.8 ft²/day (2.019 sq. cm/sec)

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	9.313	0.04188	+/- 0.08222	222.4	ft/day
y0	3.315	0.009606	+/- 0.01886	345.1	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

K = 0.003286 cm/sec
T = K*b = 187.8 ft²/day (2.019 sq. cm/sec)

Parameter Correlations

	K	y0
K	1.00	0.64
y0	0.64	1.00

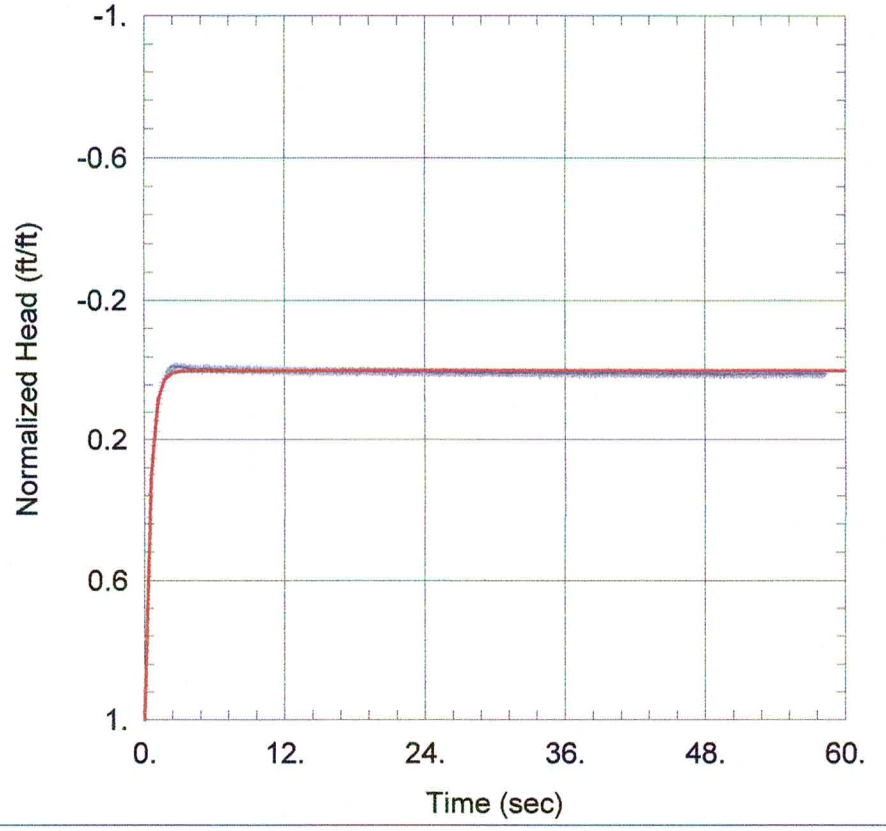
Residual Statistics

for weighted residuals

Sum of Squares . . . . . 0.1396 ft^2
Variance . . . . . 0.0001817 ft^2
Std. Deviation . . . . . 0.01348 ft
Mean . . . . . -0.006039 ft
No. of Residuals 770
No. of Estimates 2

NOTES

Well Pressure = 56 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T62_Test1Springer.aqt
Date: 02/12/13 Time: 14:29:43

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T62
Test Date: 02/07/13

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 11.32 ft/day
Le = 0.8531 ft

AQUIFER DATA

Saturated Thickness: 10.16 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T62)

Initial Displacement: 2.93 ft
Total Well Penetration Depth: 19.31 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 10.49 ft
Screen Length: 15. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:02:28

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/13
Test Well: T62

AQUIFER DATA

Saturated Thickness: 10.16 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T62

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.93 ft
Static Water Column Height: 10.49 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 15. ft
Total Well Penetration Depth: 19.31 ft

No. of Observations: 584

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.927	29.2	0.01276
0.1	2.669	29.3	0.01276
0.2	2.089	29.4	0.01276
0.3	1.722	29.5	0.01276
0.4	1.457	29.6	0.01595
0.5	1.234	29.7	0.01595
0.6	1.036	29.8	0.01914
0.7	0.8769	29.9	0.02551
0.8	0.7461	30.	0.00957
0.9	0.6314	30.1	0.01595
1.	0.5166	30.2	0.01914
1.1	0.4241	30.3	0.01595
1.2	0.3476	30.4	0.01595
1.3	0.2806	30.5	0.02232
1.4	0.2296	30.6	0.01914
1.5	0.169	30.7	0.01595
1.6	0.1244	30.8	0.01595
1.7	0.09566	30.9	0.01276
1.8	0.06378	31.	0.01595
1.9	0.03508	31.1	0.01914
2.	0.01595	31.2	0.02551
2.1	0.00319	31.3	0.01276
2.2	-0.00956	31.4	0.02232
2.3	-0.02551	31.5	0.01595
2.4	-0.02551	31.6	0.01595
2.5	-0.03826	31.7	0.01276
2.6	-0.03507	31.8	0.01914
2.7	-0.03507	31.9	0.01914
2.8	-0.04145	32.	0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.03826	32.1	0.01914
3.	-0.0287	32.2	0.01595
3.1	-0.03188	32.3	0.01276
3.2	-0.03507	32.4	0.01914
3.3	-0.03188	32.5	0.01914
3.4	-0.0287	32.6	0.01914
3.5	-0.03188	32.7	0.01276
3.6	-0.03188	32.8	0.02232
3.7	-0.01594	32.9	0.01595
3.8	-0.01913	33.	0.01914
3.9	-0.02551	33.1	0.01914
4.	-0.0287	33.2	0.01595
4.1	-0.00956	33.3	0.01595
4.2	-0.01913	33.4	0.01595
4.3	-0.01594	33.5	0.01914
4.4	-0.01913	33.6	0.01595
4.5	-0.01594	33.7	0.00957
4.6	-0.01275	33.8	0.02232
4.7	-0.01594	33.9	0.03508
4.8	-0.01594	34.	0.03508
4.9	-0.01913	34.1	0.01595
5.	-0.00319	34.2	0.01914
5.1	-0.02551	34.3	0.02232
5.2	-0.01913	34.4	0.01595
5.3	-0.02232	34.5	0.01595
5.4	-0.0287	34.6	0.01276
5.5	-0.02232	34.7	0.02232
5.6	-0.02232	34.8	0.02232
5.7	-0.01275	34.9	0.01595
5.8	-0.01275	35.	0.02232
5.9	-0.01594	35.1	0.02232
6.	-0.01913	35.2	0.01914
6.1	-0.01594	35.3	0.01595
6.2	-0.01275	35.4	0.02551
6.3	-0.00956	35.5	0.01276
6.4	-0.01594	35.6	0.01595
6.5	-0.01913	35.7	0.01595
6.6	-0.01275	35.8	0.01914
6.7	-0.01275	35.9	0.01276
6.8	-0.00637	36.	0.01914
6.9	0.	36.1	0.02551
7.	-0.01275	36.2	0.00319
7.1	-0.02551	36.3	0.02232
7.2	-0.01913	36.4	0.01914
7.3	-0.00956	36.5	0.01595
7.4	-0.00956	36.6	0.01914
7.5	-0.01594	36.7	0.02232
7.6	-0.01275	36.8	0.01595
7.7	-0.01275	36.9	0.01914
7.8	-0.00956	37.	0.01914
7.9	-0.01913	37.1	0.02232
8.	-0.01275	37.2	0.01595
8.1	-0.00319	37.3	0.0287
8.2	-0.00319	37.4	0.01276
8.3	-0.01275	37.5	0.00957
8.4	-0.00637	37.6	0.01595
8.5	-0.00956	37.7	0.02232
8.6	0.	37.8	0.02232
8.7	-0.00956	37.9	0.01914
8.8	-0.01594	38.	0.02551
8.9	-0.00956	38.1	0.01914
9.	-0.01275	38.2	0.02551
9.1	-0.02232	38.3	0.01914
9.2	-0.00637	38.4	0.02551
9.3	0.00319	38.5	0.01914
9.4	-0.00637	38.6	0.03189

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00956	38.7	0.02232
9.6	-0.00637	38.8	0.01914
9.7	-0.01594	38.9	0.01595
9.8	-0.00319	39.	0.02232
9.9	-0.00637	39.1	0.02232
10.	-0.00637	39.2	0.01276
10.1	-0.01275	39.3	0.02551
10.2	0.	39.4	0.01914
10.3	0.	39.5	0.01595
10.4	-0.00319	39.6	0.01276
10.5	-0.00319	39.7	0.02551
10.6	-0.00637	39.8	0.00638
10.7	-0.00637	39.9	0.01595
10.8	0.	40.	0.01914
10.9	-0.00956	40.1	0.01914
11.	-0.00637	40.2	0.01276
11.1	0.00638	40.3	0.02551
11.2	-0.00319	40.4	0.0287
11.3	-0.00637	40.5	0.01595
11.4	-0.00319	40.6	0.01595
11.5	-0.00637	40.7	0.01595
11.6	0.00638	40.8	0.01595
11.7	-0.00956	40.9	0.01595
11.8	-0.00319	41.	0.01914
11.9	-0.00319	41.1	0.01914
12.	0.00319	41.2	0.01595
12.1	0.	41.3	0.02232
12.2	-0.00319	41.4	0.01914
12.3	-0.00637	41.5	0.00957
12.4	0.00638	41.6	0.02232
12.5	0.	41.7	0.01595
12.6	0.	41.8	0.01914
12.7	0.00638	41.9	0.02551
12.8	0.	42.	0.02232
12.9	0.	42.1	0.02232
13.	0.	42.2	0.01276
13.1	0.00319	42.3	0.01595
13.2	0.00319	42.4	0.02232
13.3	0.	42.5	0.01276
13.4	0.00319	42.6	0.02551
13.5	-0.00319	42.7	0.00319
13.6	0.01276	42.8	0.02232
13.7	0.	42.9	0.01914
13.8	-0.00319	43.	0.01595
13.9	-0.00319	43.1	0.02551
14.	0.00319	43.2	0.01914
14.1	0.	43.3	0.02551
14.2	0.01914	43.4	0.02232
14.3	0.00319	43.5	0.02232
14.4	0.00957	43.6	0.02232
14.5	0.00319	43.7	0.01276
14.6	0.00319	43.8	0.02232
14.7	-0.00637	43.9	0.02551
14.8	0.00319	44.	0.02551
14.9	0.00319	44.1	0.0287
15.	0.00319	44.2	0.02551
15.1	0.00319	44.3	0.01914
15.2	0.00957	44.4	0.02232
15.3	0.00638	44.5	0.01914
15.4	0.00638	44.6	0.02232
15.5	0.00319	44.7	0.01595
15.6	0.00319	44.8	0.02232
15.7	0.00319	44.9	0.0287
15.8	0.00957	45.	0.01914
15.9	0.	45.1	0.01595
16.	0.00638	45.2	0.02232

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	0.00319	45.3	0.0287
16.2	0.00638	45.4	0.02551
16.3	0.	45.5	0.01914
16.4	0.	45.6	0.01595
16.5	0.01276	45.7	0.01914
16.6	0.00638	45.8	0.02232
16.7	0.	45.9	0.01595
16.8	0.01276	46.	0.02551
16.9	0.00638	46.1	0.01595
17.	0.	46.2	0.01914
17.1	0.00319	46.3	0.0287
17.2	0.00638	46.4	0.02551
17.3	0.00319	46.5	0.01595
17.4	0.01276	46.6	0.02232
17.5	0.	46.7	0.02232
17.6	0.00638	46.8	0.02232
17.7	0.00319	46.9	0.02232
17.8	0.00319	47.	0.01595
17.9	0.00319	47.1	0.0287
18.	0.00957	47.2	0.02232
18.1	0.00638	47.3	0.02551
18.2	0.01914	47.4	0.0287
18.3	0.00957	47.5	0.01914
18.4	0.00638	47.6	0.02551
18.5	0.00638	47.7	0.01595
18.6	0.00319	47.8	0.02551
18.7	0.00319	47.9	0.02232
18.8	0.	48.	0.02551
18.9	0.00638	48.1	0.02551
19.	0.00957	48.2	0.01595
19.1	0.00638	48.3	0.01276
19.2	-0.00637	48.4	0.0287
19.3	0.00638	48.5	0.01595
19.4	0.00638	48.6	0.02551
19.5	0.00957	48.7	0.02232
19.6	0.00957	48.8	0.03189
19.7	0.	48.9	0.02551
19.8	0.00319	49.	0.02232
19.9	0.01276	49.1	0.01914
20.	0.00638	49.2	0.02232
20.1	0.00957	49.3	0.02551
20.2	0.00638	49.4	0.03508
20.3	0.00638	49.5	0.01914
20.4	0.00638	49.6	0.02551
20.5	0.01276	49.7	0.03189
20.6	0.00957	49.8	0.01914
20.7	0.00957	49.9	0.02232
20.8	0.00957	50.	0.02551
20.9	0.00319	50.1	0.01914
21.	0.00638	50.2	0.0287
21.1	0.00638	50.3	0.01914
21.2	0.00957	50.4	0.02551
21.3	0.02232	50.5	0.03508
21.4	0.	50.6	0.02551
21.5	0.02232	50.7	0.02551
21.6	0.01914	50.8	0.02551
21.7	0.00638	50.9	0.01914
21.8	0.00638	51.	0.02551
21.9	0.00957	51.1	0.0287
22.	0.00638	51.2	0.02551
22.1	0.00957	51.3	0.02232
22.2	0.01276	51.4	0.02232
22.3	0.00638	51.5	0.02551
22.4	0.00638	51.6	0.02232
22.5	0.00638	51.7	0.02232
22.6	0.01595	51.8	0.01914

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	0.00638	51.9	0.01914
22.8	0.01276	52.	0.02232
22.9	0.01276	52.1	0.0287
23.	0.00638	52.2	0.02551
23.1	0.01595	52.3	0.0287
23.2	0.00957	52.4	0.02551
23.3	0.01276	52.5	0.02551
23.4	0.00319	52.6	0.02232
23.5	0.01595	52.7	0.0287
23.6	0.01595	52.8	0.02551
23.7	0.00957	52.9	0.02232
23.8	0.01595	53.	0.02232
23.9	0.00957	53.1	0.0287
24.	0.00638	53.2	0.0287
24.1	0.00319	53.3	0.0287
24.2	0.00957	53.4	0.01595
24.3	0.01595	53.5	0.0287
24.4	0.01595	53.6	0.02232
24.5	0.00957	53.7	0.02232
24.6	0.01276	53.8	0.01595
24.7	0.01276	53.9	0.02551
24.8	0.01276	54.	0.01595
24.9	0.01914	54.1	0.0287
25.	0.00957	54.2	0.02551
25.1	0.01914	54.3	0.02232
25.2	0.01276	54.4	0.01595
25.3	0.02551	54.5	0.0287
25.4	0.01595	54.6	0.0287
25.5	0.01276	54.7	0.02551
25.6	0.01276	54.8	0.02232
25.7	0.01276	54.9	0.02551
25.8	0.00638	55.	0.03189
25.9	0.01595	55.1	0.02551
26.	0.01276	55.2	0.01914
26.1	0.01595	55.3	0.01914
26.2	0.01595	55.4	0.01914
26.3	0.01595	55.5	0.01914
26.4	0.01276	55.6	0.02232
26.5	0.01276	55.7	0.02551
26.6	0.01595	55.8	0.02551
26.7	0.01276	55.9	0.01914
26.8	0.01276	56.	0.0287
26.9	0.00957	56.1	0.01595
27.	0.01914	56.2	0.03189
27.1	0.01595	56.3	0.02551
27.2	0.01276	56.4	0.01914
27.3	0.01595	56.5	0.02551
27.4	0.00638	56.6	0.02232
27.5	0.02232	56.7	0.01914
27.6	0.01595	56.8	0.02551
27.7	0.01914	56.9	0.02232
27.8	0.01914	57.	0.01914
27.9	0.00957	57.1	0.02232
28.	0.02232	57.2	0.02551
28.1	0.01276	57.3	0.02551
28.2	0.01276	57.4	0.02551
28.3	0.01595	57.5	0.02551
28.4	0.01276	57.6	0.01914
28.5	0.00638	57.7	0.0287
28.6	0.01914	57.8	0.0287
28.7	0.01276	57.9	0.02551
28.8	0.02232	58.	0.02551
28.9	0.01276	58.1	0.02232
29.	0.01914	58.2	0.02232
29.1	0.01595	58.3	0.02551

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.117

VISUAL ESTIMATION RESULTS

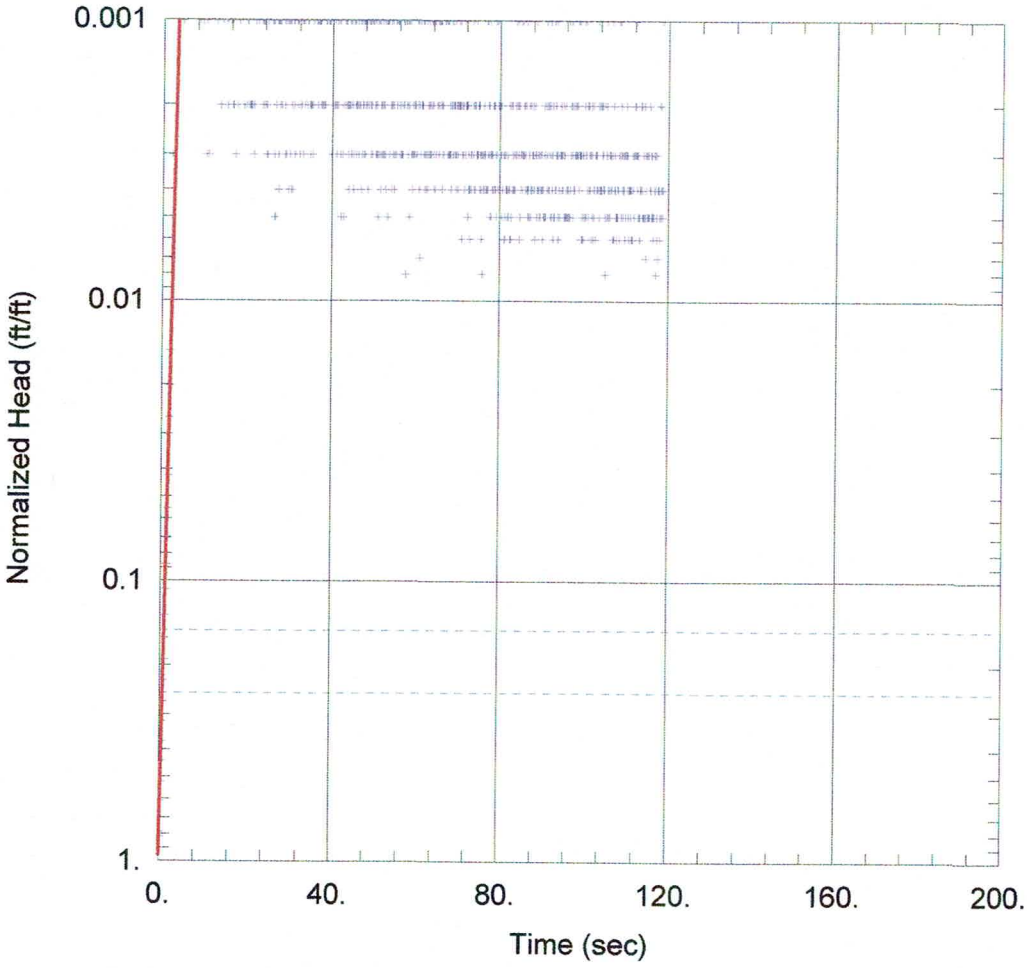
Estimated Parameters

Parameter	Estimate	
K	11.32	ft/day
Le	0.8531	ft

K = 0.003994 cm/sec
T = K*b = 115. ft²/day (1.237 sq. cm/sec)
Le = 0.8531 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 54 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T62_Test3Hvorslev.aqt
Date: 02/14/13 Time: 09:04:15

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T62
Test Date: 02/07/13

AQUIFER DATA

Saturated Thickness: 10.16 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T62)

Initial Displacement: 3.18 ft
Total Well Penetration Depth: 19.31 ft
Casing Radius: 0.02083 ft
Static Water Column Height: 10.49 ft
Screen Length: 15. ft
Well Radius: 0.0833 ft

SOLUTION

Aquifer Model: Unconfined
K = 14.83 ft/day
Solution Method: Hvorslev
y0 = 3.015 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:05:18

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/13
Test Well: T62

AQUIFER DATA

Saturated Thickness: 10.16 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T62

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 3.18 ft
Static Water Column Height: 10.49 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 15. ft
Total Well Penetration Depth: 19.31 ft

No. of Observations: 1189

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	3.182	59.5	0.00956
0.1	2.592	59.6	0.
0.2	2.497	59.7	0.00638
0.3	1.929	59.8	0.00638
0.4	1.655	59.9	0.00956
0.5	1.39	60.	-0.00638
0.6	1.186	60.1	0.00956
0.7	1.004	60.2	0.00319
0.8	0.8546	60.3	0.00319
0.9	0.7175	60.4	0.00638
1.	0.6059	60.5	0.
1.1	0.507	60.6	0.01275
1.2	0.4209	60.7	0.00319
1.3	0.3412	60.8	0.00638
1.4	0.2774	60.9	0.02232
1.5	0.2232	61.	0.00956
1.6	0.1754	61.1	0.00319
1.7	0.1339	61.2	0.00638
1.8	0.0829	61.3	0.00638
1.9	0.06377	61.4	0.00638
2.	0.04783	61.5	0.00638
2.1	0.02232	61.6	0.00319
2.2	0.00956	61.7	0.00319
2.3	-0.01913	61.8	0.00956
2.4	-0.01913	61.9	0.00956
2.5	-0.02232	62.	0.01275
2.6	-0.01913	62.1	0.
2.7	-0.02232	62.2	0.00956
2.8	-0.02232	62.3	0.01275

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.01594	62.4	0.00319
3.	-0.02551	62.5	0.00956
3.1	-0.0287	62.6	-0.00319
3.2	-0.02232	62.7	0.01275
3.3	-0.00638	62.8	0.00638
3.4	-0.01594	62.9	0.00956
3.5	-0.02232	63.	0.00319
3.6	-0.00957	63.1	0.00638
3.7	-0.00319	63.2	0.00956
3.8	-0.01594	63.3	0.00638
3.9	-0.00957	63.4	0.00956
4.	-0.01276	63.5	0.00956
4.1	-0.01276	63.6	0.00319
4.2	-0.01594	63.7	0.00638
4.3	-0.00957	63.8	0.00319
4.4	0.	63.9	0.00319
4.5	-0.00319	64.	0.00638
4.6	-0.00957	64.1	0.00956
4.7	0.00319	64.2	0.01275
4.8	-0.01594	64.3	0.00319
4.9	-0.00638	64.4	0.00319
5.	-0.01276	64.5	0.01275
5.1	-0.01276	64.6	0.00956
5.2	-0.00957	64.7	0.
5.3	-0.01913	64.8	-0.00319
5.4	-0.01276	64.9	0.00638
5.5	-0.00319	65.	0.
5.6	-0.00957	65.1	0.00319
5.7	-0.00957	65.2	0.00638
5.8	-0.00638	65.3	0.00319
5.9	-0.00638	65.4	0.00956
6.	0.	65.5	0.00319
6.1	-0.00957	65.6	0.00638
6.2	-0.00638	65.7	0.00319
6.3	-0.00319	65.8	0.00319
6.4	-0.01913	65.9	0.00319
6.5	-0.00319	66.	0.00638
6.6	-0.00638	66.1	0.00638
6.7	-0.00638	66.2	0.01275
6.8	-0.00319	66.3	0.00956
6.9	-0.00638	66.4	0.00638
7.	-0.00319	66.5	-0.00319
7.1	0.	66.6	0.00956
7.2	-0.00638	66.7	0.
7.3	-0.0287	66.8	0.00319
7.4	-0.00638	66.9	0.00319
7.5	-0.00319	67.	-0.00319
7.6	-0.00957	67.1	-0.00638
7.7	-0.00957	67.2	0.
7.8	-0.01276	67.3	0.00319
7.9	-0.00638	67.4	0.00319
8.	-0.00319	67.5	0.00956
8.1	-0.00638	67.6	0.00956
8.2	-0.01276	67.7	0.00319
8.3	-0.00319	67.8	0.00956
8.4	-0.00957	67.9	0.00956
8.5	0.00319	68.	0.00638
8.6	-0.00638	68.1	0.00956
8.7	-0.00319	68.2	0.00956
8.8	-0.00638	68.3	0.01275
8.9	0.	68.4	0.00638
9.	-0.00957	68.5	0.00319
9.1	-0.00957	68.6	0.00638
9.2	-0.00957	68.7	0.00956
9.3	0.00319	68.8	0.00319
9.4	-0.00638	68.9	0.00956

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00957	69.	0.00638
9.6	-0.00638	69.1	0.00638
9.7	-0.00638	69.2	0.00638
9.8	-0.00319	69.3	0.00319
9.9	-0.00638	69.4	0.00956
10.	-0.00638	69.5	0.00956
10.1	0.00319	69.6	0.01275
10.2	0.00956	69.7	0.00638
10.3	-0.00319	69.8	0.00638
10.4	-0.00319	69.9	0.00956
10.5	0.	70.	0.01275
10.6	-0.00319	70.1	0.00638
10.7	0.00956	70.2	0.00319
10.8	0.	70.3	0.00638
10.9	0.	70.4	0.00638
11.	0.	70.5	0.00638
11.1	-0.00319	70.6	0.00319
11.2	0.	70.7	0.
11.3	-0.00319	70.8	0.00638
11.4	-0.00319	70.9	0.01913
11.5	-0.00319	71.	0.00956
11.6	-0.00319	71.1	0.00638
11.7	-0.00638	71.2	0.00956
11.8	0.	71.3	0.00638
11.9	-0.00319	71.4	-0.00638
12.	-0.00319	71.5	0.01275
12.1	-0.00319	71.6	0.00319
12.2	0.	71.7	0.
12.3	0.	71.8	0.00956
12.4	0.	71.9	0.00638
12.5	0.00319	72.	0.00638
12.6	-0.00638	72.1	0.00638
12.7	-0.00319	72.2	0.00638
12.8	-0.00957	72.3	0.00638
12.9	-0.00638	72.4	0.01594
13.	-0.00319	72.5	0.00956
13.1	-0.00957	72.6	0.01275
13.2	-0.00957	72.7	0.01275
13.3	-0.00319	72.8	0.01275
13.4	0.	72.9	0.01913
13.5	0.00638	73.	0.00638
13.6	-0.00638	73.1	0.00956
13.7	-0.00638	73.2	0.01275
13.8	0.	73.3	0.00956
13.9	0.00319	73.4	-0.00319
14.	-0.00638	73.5	0.00319
14.1	-0.01276	73.6	0.00638
14.2	-0.00638	73.7	0.00956
14.3	0.	73.8	0.00638
14.4	0.	73.9	0.01275
14.5	-0.00319	74.	0.00638
14.6	-0.01276	74.1	0.01275
14.7	0.00319	74.2	0.00638
14.8	0.	74.3	0.00319
14.9	0.	74.4	-0.00319
15.	0.00319	74.5	0.00956
15.1	0.00638	74.6	0.00956
15.2	0.	74.7	0.00956
15.3	-0.01276	74.8	0.00956
15.4	-0.00319	74.9	0.00638
15.5	-0.00319	75.	0.00638
15.6	-0.00638	75.1	0.00638
15.7	-0.00638	75.2	0.01275
15.8	0.00319	75.3	0.00956
15.9	0.00319	75.4	0.00956
16.	-0.00319	75.5	0.01275

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00638	75.6	0.01913
16.2	0.00319	75.7	0.00956
16.3	0.00638	75.8	0.00956
16.4	0.	75.9	0.02551
16.5	0.00638	76.	0.01275
16.6	-0.00319	76.1	0.00956
16.7	-0.00319	76.2	0.00638
16.8	-0.00638	76.3	0.01275
16.9	-0.00638	76.4	0.00956
17.	0.	76.5	0.00956
17.1	0.00956	76.6	0.
17.2	0.	76.7	0.01275
17.3	-0.00319	76.8	0.00319
17.4	0.00638	76.9	0.01275
17.5	-0.00638	77.	0.00319
17.6	0.	77.1	0.01275
17.7	-0.00319	77.2	0.00956
17.8	0.00319	77.3	0.00638
17.9	-0.00319	77.4	0.00956
18.	0.	77.5	0.00638
18.1	0.	77.6	0.00319
18.2	0.	77.7	0.01594
18.3	0.	77.8	0.00956
18.4	0.	77.9	0.01594
18.5	-0.00957	78.	0.00956
18.6	0.	78.1	0.00956
18.7	-0.00319	78.2	0.01275
18.8	0.	78.3	0.00956
18.9	0.	78.4	0.01275
19.	0.	78.5	0.00638
19.1	0.00638	78.6	0.00638
19.2	-0.00319	78.7	0.00638
19.3	0.	78.8	0.01275
19.4	-0.00319	78.9	0.01275
19.5	-0.00638	79.	0.00319
19.6	0.00638	79.1	0.00956
19.7	0.00319	79.2	0.01594
19.8	0.00319	79.3	0.00956
19.9	-0.00319	79.4	0.00319
20.	-0.00319	79.5	0.01275
20.1	-0.00319	79.6	0.00638
20.2	0.00638	79.7	0.
20.3	-0.00638	79.8	0.00638
20.4	0.	79.9	0.01275
20.5	0.00638	80.	0.00956
20.6	0.00638	80.1	0.00638
20.7	0.00638	80.2	0.00956
20.8	-0.00319	80.3	0.00638
20.9	-0.01276	80.4	0.00956
21.	0.00638	80.5	0.01594
21.1	0.	80.6	0.01275
21.2	0.	80.7	-0.00638
21.3	0.00956	80.8	0.
21.4	0.00638	80.9	0.00956
21.5	-0.00319	81.	0.01913
21.6	0.	81.1	0.00956
21.7	0.00319	81.2	0.01913
21.8	-0.00319	81.3	0.01594
21.9	-0.00319	81.4	0.00956
22.	0.	81.5	0.01275
22.1	-0.00319	81.6	0.01275
22.2	0.	81.7	0.01275
22.3	0.00319	81.8	0.01594
22.4	0.	81.9	0.00956
22.5	0.	82.	0.01594
22.6	-0.00319	82.1	0.01275

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	0.	82.2	0.01275
22.8	-0.00319	82.3	0.00638
22.9	0.	82.4	0.01913
23.	-0.00638	82.5	0.
23.1	-0.00319	82.6	0.01913
23.2	-0.00319	82.7	0.01594
23.3	0.00319	82.8	0.00638
23.4	0.00319	82.9	0.00638
23.5	0.00638	83.	0.01275
23.6	-0.00319	83.1	0.00956
23.7	0.00319	83.2	0.01275
23.8	0.00319	83.3	0.01275
23.9	0.00638	83.4	0.00956
24.	-0.00319	83.5	0.01275
24.1	-0.00319	83.6	0.01275
24.2	-0.00638	83.7	0.00956
24.3	0.00638	83.8	0.00638
24.4	0.00638	83.9	0.00319
24.5	0.00956	84.	0.00956
24.6	0.00319	84.1	-0.00319
24.7	0.00956	84.2	0.00638
24.8	0.	84.3	0.00319
24.9	-0.00638	84.4	0.00638
25.	0.	84.5	0.00956
25.1	0.	84.6	0.00638
25.2	-0.00319	84.7	0.01913
25.3	0.	84.8	0.01594
25.4	0.	84.9	0.01275
25.5	-0.00319	85.	0.00956
25.6	0.00319	85.1	0.00319
25.7	-0.00638	85.2	0.00956
25.8	0.00319	85.3	0.01275
25.9	-0.00638	85.4	0.00319
26.	-0.00319	85.5	0.00956
26.1	0.00319	85.6	0.00956
26.2	0.	85.7	0.00956
26.3	0.00956	85.8	0.00638
26.4	0.01594	85.9	0.00638
26.5	0.01594	86.	0.01275
26.6	0.00638	86.1	0.00956
26.7	0.	86.2	0.01275
26.8	0.	86.3	0.00638
26.9	0.00319	86.4	0.00319
27.	0.00319	86.5	0.01275
27.1	0.00319	86.6	0.01275
27.2	0.00956	86.7	0.01594
27.3	0.01275	86.8	0.01275
27.4	0.00319	86.9	0.01594
27.5	0.00319	87.	0.00956
27.6	0.00638	87.1	0.00638
27.7	0.	87.2	0.01275
27.8	-0.00319	87.3	0.01594
27.9	0.00638	87.4	0.00638
28.	-0.00319	87.5	0.01275
28.1	0.	87.6	0.01275
28.2	-0.00319	87.7	0.00956
28.3	0.	87.8	0.00638
28.4	0.00319	87.9	0.00956
28.5	0.	88.	0.00956
28.6	0.00638	88.1	0.01275
28.7	0.00956	88.2	0.01275
28.8	0.00319	88.3	0.00638
28.9	0.00956	88.4	0.01913
29.	0.	88.5	0.00956
29.1	0.	88.6	0.00956
29.2	0.00319	88.7	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	0.	88.8	0.01594
29.4	0.00319	88.9	0.01275
29.5	0.01275	89.	0.00956
29.6	0.00319	89.1	0.01275
29.7	0.	89.2	0.01275
29.8	0.00956	89.3	0.00956
29.9	0.00319	89.4	0.01594
30.	0.	89.5	0.00956
30.1	0.01275	89.6	0.01594
30.2	0.00638	89.7	0.01275
30.3	-0.00638	89.8	0.00956
30.4	0.01275	89.9	0.01275
30.5	0.00319	90.	0.00956
30.6	0.00319	90.1	0.01275
30.7	0.00638	90.2	0.01913
30.8	0.	90.3	0.01275
30.9	0.00956	90.4	0.01594
31.	0.	90.5	0.01594
31.1	0.	90.6	0.00956
31.2	-0.00319	90.7	0.00638
31.3	0.	90.8	0.01594
31.4	0.00319	90.9	0.01594
31.5	0.00319	91.	0.00956
31.6	0.00319	91.1	0.00638
31.7	0.00638	91.2	0.00319
31.8	-0.00319	91.3	0.01275
31.9	0.	91.4	0.00956
32.	0.00319	91.5	0.00638
32.1	0.00956	91.6	0.01275
32.2	0.00319	91.7	0.00638
32.3	0.00638	91.8	0.01275
32.4	0.	91.9	0.00956
32.5	0.00638	92.	0.00638
32.6	-0.00319	92.1	0.00319
32.7	0.00319	92.2	0.01594
32.8	0.00319	92.3	0.00956
32.9	0.00956	92.4	0.01594
33.	-0.00319	92.5	0.01275
33.1	0.00319	92.6	0.00956
33.2	0.00638	92.7	0.00638
33.3	-0.00319	92.8	0.01913
33.4	-0.00319	92.9	0.01594
33.5	0.	93.	0.01594
33.6	-0.00957	93.1	0.00319
33.7	0.	93.2	0.01275
33.8	0.00638	93.3	0.01275
33.9	0.00319	93.4	0.00638
34.	0.00319	93.5	0.00956
34.1	-0.00638	93.6	0.00319
34.2	0.	93.7	0.00956
34.3	-0.00319	93.8	0.00956
34.4	-0.00638	93.9	0.01594
34.5	0.00638	94.	0.01913
34.6	0.00638	94.1	0.01275
34.7	0.00956	94.2	0.00956
34.8	0.00638	94.3	0.01594
34.9	0.00638	94.4	0.01275
35.	0.	94.5	0.00956
35.1	0.00319	94.6	0.00638
35.2	0.00956	94.7	0.00956
35.3	0.00638	94.8	0.00956
35.4	0.	94.9	0.01275
35.5	0.00319	95.	0.00956
35.6	0.	95.1	0.01275
35.7	-0.00638	95.2	0.00638
35.8	0.	95.3	0.00956

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
35.9	-0.00319	95.4	0.01594
36.	0.	95.5	0.00956
36.1	0.00319	95.6	0.01594
36.2	0.00319	95.7	0.01594
36.3	-0.00319	95.8	0.00638
36.4	0.00638	95.9	0.01275
36.5	0.00319	96.	0.01594
36.6	0.00319	96.1	0.01594
36.7	0.	96.2	0.01275
36.8	0.00319	96.3	0.01594
36.9	0.00319	96.4	0.01275
37.	0.00319	96.5	0.01594
37.1	0.	96.6	0.00319
37.2	0.00638	96.7	0.01594
37.3	0.	96.8	0.01594
37.4	0.00638	96.9	0.01275
37.5	-0.00957	97.	0.00956
37.6	0.00638	97.1	0.00638
37.7	-0.00638	97.2	0.00319
37.8	0.00638	97.3	0.00638
37.9	-0.00319	97.4	0.00956
38.	0.	97.5	0.01594
38.1	0.00638	97.6	0.00956
38.2	0.00638	97.7	0.00638
38.3	0.	97.8	0.01275
38.4	0.00319	97.9	0.01275
38.5	0.00319	98.	0.00956
38.6	0.	98.1	0.00638
38.7	0.	98.2	0.00956
38.8	0.	98.3	0.00956
38.9	0.	98.4	0.00638
39.	0.00319	98.5	0.00956
39.1	0.00319	98.6	0.00638
39.2	0.	98.7	0.00956
39.3	0.00319	98.8	0.00956
39.4	0.00319	98.9	0.00319
39.5	0.	99.	0.01275
39.6	0.	99.1	0.00319
39.7	0.	99.2	0.00956
39.8	0.	99.3	0.00956
39.9	0.00956	99.4	0.00956
40.	0.00319	99.5	0.00956
40.1	0.00319	99.6	0.01913
40.2	-0.01276	99.7	0.01913
40.3	0.	99.8	0.01594
40.4	0.00638	99.9	0.00956
40.5	0.	100.	0.01913
40.6	0.00319	100.1	0.00956
40.7	0.00638	100.2	0.01594
40.8	0.	100.3	0.00319
40.9	-0.00319	100.4	0.00638
41.	0.00638	100.5	0.01594
41.1	0.00956	100.6	0.00956
41.2	0.00319	100.7	0.01594
41.3	0.00638	100.8	0.00319
41.4	0.	100.9	0.00956
41.5	-0.00319	101.	0.00638
41.6	0.00319	101.1	0.01275
41.7	0.	101.2	0.01594
41.8	0.00319	101.3	0.00638
41.9	-0.00319	101.4	0.00638
42.	0.00956	101.5	0.01275
42.1	-0.00319	101.6	0.00956
42.2	0.01594	101.7	0.01275
42.3	0.	101.8	0.00956
42.4	-0.00957	101.9	0.01913

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
42.5	0.00956	102.	0.00638
42.6	0.00638	102.1	0.00956
42.7	0.	102.2	0.01594
42.8	0.01594	102.3	0.01913
42.9	0.	102.4	0.00638
43.	0.00319	102.5	0.01275
43.1	0.00638	102.6	0.01594
43.2	0.00319	102.7	0.01275
43.3	0.00319	102.8	-0.00319
43.4	-0.00319	102.9	0.01913
43.5	0.	103.	0.00956
43.6	0.00638	103.1	0.00956
43.7	0.00638	103.2	0.01275
43.8	0.00956	103.3	0.00956
43.9	0.00638	103.4	0.01275
44.	0.01275	103.5	0.00319
44.1	0.00638	103.6	0.01275
44.2	0.00638	103.7	0.00638
44.3	0.00319	103.8	0.01594
44.4	0.00319	103.9	0.01275
44.5	0.00956	104.	0.01275
44.6	0.00638	104.1	0.00638
44.7	0.00956	104.2	0.01275
44.8	0.	104.3	0.01275
44.9	0.00319	104.4	0.00638
45.	0.00638	104.5	0.00638
45.1	0.00956	104.6	0.00956
45.2	0.01275	104.7	0.00956
45.3	0.00319	104.8	0.01275
45.4	0.00319	104.9	0.01275
45.5	0.00319	105.	0.00638
45.6	0.00638	105.1	0.01594
45.7	0.00956	105.2	0.02551
45.8	0.00638	105.3	0.00956
45.9	0.00638	105.4	0.00319
46.	-0.00638	105.5	0.00638
46.1	0.00319	105.6	0.01594
46.2	0.00638	105.7	0.00956
46.3	-0.00319	105.8	0.01275
46.4	0.00956	105.9	0.01594
46.5	0.00638	106.	0.01275
46.6	0.00319	106.1	0.00956
46.7	0.00638	106.2	0.01594
46.8	0.	106.3	0.00956
46.9	0.00319	106.4	0.00956
47.	0.01275	106.5	0.01275
47.1	0.	106.6	0.01275
47.2	0.00956	106.7	0.00319
47.3	0.00638	106.8	0.00956
47.4	0.00319	106.9	0.01913
47.5	0.00638	107.	0.01913
47.6	0.00319	107.1	0.00638
47.7	0.00956	107.2	0.01913
47.8	0.00319	107.3	0.00956
47.9	0.00956	107.4	0.01275
48.	0.00638	107.5	0.01275
48.1	0.00319	107.6	0.01594
48.2	0.00319	107.7	0.01913
48.3	0.00638	107.8	0.01594
48.4	0.	107.9	0.01594
48.5	0.	108.	0.01594
48.6	0.01275	108.1	0.01275
48.7	0.00319	108.2	0.01275
48.8	0.00638	108.3	0.00319
48.9	0.	108.4	0.00956
49.	0.00319	108.5	0.01913

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
49.1	0.00319	108.6	0.00319
49.2	0.00638	108.7	0.00956
49.3	0.00956	108.8	0.00638
49.4	0.00638	108.9	0.01594
49.5	0.00319	109.	0.00956
49.6	0.00956	109.1	0.01275
49.7	0.00319	109.2	0.00956
49.8	0.00319	109.3	0.01594
49.9	0.	109.4	0.01275
50.	0.	109.5	0.01275
50.1	0.	109.6	0.00956
50.2	0.00638	109.7	0.00956
50.3	0.00319	109.8	0.01913
50.4	0.00638	109.9	0.01594
50.5	0.00956	110.	0.00956
50.6	0.00956	110.1	0.00638
50.7	0.00638	110.2	0.00956
50.8	0.00956	110.3	0.00956
50.9	0.00319	110.4	0.01275
51.	0.01594	110.5	0.01594
51.1	0.00956	110.6	0.01913
51.2	0.00319	110.7	0.01275
51.3	0.	110.8	0.01275
51.4	0.00319	110.9	0.01275
51.5	0.00956	111.	0.01275
51.6	0.01275	111.1	0.01594
51.7	0.00638	111.2	0.01913
51.8	0.00638	111.3	0.01275
51.9	0.00956	111.4	0.01913
52.	0.00319	111.5	0.01913
52.1	0.00956	111.6	0.00956
52.2	0.00638	111.7	0.01275
52.3	0.00956	111.8	0.00956
52.4	0.00638	111.9	0.01594
52.5	0.00319	112.	0.00956
52.6	0.00956	112.1	0.00638
52.7	0.	112.2	0.00638
52.8	0.01275	112.3	0.00956
52.9	0.00319	112.4	0.00319
53.	0.	112.5	0.00956
53.1	0.00319	112.6	0.00956
53.2	0.00319	112.7	0.01275
53.3	0.01594	112.8	0.01594
53.4	0.00319	112.9	0.00956
53.5	-0.00319	113.	0.01594
53.6	0.00956	113.1	0.01594
53.7	0.	113.2	0.01913
53.8	-0.00319	113.3	0.01275
53.9	0.00638	113.4	0.01275
54.	0.00319	113.5	0.00638
54.1	0.00638	113.6	-0.00319
54.2	0.01275	113.7	0.00638
54.3	0.00638	113.8	0.01275
54.4	0.00319	113.9	0.01594
54.5	0.00956	114.	0.01594
54.6	0.00638	114.1	0.01594
54.7	0.00956	114.2	0.00956
54.8	0.01275	114.3	0.00638
54.9	0.00956	114.4	0.01594
55.	0.	114.5	0.01594
55.1	0.00319	114.6	0.00956
55.2	0.00319	114.7	0.02232
55.3	0.00956	114.8	0.01275
55.4	0.00638	114.9	0.00956
55.5	0.00319	115.	0.01594
55.6	0.00319	115.1	0.00956

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
55.7	0.00319	115.2	0.01594
55.8	0.	115.3	0.00956
55.9	0.	115.4	0.01594
56.	0.00638	115.5	0.01594
56.1	0.00956	115.6	0.00638
56.2	0.	115.7	0.01275
56.3	0.00638	115.8	0.01275
56.4	0.00956	115.9	0.00956
56.5	0.00956	116.	0.01594
56.6	0.00956	116.1	0.00956
56.7	0.00956	116.2	0.01594
56.8	0.00638	116.3	0.01594
56.9	0.00319	116.4	0.01594
57.	0.00319	116.5	0.01913
57.1	0.00638	116.6	0.01594
57.2	-0.00319	116.7	0.00956
57.3	-0.00319	116.8	0.01275
57.4	0.00319	116.9	0.00956
57.5	0.00319	117.	0.01275
57.6	0.02551	117.1	0.02551
57.7	0.00638	117.2	0.00956
57.8	0.00319	117.3	0.01594
57.9	0.00638	117.4	0.01913
58.	0.00956	117.5	0.02232
58.1	0.00319	117.6	0.01275
58.2	0.00319	117.7	0.01275
58.3	0.00638	117.8	0.01275
58.4	0.01594	117.9	0.01913
58.5	0.	118.	0.01594
58.6	0.	118.1	0.00638
58.7	0.00319	118.2	0.00638
58.8	0.00956	118.3	0.01594
58.9	0.00956	118.4	0.01275
59.	0.01275	118.5	0.01275
59.1	0.00638	118.6	0.00319
59.2	0.00956	118.7	0.01594
59.3	0.00956	118.8	0.01275
59.4	0.00638		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Hvorslev
Log Factor: 0.1887

VISUAL ESTIMATION RESULTS

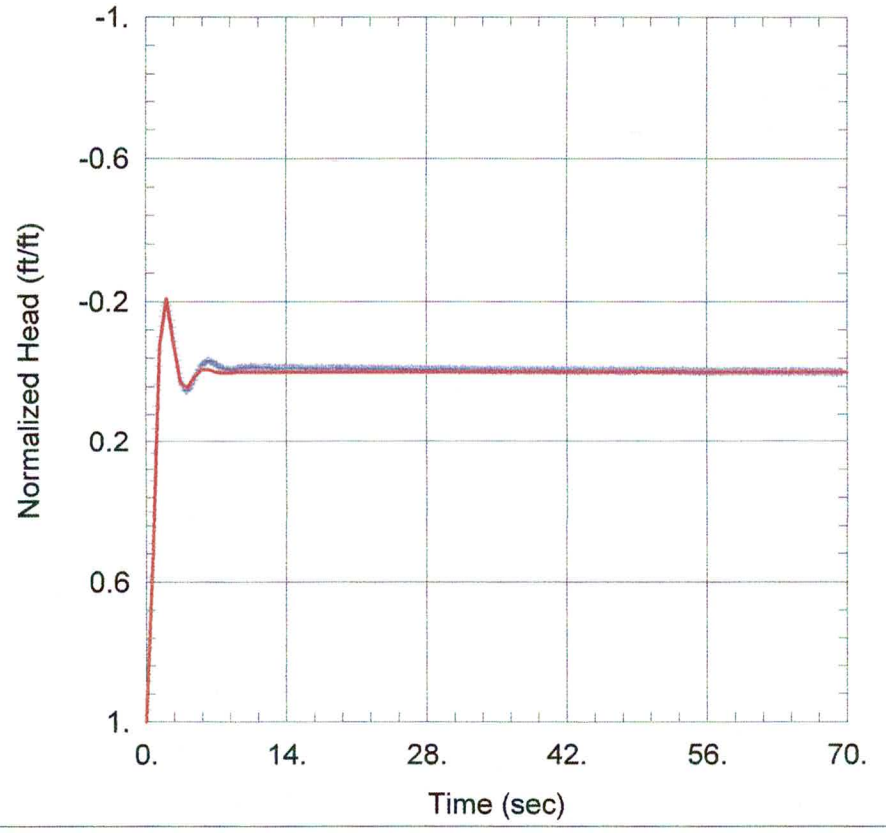
Estimated Parameters

Parameter	Estimate	
K	14.83	ft/day
y0	3.015	ft

K = 0.005233 cm/sec
T = K*b = 150.7 ft²/day (1.621 sq. cm/sec)

NOTES

Well Pressure = 54 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T74_Test4Springer-Gelhar.aqt
Date: 02/12/13 Time: 14:31:43

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T74
Test Date: 02/06/2013

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 164.2 ft/day
Le = 10.18 ft

AQUIFER DATA

Saturated Thickness: 22.75 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T74)

Initial Displacement: 2.17 ft
Total Well Penetration Depth: 22.56 ft
Casing Radius: 0.0833 ft

Static Water Column Height: 22.75 ft
Screen Length: 20. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:06:44

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/06/2013
Test Well: T74

AQUIFER DATA

Saturated Thickness: 22.75 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T74

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.17 ft
Static Water Column Height: 22.75 ft
Casing Radius: 0.0833 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3646 ft
Screen Length: 20. ft
Total Well Penetration Depth: 22.56 ft

No. of Observations: 697

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.175	34.9	-0.00957
0.1	2.095	35.	-0.00957
0.2	1.916	35.1	-0.01594
0.3	1.709	35.2	-0.00957
0.4	1.486	35.3	-0.01594
0.5	1.272	35.4	-0.01276
0.6	1.065	35.5	-0.00957
0.7	0.8673	35.6	-0.01276
0.8	0.676	35.7	-0.01276
0.9	0.507	35.8	-0.00957
1.	0.3476	35.9	-0.00957
1.1	0.2073	36.	-0.01276
1.2	0.07334	36.1	-0.00957
1.3	-0.03826	36.2	-0.00638
1.4	-0.1339	36.3	-0.00957
1.5	-0.2136	36.4	-0.00319
1.6	-0.287	36.5	-0.01276
1.7	-0.3444	36.6	-0.00638
1.8	-0.3795	36.7	-0.00957
1.9	-0.4113	36.8	-0.01276
2.	-0.4273	36.9	-0.00957
2.1	-0.4273	37.	-0.01276
2.2	-0.4177	37.1	-0.01276
2.3	-0.4082	37.2	-0.00638
2.4	-0.3795	37.3	-0.00957
2.5	-0.3508	37.4	-0.01276
2.6	-0.3189	37.5	-0.00957
2.7	-0.2774	37.6	-0.00957
2.8	-0.236	37.7	-0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.1881	37.8	-0.00957
3.	-0.1499	37.9	-0.00957
3.1	-0.1052	38.	-0.00957
3.2	-0.07334	38.1	-0.00957
3.3	-0.03189	38.2	-0.00957
3.4	0.00638	38.3	-0.00638
3.5	0.03189	38.4	-0.01276
3.6	0.0574	38.5	-0.00957
3.7	0.07653	38.6	-0.01276
3.8	0.08928	38.7	-0.01594
3.9	0.1052	38.8	-0.00638
4.	0.1116	38.9	-0.01276
4.1	0.1084	39.	-0.01276
4.2	0.1084	39.1	-0.00957
4.3	0.102	39.2	-0.01276
4.4	0.09566	39.3	-0.00957
4.5	0.09247	39.4	-0.00957
4.6	0.07653	39.5	-0.01594
4.7	0.06377	39.6	-0.00957
4.8	0.05102	39.7	-0.00638
4.9	0.04464	39.8	-0.01594
5.	0.02232	39.9	-0.00957
5.1	0.00957	40.	-0.00957
5.2	0.	40.1	-0.00957
5.3	-0.01594	40.2	-0.01594
5.4	-0.01913	40.3	-0.00957
5.5	-0.04145	40.4	-0.00957
5.6	-0.04464	40.5	-0.00957
5.7	-0.05102	40.6	-0.01276
5.8	-0.05421	40.7	-0.01594
5.9	-0.06059	40.8	-0.01276
6.	-0.06059	40.9	-0.00957
6.1	-0.06377	41.	-0.00638
6.2	-0.07015	41.1	-0.00957
6.3	-0.07334	41.2	-0.00638
6.4	-0.06696	41.3	-0.00957
6.5	-0.06377	41.4	-0.00319
6.6	-0.06377	41.5	-0.00638
6.7	-0.06059	41.6	-0.01276
6.8	-0.05421	41.7	-0.00957
6.9	-0.05421	41.8	-0.00957
7.	-0.04783	41.9	-0.00957
7.1	-0.04464	42.	-0.01276
7.2	-0.04464	42.1	-0.00957
7.3	-0.03508	42.2	-0.00957
7.4	-0.03508	42.3	-0.01276
7.5	-0.03189	42.4	-0.00638
7.6	-0.02551	42.5	-0.01276
7.7	-0.02551	42.6	-0.00957
7.8	-0.02551	42.7	-0.01276
7.9	-0.01913	42.8	-0.01276
8.	-0.01913	42.9	-0.00638
8.1	-0.02232	43.	-0.01276
8.2	-0.01594	43.1	-0.00638
8.3	-0.01594	43.2	-0.00957
8.4	-0.01594	43.3	-0.00638
8.5	-0.01276	43.4	-0.00957
8.6	-0.01594	43.5	-0.01594
8.7	-0.01276	43.6	-0.00957
8.8	-0.01913	43.7	-0.00957
8.9	-0.01913	43.8	-0.01913
9.	-0.01913	43.9	-0.00957
9.1	-0.02232	44.	-0.01276
9.2	-0.02551	44.1	-0.00319
9.3	-0.02551	44.2	-0.00957
9.4	-0.02551	44.3	-0.00957

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.02551	44.4	-0.00957
9.6	-0.0287	44.5	-0.00638
9.7	-0.03189	44.6	-0.00957
9.8	-0.02232	44.7	-0.00957
9.9	-0.03189	44.8	-0.01276
10.	-0.0287	44.9	-0.00957
10.1	-0.0287	45.	-0.00957
10.2	-0.0287	45.1	-0.00957
10.3	-0.0287	45.2	-0.00638
10.4	-0.02551	45.3	-0.00638
10.5	-0.03189	45.4	-0.01276
10.6	-0.03508	45.5	-0.00638
10.7	-0.0287	45.6	-0.00957
10.8	-0.0287	45.7	-0.01276
10.9	-0.03189	45.8	-0.01276
11.	-0.0287	45.9	-0.00638
11.1	-0.03189	46.	-0.00957
11.2	-0.0287	46.1	-0.00957
11.3	-0.02551	46.2	-0.00638
11.4	-0.02551	46.3	-0.01276
11.5	-0.0287	46.4	-0.01276
11.6	-0.02551	46.5	-0.01276
11.7	-0.02551	46.6	-0.01276
11.8	-0.0287	46.7	-0.00957
11.9	-0.03189	46.8	-0.01276
12.	-0.03189	46.9	-0.00638
12.1	-0.0287	47.	-0.00638
12.2	-0.02551	47.1	-0.00957
12.3	-0.03189	47.2	-0.00638
12.4	-0.03189	47.3	-0.00957
12.5	-0.02551	47.4	0.
12.6	-0.0287	47.5	-0.00957
12.7	-0.01594	47.6	-0.00319
12.8	-0.01913	47.7	-0.00957
12.9	-0.0287	47.8	-0.00957
13.	-0.0287	47.9	-0.00319
13.1	-0.02551	48.	-0.00957
13.2	-0.02232	48.1	-0.00957
13.3	-0.02232	48.2	-0.00319
13.4	-0.02551	48.3	-0.00957
13.5	-0.02551	48.4	-0.00638
13.6	-0.02551	48.5	-0.00957
13.7	-0.02551	48.6	-0.00957
13.8	-0.02551	48.7	-0.01276
13.9	-0.0287	48.8	-0.00638
14.	-0.02232	48.9	-0.00638
14.1	-0.02551	49.	-0.00957
14.2	-0.0287	49.1	-0.00957
14.3	-0.02232	49.2	-0.00957
14.4	-0.0287	49.3	-0.00957
14.5	-0.02551	49.4	-0.00957
14.6	-0.0287	49.5	-0.01276
14.7	-0.02551	49.6	-0.01276
14.8	-0.02551	49.7	-0.00957
14.9	-0.0287	49.8	-0.00957
15.	-0.0287	49.9	-0.01276
15.1	-0.02232	50.	-0.00957
15.2	-0.02551	50.1	-0.00638
15.3	-0.02232	50.2	-0.01276
15.4	-0.02551	50.3	-0.00638
15.5	-0.0287	50.4	-0.00957
15.6	-0.0287	50.5	-0.01276
15.7	-0.02551	50.6	-0.00957
15.8	-0.02551	50.7	-0.00957
15.9	-0.01913	50.8	-0.00638
16.	-0.02232	50.9	-0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.02232	51.	-0.00957
16.2	-0.02232	51.1	-0.00957
16.3	-0.01913	51.2	-0.00957
16.4	-0.02232	51.3	-0.00638
16.5	-0.02232	51.4	-0.00638
16.6	-0.02551	51.5	-0.00957
16.7	-0.02551	51.6	-0.00638
16.8	-0.01594	51.7	-0.00638
16.9	-0.02232	51.8	-0.00638
17.	-0.0287	51.9	-0.01276
17.1	-0.02551	52.	-0.00957
17.2	-0.02551	52.1	-0.00638
17.3	-0.02232	52.2	-0.00638
17.4	-0.01913	52.3	-0.00638
17.5	-0.02551	52.4	-0.00957
17.6	-0.02551	52.5	-0.00957
17.7	-0.02551	52.6	-0.00638
17.8	-0.01913	52.7	-0.00957
17.9	-0.01913	52.8	-0.01276
18.	-0.02232	52.9	-0.00957
18.1	-0.01913	53.	-0.00957
18.2	-0.02232	53.1	-0.00638
18.3	-0.02551	53.2	-0.01276
18.4	-0.02232	53.3	-0.00638
18.5	-0.02551	53.4	-0.00957
18.6	-0.02551	53.5	-0.00638
18.7	-0.02232	53.6	-0.00957
18.8	-0.02551	53.7	-0.01276
18.9	-0.02551	53.8	-0.00638
19.	-0.02232	53.9	-0.00638
19.1	-0.0287	54.	-0.00957
19.2	-0.02232	54.1	-0.00638
19.3	-0.01913	54.2	-0.00638
19.4	-0.02551	54.3	-0.00319
19.5	-0.01913	54.4	-0.00638
19.6	-0.02232	54.5	-0.00319
19.7	-0.01913	54.6	-0.00319
19.8	-0.02232	54.7	-0.00638
19.9	-0.02551	54.8	-0.00638
20.	-0.02232	54.9	0.
20.1	-0.02232	55.	-0.00638
20.2	-0.02551	55.1	-0.00957
20.3	-0.02551	55.2	-0.00319
20.4	-0.02551	55.3	0.
20.5	-0.01594	55.4	-0.00638
20.6	-0.01913	55.5	-0.00638
20.7	-0.01913	55.6	-0.00638
20.8	-0.02232	55.7	-0.00638
20.9	-0.01913	55.8	-0.00638
21.	-0.02232	55.9	-0.00319
21.1	-0.01913	56.	-0.00638
21.2	-0.01913	56.1	-0.00319
21.3	-0.01594	56.2	-0.00638
21.4	-0.02232	56.3	0.
21.5	-0.02232	56.4	-0.00638
21.6	-0.02232	56.5	-0.00319
21.7	-0.02232	56.6	-0.00638
21.8	-0.01594	56.7	0.
21.9	-0.01913	56.8	-0.00638
22.	-0.01913	56.9	-0.00638
22.1	-0.01913	57.	-0.00319
22.2	-0.01913	57.1	-0.00957
22.3	-0.02551	57.2	-0.00638
22.4	-0.01594	57.3	-0.00957
22.5	-0.02232	57.4	0.
22.6	-0.02232	57.5	-0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.01594	57.6	-0.00319
22.8	-0.02232	57.7	-0.00319
22.9	-0.02232	57.8	-0.00638
23.	-0.01594	57.9	-0.00319
23.1	-0.01913	58.	-0.00957
23.2	-0.02551	58.1	-0.00638
23.3	-0.01913	58.2	-0.00319
23.4	-0.01594	58.3	-0.00319
23.5	-0.01913	58.4	-0.00957
23.6	-0.01913	58.5	-0.00319
23.7	-0.02551	58.6	-0.00319
23.8	-0.01594	58.7	-0.00957
23.9	-0.01594	58.8	-0.00638
24.	-0.01594	58.9	-0.00957
24.1	-0.01594	59.	-0.00638
24.2	-0.01913	59.1	-0.00638
24.3	-0.01913	59.2	-0.00638
24.4	-0.01913	59.3	-0.00319
24.5	-0.01594	59.4	-0.00319
24.6	-0.01913	59.5	-0.00319
24.7	-0.01913	59.6	-0.00638
24.8	-0.02232	59.7	-0.00957
24.9	-0.01594	59.8	-0.00319
25.	-0.02232	59.9	-0.00638
25.1	-0.01594	60.	-0.00638
25.2	-0.01913	60.1	-0.00319
25.3	-0.01594	60.2	-0.00319
25.4	-0.02232	60.3	-0.00957
25.5	-0.01913	60.4	-0.00319
25.6	-0.01276	60.5	-0.00638
25.7	-0.00957	60.6	-0.00319
25.8	-0.01913	60.7	-0.00319
25.9	-0.01594	60.8	-0.00638
26.	-0.01594	60.9	-0.00957
26.1	-0.01913	61.	-0.00319
26.2	-0.01913	61.1	-0.00638
26.3	-0.01913	61.2	-0.00319
26.4	-0.01276	61.3	-0.00638
26.5	-0.02232	61.4	-0.00319
26.6	-0.01913	61.5	-0.00638
26.7	-0.01276	61.6	-0.00319
26.8	-0.01594	61.7	-0.00319
26.9	-0.01913	61.8	-0.00319
27.	-0.01594	61.9	0.
27.1	-0.01594	62.	-0.00319
27.2	-0.01913	62.1	-0.00638
27.3	-0.01594	62.2	-0.00319
27.4	-0.01913	62.3	-0.00319
27.5	-0.01913	62.4	-0.00638
27.6	-0.01276	62.5	-0.00319
27.7	-0.01594	62.6	-0.00638
27.8	-0.01594	62.7	-0.00319
27.9	-0.01594	62.8	-0.00319
28.	-0.01594	62.9	-0.00638
28.1	-0.01913	63.	0.
28.2	-0.01276	63.1	-0.00319
28.3	-0.01594	63.2	-0.00638
28.4	-0.01913	63.3	-0.00638
28.5	-0.01276	63.4	0.
28.6	-0.01594	63.5	0.
28.7	-0.01276	63.6	0.
28.8	-0.01594	63.7	-0.00638
28.9	-0.01913	63.8	-0.00319
29.	-0.01594	63.9	-0.00638
29.1	-0.00957	64.	-0.00638
29.2	-0.01594	64.1	-0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	-0.01594	64.2	0.00319
29.4	-0.02232	64.3	0.
29.5	-0.01913	64.4	-0.00319
29.6	-0.01594	64.5	-0.00319
29.7	-0.01594	64.6	-0.00957
29.8	-0.01594	64.7	-0.00319
29.9	-0.01594	64.8	-0.00319
30.	-0.01594	64.9	-0.00319
30.1	-0.01594	65.	-0.00319
30.2	-0.01594	65.1	-0.00319
30.3	-0.01913	65.2	-0.00319
30.4	-0.02232	65.3	-0.00638
30.5	-0.00957	65.4	-0.00319
30.6	-0.01276	65.5	-0.00638
30.7	-0.01913	65.6	0.
30.8	-0.01594	65.7	-0.00957
30.9	-0.01276	65.8	-0.00319
31.	-0.01594	65.9	-0.00319
31.1	-0.01594	66.	0.
31.2	-0.01276	66.1	-0.00638
31.3	-0.00957	66.2	0.
31.4	-0.00957	66.3	-0.00319
31.5	-0.01594	66.4	-0.00319
31.6	-0.01276	66.5	0.
31.7	-0.02232	66.6	-0.00638
31.8	-0.01276	66.7	-0.00319
31.9	-0.01913	66.8	0.
32.	-0.01276	66.9	-0.00319
32.1	-0.00957	67.	-0.00319
32.2	-0.01594	67.1	-0.00638
32.3	-0.00957	67.2	0.
32.4	-0.01276	67.3	-0.00319
32.5	-0.01594	67.4	0.
32.6	-0.01276	67.5	-0.00319
32.7	-0.01276	67.6	-0.00638
32.8	-0.01276	67.7	-0.00638
32.9	-0.01594	67.8	0.
33.	-0.01594	67.9	0.
33.1	-0.01276	68.	0.
33.2	-0.01276	68.1	-0.00638
33.3	-0.01594	68.2	-0.00319
33.4	-0.01276	68.3	0.
33.5	-0.00957	68.4	-0.00319
33.6	-0.01276	68.5	0.
33.7	-0.01276	68.6	0.
33.8	-0.00957	68.7	0.
33.9	-0.00957	68.8	0.00319
34.	-0.01276	68.9	-0.00319
34.1	-0.01913	69.	0.00319
34.2	-0.01594	69.1	0.00319
34.3	-0.01913	69.2	-0.00319
34.4	-0.01276	69.3	-0.00319
34.5	-0.01276	69.4	-0.00319
34.6	-0.00957	69.5	0.
34.7	-0.00957	69.6	0.
34.8	-0.01276		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 5.519

VISUAL ESTIMATION RESULTS

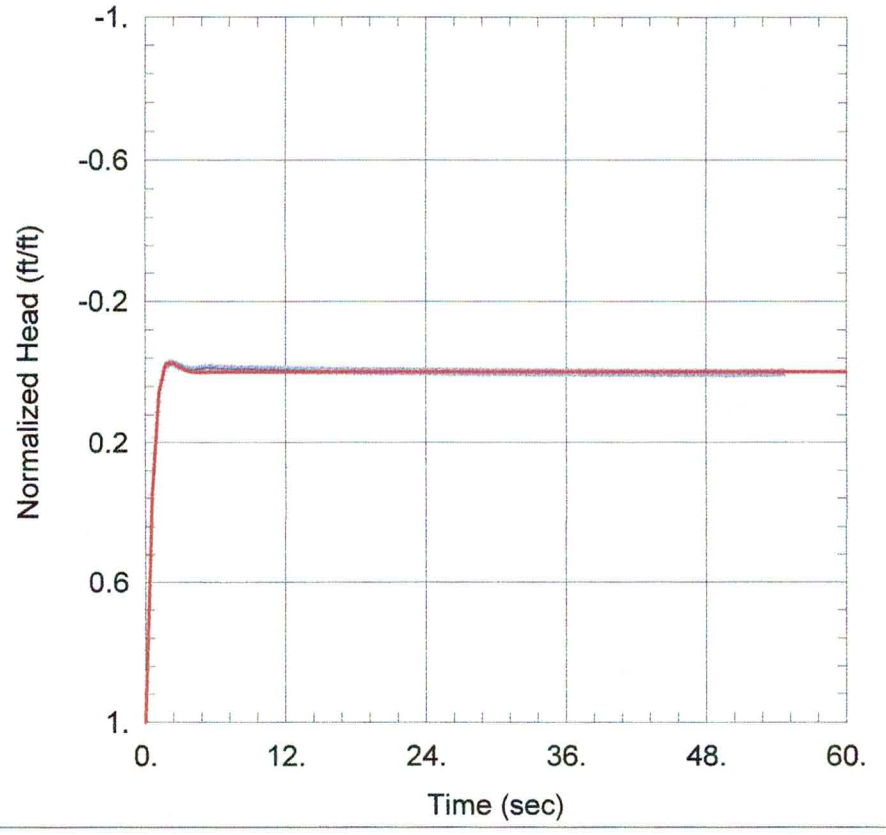
Estimated Parameters

Parameter	Estimate	
K	164.2	ft/day
Le	10.18	ft

K = 0.05793 cm/sec
T = K*b = 3735.8 ft²/day (40.17 sq. cm/sec)
Le = 10.18 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 32 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T81_Test1Springer-Gelhar.aqt
Date: 02/12/13 Time: 14:33:59

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T81
Test Date: 02/06/13

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 552.8 ft/day
Le = 0.0659 ft

AQUIFER DATA

Saturated Thickness: 19.8 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T81)

Initial Displacement: 3.32 ft
Total Well Penetration Depth: 25.65 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 19.8 ft
Screen Length: 20. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:07:50

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/06/13
Test Well: T81

AQUIFER DATA

Saturated Thickness: 19.8 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T81

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 3.32 ft
Static Water Column Height: 19.8 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 20. ft
Total Well Penetration Depth: 25.65 ft

No. of Observations: 549

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	3.319	27.5	0.
0.1	2.934	27.6	0.
0.2	2.806	27.7	-0.00318
0.3	2.117	27.8	-0.00318
0.4	1.738	27.9	0.
0.5	1.425	28.	-0.00318
0.6	1.158	28.1	0.
0.7	0.947	28.2	0.00319
0.8	0.7653	28.3	-0.00637
0.9	0.6122	28.4	0.
1.	0.4879	28.5	0.00638
1.1	0.3731	28.6	0.00319
1.2	0.2774	28.7	-0.00637
1.3	0.1977	28.8	0.00319
1.4	0.1371	28.9	0.00319
1.5	0.07334	29.	0.00319
1.6	0.02232	29.1	0.
1.7	-0.01275	29.2	-0.00318
1.8	-0.04464	29.3	0.00957
1.9	-0.06058	29.4	0.00319
2.	-0.07015	29.5	0.00319
2.1	-0.08609	29.6	0.00638
2.2	-0.0829	29.7	-0.00318
2.3	-0.08928	29.8	0.
2.4	-0.0829	29.9	0.00319
2.5	-0.07971	30.	0.00319
2.6	-0.07334	30.1	0.
2.7	-0.07652	30.2	-0.00318
2.8	-0.06377	30.3	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.05739	30.4	0.00319
3.	-0.06058	30.5	0.
3.1	-0.04783	30.6	0.
3.2	-0.04783	30.7	0.
3.3	-0.04145	30.8	0.
3.4	-0.03507	30.9	0.
3.5	-0.03188	31.	0.
3.6	-0.03188	31.1	0.00319
3.7	-0.03188	31.2	0.00319
3.8	-0.02551	31.3	0.
3.9	-0.02232	31.4	0.00319
4.	-0.01913	31.5	0.
4.1	-0.02232	31.6	0.00319
4.2	-0.02551	31.7	0.
4.3	-0.02551	31.8	0.00319
4.4	-0.02551	31.9	0.00319
4.5	-0.02551	32.	0.00319
4.6	-0.03188	32.1	0.
4.7	-0.02869	32.2	0.
4.8	-0.03826	32.3	0.
4.9	-0.03507	32.4	0.00319
5.	-0.03826	32.5	0.
5.1	-0.03826	32.6	0.00319
5.2	-0.04464	32.7	0.00638
5.3	-0.04145	32.8	0.00319
5.4	-0.03826	32.9	0.
5.5	-0.04145	33.	0.00638
5.6	-0.04145	33.1	0.00319
5.7	-0.04783	33.2	0.00319
5.8	-0.04464	33.3	0.00319
5.9	-0.04464	33.4	0.
6.	-0.03507	33.5	0.
6.1	-0.03826	33.6	0.00319
6.2	-0.03507	33.7	0.00319
6.3	-0.03826	33.8	0.00319
6.4	-0.03507	33.9	0.00319
6.5	-0.03826	34.	0.00319
6.6	-0.03188	34.1	0.00319
6.7	-0.03507	34.2	0.00319
6.8	-0.03507	34.3	0.00319
6.9	-0.03507	34.4	0.00319
7.	-0.03507	34.5	0.
7.1	-0.03507	34.6	0.00319
7.2	-0.03188	34.7	0.
7.3	-0.02869	34.8	0.
7.4	-0.03188	34.9	0.00638
7.5	-0.03188	35.	0.00319
7.6	-0.02869	35.1	0.
7.7	-0.03188	35.2	0.00638
7.8	-0.03507	35.3	0.00319
7.9	-0.02869	35.4	0.00638
8.	-0.03188	35.5	0.00638
8.1	-0.02551	35.6	0.00638
8.2	-0.03188	35.7	0.01276
8.3	-0.03188	35.8	0.
8.4	-0.02869	35.9	0.00638
8.5	-0.02551	36.	0.00319
8.6	-0.03188	36.1	-0.00318
8.7	-0.02869	36.2	0.
8.8	-0.02551	36.3	0.
8.9	-0.02551	36.4	0.00638
9.	-0.03188	36.5	0.
9.1	-0.03188	36.6	0.00957
9.2	-0.03507	36.7	0.00638
9.3	-0.03188	36.8	0.00638
9.4	-0.02869	36.9	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.02551	37.	0.
9.6	-0.02551	37.1	0.
9.7	-0.02869	37.2	0.00319
9.8	-0.02232	37.3	0.00319
9.9	-0.02551	37.4	0.00638
10.	-0.02551	37.5	0.00319
10.1	-0.02232	37.6	0.00638
10.2	-0.01913	37.7	0.00957
10.3	-0.02551	37.8	0.00957
10.4	-0.02551	37.9	0.00319
10.5	-0.02551	38.	0.00319
10.6	-0.02869	38.1	0.00638
10.7	-0.02551	38.2	0.00319
10.8	-0.02869	38.3	0.00638
10.9	-0.02869	38.4	0.00319
11.	-0.01913	38.5	0.00638
11.1	-0.02232	38.6	0.
11.2	-0.02869	38.7	0.00638
11.3	-0.01913	38.8	0.00319
11.4	-0.02232	38.9	0.00319
11.5	-0.01913	39.	0.00319
11.6	-0.02551	39.1	0.00319
11.7	-0.02232	39.2	0.00319
11.8	-0.01913	39.3	0.00319
11.9	-0.01913	39.4	0.00957
12.	-0.02551	39.5	0.00638
12.1	-0.01913	39.6	0.
12.2	-0.01913	39.7	0.01276
12.3	-0.02232	39.8	0.00957
12.4	-0.01913	39.9	0.00638
12.5	-0.02232	40.	0.00319
12.6	-0.02232	40.1	0.00957
12.7	-0.01913	40.2	0.00638
12.8	-0.01594	40.3	0.00638
12.9	-0.01594	40.4	0.00638
13.	-0.01594	40.5	0.00319
13.1	-0.02232	40.6	0.00957
13.2	-0.02232	40.7	0.00638
13.3	-0.01913	40.8	0.00957
13.4	-0.02232	40.9	0.00957
13.5	-0.01594	41.	0.00638
13.6	-0.01594	41.1	0.00638
13.7	-0.01913	41.2	0.00638
13.8	-0.01275	41.3	0.00319
13.9	-0.01913	41.4	0.00319
14.	-0.01594	41.5	0.00957
14.1	-0.01913	41.6	0.00638
14.2	-0.01594	41.7	0.00957
14.3	-0.01594	41.8	0.00957
14.4	-0.01594	41.9	0.00319
14.5	-0.01594	42.	0.00638
14.6	-0.01913	42.1	0.00638
14.7	-0.01275	42.2	0.00638
14.8	-0.01594	42.3	0.00957
14.9	-0.00956	42.4	0.00957
15.	-0.01275	42.5	0.00638
15.1	-0.01594	42.6	0.00638
15.2	-0.01594	42.7	0.00957
15.3	-0.01594	42.8	0.00638
15.4	-0.01275	42.9	0.00319
15.5	-0.00956	43.	0.00957
15.6	-0.01594	43.1	0.00957
15.7	-0.01275	43.2	0.00319
15.8	-0.01275	43.3	0.00957
15.9	-0.01275	43.4	0.00638
16.	-0.00956	43.5	0.00957

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.01275	43.6	0.01276
16.2	-0.01275	43.7	0.01595
16.3	-0.01594	43.8	0.00638
16.4	-0.00956	43.9	0.00957
16.5	-0.01275	44.	0.00319
16.6	-0.01594	44.1	0.00638
16.7	-0.00956	44.2	0.00957
16.8	-0.01275	44.3	0.00957
16.9	-0.01275	44.4	0.
17.	-0.01594	44.5	0.00638
17.1	-0.01275	44.6	0.00638
17.2	-0.01275	44.7	0.00638
17.3	-0.00956	44.8	0.01276
17.4	-0.01275	44.9	0.00638
17.5	-0.00956	45.	0.01276
17.6	-0.01913	45.1	0.00957
17.7	-0.00637	45.2	0.00957
17.8	-0.01275	45.3	0.00638
17.9	-0.00637	45.4	0.00638
18.	-0.00637	45.5	0.00957
18.1	-0.01275	45.6	0.00957
18.2	-0.00637	45.7	0.00957
18.3	-0.00637	45.8	0.00319
18.4	-0.00637	45.9	0.00638
18.5	-0.00956	46.	0.00638
18.6	-0.00956	46.1	0.00638
18.7	-0.00956	46.2	0.01276
18.8	-0.00956	46.3	0.01276
18.9	-0.00956	46.4	0.00638
19.	-0.00956	46.5	0.01276
19.1	-0.00956	46.6	0.01276
19.2	-0.00956	46.7	0.00957
19.3	-0.00637	46.8	0.00957
19.4	-0.00318	46.9	0.00957
19.5	-0.00956	47.	0.00957
19.6	-0.01275	47.1	0.00957
19.7	-0.00637	47.2	0.00319
19.8	-0.00956	47.3	0.00638
19.9	-0.01594	47.4	0.00638
20.	-0.00637	47.5	0.00957
20.1	-0.00956	47.6	0.01276
20.2	-0.00637	47.7	0.01276
20.3	-0.00637	47.8	0.00638
20.4	-0.00637	47.9	0.00638
20.5	-0.00318	48.	0.01276
20.6	-0.00637	48.1	0.00638
20.7	-0.00637	48.2	0.00638
20.8	-0.00637	48.3	0.00638
20.9	-0.00637	48.4	0.00957
21.	-0.00956	48.5	0.00957
21.1	-0.00318	48.6	0.01276
21.2	-0.00637	48.7	0.00957
21.3	-0.00956	48.8	0.00957
21.4	-0.00956	48.9	0.00319
21.5	-0.00318	49.	0.00638
21.6	-0.00956	49.1	0.01276
21.7	-0.00956	49.2	0.00957
21.8	-0.00637	49.3	0.00638
21.9	-0.00956	49.4	0.00957
22.	-0.00956	49.5	0.00957
22.1	-0.00637	49.6	0.01276
22.2	-0.00637	49.7	0.01276
22.3	-0.00318	49.8	0.00957
22.4	-0.00318	49.9	0.00638
22.5	-0.00637	50.	0.01276
22.6	-0.00637	50.1	0.00957

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.00637	50.2	0.00638
22.8	-0.00318	50.3	0.00957
22.9	-0.00318	50.4	0.00957
23.	-0.00318	50.5	0.01276
23.1	-0.00637	50.6	0.00957
23.2	-0.00318	50.7	0.01276
23.3	-0.00637	50.8	0.01276
23.4	-0.00318	50.9	0.01276
23.5	-0.00318	51.	0.00638
23.6	-0.00318	51.1	0.00957
23.7	-0.00637	51.2	0.00319
23.8	0.	51.3	0.00638
23.9	-0.00318	51.4	0.00319
24.	-0.00318	51.5	0.00957
24.1	-0.00318	51.6	0.00638
24.2	-0.00318	51.7	0.01595
24.3	-0.00318	51.8	0.00638
24.4	0.	51.9	0.00957
24.5	-0.00318	52.	0.00319
24.6	-0.00637	52.1	0.00957
24.7	0.	52.2	0.01276
24.8	-0.00318	52.3	0.00638
24.9	-0.00318	52.4	0.00638
25.	0.	52.5	0.00638
25.1	-0.00637	52.6	0.00638
25.2	-0.00637	52.7	0.00957
25.3	-0.00318	52.8	0.00957
25.4	0.	52.9	0.00957
25.5	-0.00318	53.	0.00957
25.6	0.	53.1	0.00957
25.7	0.	53.2	0.00957
25.8	-0.00318	53.3	0.01276
25.9	-0.00318	53.4	0.00638
26.	0.00319	53.5	0.00957
26.1	-0.00318	53.6	0.00957
26.2	0.00319	53.7	0.00638
26.3	-0.00318	53.8	0.00638
26.4	0.	53.9	0.01595
26.5	0.	54.	0.00638
26.6	-0.00318	54.1	0.01276
26.7	-0.00637	54.2	0.00638
26.8	0.	54.3	0.00957
26.9	0.	54.4	0.00957
27.	-0.00318	54.5	0.
27.1	0.	54.6	0.00638
27.2	-0.00318	54.7	0.
27.3	-0.00318	54.8	0.00638
27.4	0.00319		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.463

VISUAL ESTIMATION RESULTS

Estimated Parameters

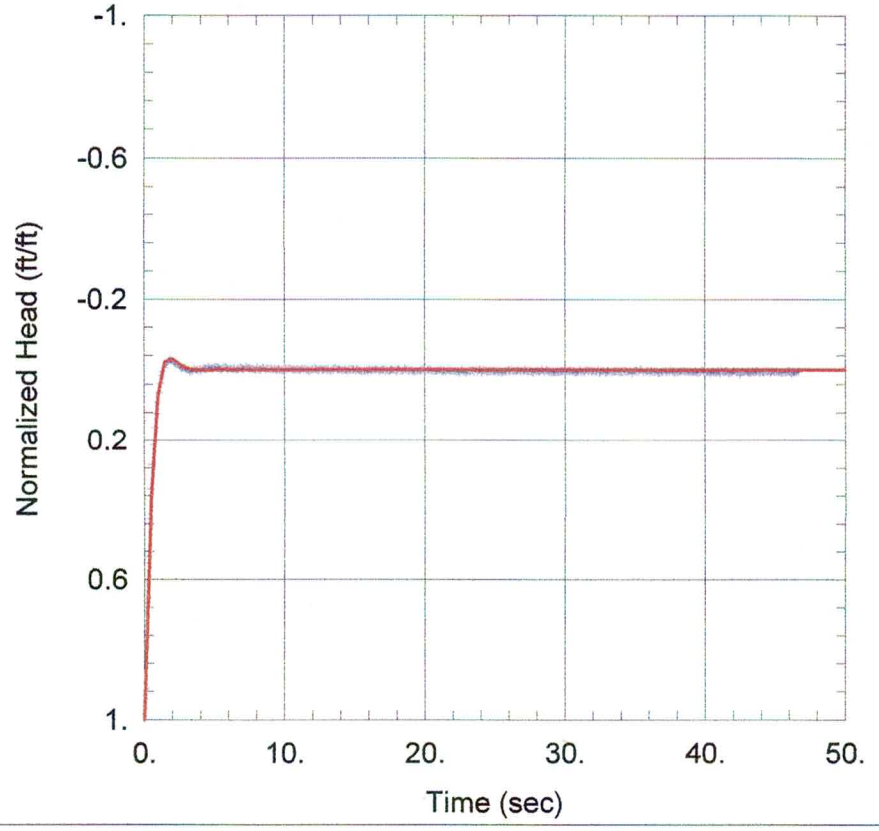
Parameter	Estimate	
K	552.8	ft/day
Le	0.0659	ft

K = 0.195 cm/sec
T = K*b = 1.095E+4 ft²/day (117.7 sq. cm/sec)

Le = 0.0659 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 58 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T82_Test2Springer-Gelhar.aqt
Date: 02/12/13 Time: 14:34:58

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T82
Test Date: 02/07/2013

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 689.8 ft/day
Le = 0.04597 ft

AQUIFER DATA

Saturated Thickness: 19.83 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T82)

Initial Displacement: 2.69 ft
Total Well Penetration Depth: 24.28 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 19.83 ft
Screen Length: 20. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:08:45

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/2013
Test Well: T82

AQUIFER DATA

Saturated Thickness: 19.83 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T82

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.69 ft
Static Water Column Height: 19.83 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 20. ft
Total Well Penetration Depth: 24.28 ft

No. of Observations: 468

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.694	23.4	0.00956
0.1	2.452	23.5	0.00637
0.2	1.789	23.6	0.00637
0.3	1.435	23.7	0.00319
0.4	1.145	23.8	0.01275
0.5	0.9152	23.9	0.00319
0.6	0.727	24.	0.00319
0.7	0.574	24.1	0.01913
0.8	0.44	24.2	0.
0.9	0.3316	24.3	0.01275
1.	0.2423	24.4	0.00637
1.1	0.1658	24.5	0.01275
1.2	0.09885	24.6	0.00956
1.3	0.04464	24.7	0.00956
1.4	0.01275	24.8	0.00637
1.5	-0.01595	24.9	0.00956
1.6	-0.04464	25.	0.01275
1.7	-0.0574	25.1	0.00956
1.8	-0.07015	25.2	0.01275
1.9	-0.07653	25.3	0.01913
2.	-0.06697	25.4	0.00637
2.1	-0.06059	25.5	0.01913
2.2	-0.04783	25.6	0.01594
2.3	-0.04783	25.7	0.00956
2.4	-0.04146	25.8	0.01275
2.5	-0.03827	25.9	0.00956
2.6	-0.02232	26.	0.00319
2.7	-0.01276	26.1	0.00637
2.8	-0.01595	26.2	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.01276	26.3	0.00637
3.	-0.00638	26.4	0.00637
3.1	0.	26.5	0.00956
3.2	0.00319	26.6	0.00956
3.3	0.01275	26.7	0.00319
3.4	0.00319	26.8	0.00319
3.5	0.00956	26.9	0.00956
3.6	-0.00957	27.	0.01275
3.7	0.	27.1	0.01275
3.8	0.00319	27.2	0.
3.9	0.	27.3	0.00956
4.	-0.00319	27.4	0.00956
4.1	0.00319	27.5	0.00637
4.2	-0.01276	27.6	0.00956
4.3	-0.00957	27.7	0.01275
4.4	-0.01276	27.8	0.01594
4.5	-0.00638	27.9	0.00956
4.6	-0.02551	28.	0.01275
4.7	-0.01276	28.1	0.00637
4.8	-0.01914	28.2	0.01594
4.9	-0.00957	28.3	0.00956
5.	-0.01914	28.4	-0.00319
5.1	-0.01914	28.5	0.00637
5.2	-0.02232	28.6	0.01275
5.3	-0.01595	28.7	0.
5.4	-0.01276	28.8	0.00956
5.5	-0.00319	28.9	0.01275
5.6	-0.01276	29.	0.01275
5.7	-0.01595	29.1	0.01913
5.8	-0.01595	29.2	0.01275
5.9	-0.01595	29.3	0.01913
6.	-0.00638	29.4	0.01594
6.1	-0.00957	29.5	0.00637
6.2	-0.00957	29.6	0.01594
6.3	-0.00957	29.7	0.00956
6.4	-0.00638	29.8	0.00956
6.5	-0.01276	29.9	0.00956
6.6	0.	30.	0.01275
6.7	-0.00638	30.1	0.01594
6.8	-0.00957	30.2	0.00956
6.9	-0.01595	30.3	0.00637
7.	-0.01276	30.4	0.00637
7.1	-0.00638	30.5	0.00956
7.2	-0.00957	30.6	0.00956
7.3	-0.02551	30.7	0.01275
7.4	-0.01276	30.8	0.01913
7.5	-0.01276	30.9	0.01594
7.6	-0.01276	31.	0.01275
7.7	-0.00638	31.1	0.
7.8	-0.00638	31.2	0.01594
7.9	-0.00319	31.3	0.00956
8.	-0.00319	31.4	0.01594
8.1	-0.01914	31.5	0.00637
8.2	-0.00319	31.6	0.00319
8.3	-0.00319	31.7	0.00637
8.4	-0.00638	31.8	0.00319
8.5	-0.01595	31.9	0.01275
8.6	-0.00957	32.	0.00637
8.7	-0.00638	32.1	0.01275
8.8	-0.00638	32.2	0.00956
8.9	-0.00957	32.3	0.01275
9.	-0.00319	32.4	0.00319
9.1	-0.00638	32.5	0.01913
9.2	-0.00638	32.6	0.00956
9.3	-0.00638	32.7	0.01275
9.4	-0.00319	32.8	0.00637

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	0.	32.9	0.01913
9.6	-0.00957	33.	0.01275
9.7	0.	33.1	0.00637
9.8	0.00319	33.2	0.01594
9.9	0.	33.3	0.00956
10.	-0.00638	33.4	0.01594
10.1	-0.00957	33.5	0.00637
10.2	-0.00319	33.6	0.00637
10.3	-0.00957	33.7	0.00956
10.4	-0.01276	33.8	0.00637
10.5	-0.00638	33.9	0.01275
10.6	-0.00319	34.	0.01275
10.7	0.	34.1	0.01275
10.8	-0.00319	34.2	0.00637
10.9	-0.00638	34.3	0.00956
11.	0.	34.4	0.01275
11.1	0.00319	34.5	0.00956
11.2	-0.00319	34.6	0.00956
11.3	-0.00638	34.7	0.00956
11.4	-0.00319	34.8	0.02232
11.5	-0.00638	34.9	0.01913
11.6	0.	35.	0.00637
11.7	0.	35.1	0.00637
11.8	0.00637	35.2	0.00637
11.9	0.	35.3	0.01275
12.	-0.00638	35.4	0.
12.1	0.	35.5	0.00319
12.2	-0.00957	35.6	0.01594
12.3	-0.00319	35.7	0.00956
12.4	0.	35.8	0.01594
12.5	-0.00319	35.9	0.00637
12.6	-0.01595	36.	0.00637
12.7	0.00319	36.1	0.01913
12.8	0.	36.2	0.00637
12.9	0.	36.3	0.00956
13.	-0.00319	36.4	0.01275
13.1	0.	36.5	0.01275
13.2	0.00319	36.6	0.00956
13.3	0.00956	36.7	0.01913
13.4	0.	36.8	0.01594
13.5	-0.00319	36.9	0.00956
13.6	-0.00638	37.	0.01594
13.7	-0.00957	37.1	0.00956
13.8	0.00319	37.2	0.00956
13.9	-0.00319	37.3	0.01275
14.	-0.00319	37.4	0.00319
14.1	0.00319	37.5	0.01594
14.2	0.00319	37.6	0.
14.3	-0.00319	37.7	0.01275
14.4	0.00319	37.8	0.00637
14.5	0.00637	37.9	0.01594
14.6	-0.00319	38.	0.00956
14.7	0.00319	38.1	0.01275
14.8	-0.00319	38.2	0.00637
14.9	0.	38.3	0.00956
15.	-0.00319	38.4	0.00956
15.1	0.00637	38.5	0.00637
15.2	-0.00638	38.6	0.01275
15.3	0.	38.7	0.00956
15.4	0.00956	38.8	0.01275
15.5	0.00637	38.9	0.00956
15.6	0.00956	39.	0.00956
15.7	0.00637	39.1	0.00637
15.8	0.00637	39.2	0.01913
15.9	0.	39.3	0.00956
16.	0.01594	39.4	0.01275

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00319	39.5	0.01594
16.2	0.00319	39.6	0.01594
16.3	0.00319	39.7	0.01275
16.4	-0.00319	39.8	-0.00319
16.5	-0.00319	39.9	0.00637
16.6	0.00319	40.	0.01594
16.7	0.	40.1	0.01594
16.8	0.00956	40.2	0.01594
16.9	0.00319	40.3	0.01275
17.	0.	40.4	0.02869
17.1	0.	40.5	0.01275
17.2	0.00637	40.6	0.01275
17.3	0.	40.7	0.01594
17.4	0.00637	40.8	0.01913
17.5	0.00956	40.9	0.01275
17.6	0.00319	41.	0.00637
17.7	0.	41.1	0.02551
17.8	0.00319	41.2	0.
17.9	0.00319	41.3	0.01275
18.	0.00637	41.4	0.01275
18.1	0.	41.5	0.00637
18.2	-0.00638	41.6	0.01275
18.3	0.00637	41.7	0.02232
18.4	0.00637	41.8	0.01275
18.5	0.00637	41.9	0.01913
18.6	-0.00638	42.	0.00956
18.7	0.00319	42.1	0.00637
18.8	0.00319	42.2	0.00956
18.9	0.00637	42.3	0.01594
19.	0.00319	42.4	0.00956
19.1	0.00956	42.5	0.03507
19.2	0.00956	42.6	0.01594
19.3	0.01275	42.7	0.00956
19.4	0.00637	42.8	0.01594
19.5	0.00956	42.9	0.00956
19.6	0.00956	43.	0.00956
19.7	0.00637	43.1	0.01275
19.8	0.00319	43.2	0.02551
19.9	-0.00319	43.3	0.01913
20.	0.00637	43.4	0.00637
20.1	0.00956	43.5	0.01594
20.2	0.	43.6	0.00956
20.3	0.00319	43.7	0.00956
20.4	-0.00319	43.8	0.01275
20.5	0.00637	43.9	0.01913
20.6	0.00956	44.	0.01275
20.7	0.00956	44.1	0.01275
20.8	0.00956	44.2	0.01275
20.9	0.01275	44.3	0.01275
21.	0.00319	44.4	0.00319
21.1	0.00319	44.5	0.01275
21.2	0.00319	44.6	0.00637
21.3	0.01594	44.7	0.02551
21.4	0.00956	44.8	0.00956
21.5	0.01594	44.9	0.01275
21.6	0.00956	45.	0.01594
21.7	0.	45.1	0.00956
21.8	0.00956	45.2	0.00956
21.9	0.00319	45.3	0.01594
22.	0.00956	45.4	0.01594
22.1	0.01275	45.5	0.02232
22.2	0.00637	45.6	0.01594
22.3	0.01275	45.7	0.01594
22.4	0.00956	45.8	0.01594
22.5	0.02232	45.9	0.01275
22.6	0.01275	46.	0.01275

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.00319	46.1	0.01275
22.8	0.01594	46.2	0.02869
22.9	0.00637	46.3	0.01275
23.	0.01913	46.4	0.01594
23.1	0.00956	46.5	0.02232
23.2	0.00637	46.6	0.01594
23.3	0.00956	46.7	0.01275

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.427

VISUAL ESTIMATION RESULTS

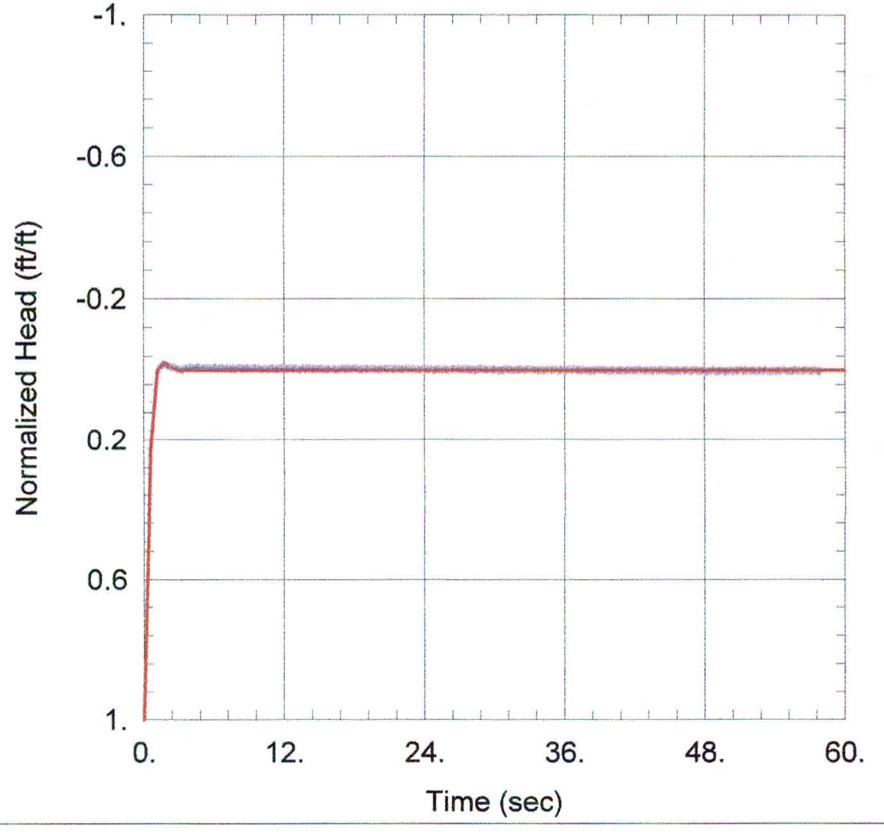
Estimated Parameters

Parameter	Estimate	
K	689.8	ft/day
Le	0.04597	ft

K = 0.2434 cm/sec
T = K*b = 1.368E+4 ft²/day (147.1 sq. cm/sec)
Le = 0.04597 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 51 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T84_Test2Springer-Gelhar.aqt
Date: 02/12/13 Time: 14:37:23

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T84
Test Date: 02/06/2013

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 431. ft/day
Le = 0.06399 ft

AQUIFER DATA

Saturated Thickness: 19.8 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T84)

Initial Displacement: 2.13 ft
Total Well Penetration Depth: 28.69 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 19.8 ft
Screen Length: 25. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:09:55

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/06/2013
Test Well: T84

AQUIFER DATA

Saturated Thickness: 19.8 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T84

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.13 ft
Static Water Column Height: 19.8 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 25. ft
Total Well Penetration Depth: 28.69 ft

No. of Observations: 581

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.127	29.1	-0.00318
0.1	1.805	29.2	-0.00318
0.2	1.346	29.3	-0.00318
0.3	1.049	29.4	-0.00318
0.4	0.8163	29.5	-0.00318
0.5	0.6345	29.6	0.
0.6	0.4783	29.7	-0.00637
0.7	0.3667	29.8	-0.00318
0.8	0.2647	29.9	-0.00318
0.9	0.1881	30.	-0.00318
1.	0.118	30.1	0.
1.1	0.07653	30.2	-0.00318
1.2	0.04146	30.3	0.
1.3	0.01276	30.4	0.00319
1.4	-0.01275	30.5	-0.00318
1.5	-0.02551	30.6	0.00319
1.6	-0.03188	30.7	0.
1.7	-0.03826	30.8	0.
1.8	-0.03507	30.9	-0.00318
1.9	-0.03826	31.	-0.00318
2.	-0.02869	31.1	-0.00637
2.1	-0.02869	31.2	-0.00637
2.2	-0.02232	31.3	-0.00637
2.3	-0.02232	31.4	-0.00318
2.4	-0.01913	31.5	-0.00318
2.5	-0.01913	31.6	0.
2.6	-0.01913	31.7	0.
2.7	-0.01594	31.8	-0.00318
2.8	-0.00956	31.9	-0.00318

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.00956	32.	0.
3.	-0.00956	32.1	-0.00318
3.1	-0.00956	32.2	-0.00318
3.2	-0.00637	32.3	-0.00637
3.3	-0.00637	32.4	0.
3.4	-0.00318	32.5	-0.00318
3.5	-0.01594	32.6	0.
3.6	-0.01275	32.7	-0.00318
3.7	-0.01275	32.8	-0.00637
3.8	-0.01275	32.9	-0.00318
3.9	-0.01913	33.	-0.00637
4.	-0.01594	33.1	-0.00637
4.1	-0.01594	33.2	-0.00637
4.2	-0.01594	33.3	-0.00318
4.3	-0.01594	33.4	-0.00637
4.4	-0.01594	33.5	0.
4.5	-0.02232	33.6	-0.00318
4.6	-0.01913	33.7	0.
4.7	-0.01913	33.8	0.00638
4.8	-0.01913	33.9	-0.00318
4.9	-0.01594	34.	0.
5.	-0.01594	34.1	-0.00318
5.1	-0.01594	34.2	0.
5.2	-0.01913	34.3	0.
5.3	-0.01594	34.4	0.
5.4	-0.01594	34.5	0.
5.5	-0.01594	34.6	-0.00318
5.6	-0.01594	34.7	-0.00318
5.7	-0.01594	34.8	-0.00637
5.8	-0.01594	34.9	-0.00318
5.9	-0.01594	35.	-0.00318
6.	-0.01594	35.1	-0.00318
6.1	-0.01913	35.2	-0.00318
6.2	-0.01913	35.3	-0.00318
6.3	-0.01594	35.4	-0.00637
6.4	-0.00956	35.5	0.00319
6.5	-0.01594	35.6	-0.00318
6.6	-0.01594	35.7	-0.00318
6.7	-0.01275	35.8	-0.00318
6.8	-0.01594	35.9	0.
6.9	-0.01275	36.	0.
7.	-0.01275	36.1	0.
7.1	-0.01275	36.2	0.
7.2	-0.01913	36.3	-0.00637
7.3	-0.01275	36.4	-0.00318
7.4	-0.00956	36.5	-0.00637
7.5	-0.01594	36.6	-0.00318
7.6	-0.00956	36.7	0.
7.7	-0.01913	36.8	-0.00637
7.8	-0.00956	36.9	-0.00956
7.9	-0.00956	37.	-0.00318
8.	-0.00956	37.1	-0.00318
8.1	-0.01594	37.2	0.
8.2	-0.01594	37.3	-0.00318
8.3	-0.01275	37.4	-0.00318
8.4	-0.01275	37.5	0.00319
8.5	-0.00956	37.6	-0.00318
8.6	-0.01275	37.7	-0.00318
8.7	-0.01275	37.8	-0.00318
8.8	-0.01913	37.9	0.00319
8.9	-0.01275	38.	0.
9.	-0.01275	38.1	0.
9.1	-0.01275	38.2	0.00319
9.2	-0.00956	38.3	0.00319
9.3	-0.01275	38.4	-0.00318
9.4	-0.01594	38.5	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.01275	38.6	0.00319
9.6	-0.01594	38.7	0.
9.7	-0.01275	38.8	-0.00637
9.8	-0.01275	38.9	0.
9.9	-0.01275	39.	-0.00318
10.	-0.01275	39.1	-0.00318
10.1	-0.00956	39.2	-0.00318
10.2	-0.00637	39.3	-0.00318
10.3	-0.01275	39.4	0.
10.4	-0.00637	39.5	0.
10.5	-0.01275	39.6	0.
10.6	-0.00637	39.7	0.
10.7	-0.01275	39.8	0.00319
10.8	-0.00956	39.9	0.00319
10.9	-0.00956	40.	0.
11.	-0.01275	40.1	0.
11.1	-0.00956	40.2	-0.00318
11.2	-0.01275	40.3	0.
11.3	-0.00956	40.4	0.00319
11.4	-0.00956	40.5	0.
11.5	-0.00637	40.6	0.
11.6	-0.01594	40.7	0.
11.7	-0.00956	40.8	0.
11.8	-0.01275	40.9	0.
11.9	-0.01275	41.	0.
12.	-0.00956	41.1	0.00319
12.1	-0.01275	41.2	0.
12.2	-0.01275	41.3	0.
12.3	-0.00956	41.4	0.
12.4	-0.00956	41.5	-0.00318
12.5	-0.00956	41.6	0.00319
12.6	-0.01594	41.7	0.
12.7	-0.00956	41.8	-0.00318
12.8	-0.00956	41.9	0.
12.9	-0.00956	42.	0.00319
13.	-0.00956	42.1	-0.00318
13.1	-0.01275	42.2	0.
13.2	-0.00637	42.3	-0.00318
13.3	-0.00956	42.4	0.00319
13.4	-0.00318	42.5	-0.00637
13.5	-0.00637	42.6	0.
13.6	-0.01594	42.7	0.
13.7	-0.01275	42.8	0.
13.8	-0.00956	42.9	0.
13.9	-0.00637	43.	0.
14.	-0.01275	43.1	0.00319
14.1	-0.01275	43.2	-0.00318
14.2	-0.00956	43.3	0.00319
14.3	-0.01275	43.4	0.
14.4	-0.00637	43.5	-0.00318
14.5	-0.00956	43.6	0.00638
14.6	-0.00956	43.7	0.
14.7	-0.00637	43.8	-0.00318
14.8	-0.00956	43.9	0.
14.9	-0.00956	44.	0.00319
15.	-0.00956	44.1	-0.00318
15.1	-0.00956	44.2	0.
15.2	-0.01275	44.3	-0.00318
15.3	-0.00318	44.4	0.
15.4	-0.00956	44.5	0.
15.5	-0.00637	44.6	-0.00318
15.6	-0.00956	44.7	0.
15.7	-0.00318	44.8	-0.00637
15.8	-0.00956	44.9	0.
15.9	-0.00637	45.	0.00319
16.	-0.01275	45.1	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00318	45.2	0.00319
16.2	-0.00956	45.3	0.00319
16.3	-0.00956	45.4	0.00319
16.4	-0.00637	45.5	0.
16.5	-0.00637	45.6	0.
16.6	-0.00637	45.7	0.
16.7	-0.00637	45.8	0.
16.8	-0.00637	45.9	0.
16.9	-0.00956	46.	0.00638
17.	-0.00956	46.1	-0.00318
17.1	-0.01275	46.2	-0.00318
17.2	-0.00956	46.3	0.
17.3	-0.00318	46.4	0.
17.4	-0.00956	46.5	-0.00318
17.5	-0.00956	46.6	0.
17.6	-0.00956	46.7	0.
17.7	-0.00956	46.8	0.00319
17.8	-0.00956	46.9	0.00638
17.9	-0.01275	47.	0.
18.	-0.00956	47.1	-0.00318
18.1	-0.00956	47.2	-0.00318
18.2	-0.00956	47.3	0.
18.3	-0.00956	47.4	0.
18.4	-0.01275	47.5	0.00638
18.5	-0.00637	47.6	0.
18.6	-0.00637	47.7	0.00319
18.7	-0.00637	47.8	0.
18.8	-0.00637	47.9	-0.00318
18.9	-0.00956	48.	0.00638
19.	-0.00637	48.1	0.00319
19.1	-0.00956	48.2	0.00957
19.2	-0.00956	48.3	0.00319
19.3	-0.00637	48.4	0.00319
19.4	-0.00637	48.5	-0.00318
19.5	-0.00956	48.6	0.00638
19.6	-0.00637	48.7	-0.00318
19.7	-0.00637	48.8	-0.00637
19.8	-0.00956	48.9	0.00638
19.9	-0.00637	49.	0.00638
20.	-0.00637	49.1	0.
20.1	-0.00637	49.2	0.00319
20.2	-0.00318	49.3	0.00638
20.3	-0.01275	49.4	0.
20.4	-0.00637	49.5	0.
20.5	-0.00637	49.6	0.00319
20.6	-0.00956	49.7	0.00319
20.7	-0.00956	49.8	0.00957
20.8	-0.00637	49.9	0.00319
20.9	-0.00637	50.	0.00319
21.	-0.00956	50.1	0.00319
21.1	-0.00318	50.2	0.
21.2	-0.00956	50.3	0.
21.3	-0.00318	50.4	0.00319
21.4	-0.00956	50.5	0.00638
21.5	-0.00318	50.6	0.
21.6	-0.00956	50.7	0.
21.7	-0.00318	50.8	0.00319
21.8	-0.00637	50.9	0.
21.9	-0.00956	51.	0.00319
22.	-0.00318	51.1	-0.00318
22.1	-0.00637	51.2	-0.00318
22.2	-0.00318	51.3	0.00319
22.3	0.	51.4	0.00319
22.4	-0.00318	51.5	-0.00318
22.5	-0.01275	51.6	0.00319
22.6	-0.00318	51.7	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.00637	51.8	0.
22.8	-0.00956	51.9	0.00319
22.9	-0.00318	52.	0.00319
23.	-0.00637	52.1	-0.00318
23.1	-0.00956	52.2	0.00638
23.2	-0.00318	52.3	0.
23.3	0.	52.4	0.00319
23.4	-0.00318	52.5	0.00638
23.5	-0.00956	52.6	0.
23.6	-0.00318	52.7	0.
23.7	0.	52.8	0.
23.8	-0.00637	52.9	0.00319
23.9	-0.00637	53.	0.00638
24.	-0.00318	53.1	0.00638
24.1	-0.00318	53.2	0.
24.2	-0.00637	53.3	-0.00318
24.3	-0.00637	53.4	0.00319
24.4	-0.00318	53.5	0.00638
24.5	-0.00637	53.6	0.00638
24.6	-0.00637	53.7	0.00638
24.7	-0.00637	53.8	0.
24.8	0.	53.9	0.00638
24.9	0.	54.	0.
25.	-0.00318	54.1	0.00319
25.1	-0.00637	54.2	0.00638
25.2	-0.00318	54.3	0.00319
25.3	-0.00637	54.4	0.
25.4	-0.00637	54.5	0.00319
25.5	-0.00318	54.6	0.00319
25.6	-0.00318	54.7	-0.00318
25.7	0.	54.8	-0.00318
25.8	-0.00956	54.9	0.
25.9	-0.00318	55.	0.00319
26.	-0.00318	55.1	0.00638
26.1	0.	55.2	0.00319
26.2	0.	55.3	0.00319
26.3	-0.00637	55.4	0.00319
26.4	-0.00637	55.5	0.00319
26.5	-0.00637	55.6	0.00319
26.6	-0.00956	55.7	0.
26.7	-0.00637	55.8	-0.00318
26.8	-0.00318	55.9	0.
26.9	-0.00637	56.	0.
27.	-0.01275	56.1	0.00319
27.1	-0.00637	56.2	0.
27.2	-0.00318	56.3	0.00319
27.3	-0.00318	56.4	0.00319
27.4	-0.00956	56.5	0.00319
27.5	-0.00318	56.6	0.
27.6	-0.00956	56.7	0.
27.7	-0.00637	56.8	0.
27.8	-0.00318	56.9	0.
27.9	-0.00637	57.	0.00319
28.	0.	57.1	0.00319
28.1	-0.00318	57.2	0.00638
28.2	-0.00318	57.3	0.
28.3	-0.00318	57.4	0.
28.4	0.	57.5	0.
28.5	-0.00318	57.6	0.
28.6	-0.00318	57.7	0.00319
28.7	-0.00637	57.8	0.00638
28.8	-0.00956	57.9	0.00957
28.9	-0.00956	58.	0.
29.	-0.00318		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.538

VISUAL ESTIMATION RESULTS

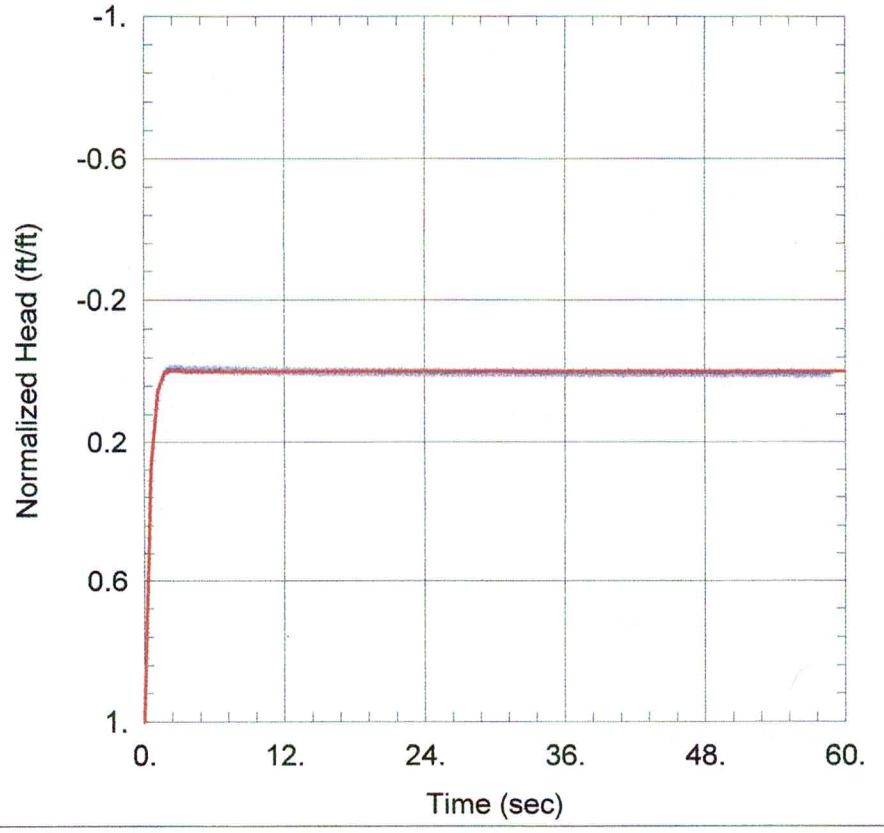
Estimated Parameters

Parameter	Estimate	
K	426.8	ft/day
Le	0.06397	ft

K = 0.1506 cm/sec
T = K*b = 8450. ft²/day (90.86 sq. cm/sec)
Le = 0.06397 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 46.5 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T86_Test1Springer-Gelhar.aqt
Date: 02/12/13 Time: 14:38:40

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T86
Test Date: 02/07/2013

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 391. ft/day
Le = 0.06711 ft

AQUIFER DATA

Saturated Thickness: 19.93 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T86)

Initial Displacement: 2.68 ft
Total Well Penetration Depth: 28.72 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 19.93 ft
Screen Length: 25. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:10:46

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/2013
Test Well: T86

AQUIFER DATA

Saturated Thickness: 19.93 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T86

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.68 ft
Static Water Column Height: 19.93 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 25. ft
Total Well Penetration Depth: 28.72 ft

No. of Observations: 589

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.682	29.5	0.00638
0.1	2.197	29.6	0.00638
0.2	2.002	29.7	0.00638
0.3	1.598	29.8	0.00638
0.4	1.269	29.9	0.00957
0.5	1.027	30.	0.00957
0.6	0.8354	30.1	0.00957
0.7	0.6824	30.2	0.
0.8	0.5772	30.3	0.00319
0.9	0.4592	30.4	0.00957
1.	0.3667	30.5	0.00638
1.1	0.2806	30.6	0.00957
1.2	0.2137	30.7	0.00638
1.3	0.1722	30.8	0.00957
1.4	0.1244	30.9	0.01276
1.5	0.09248	31.	0.00638
1.6	0.06059	31.1	0.00957
1.7	0.03508	31.2	0.00957
1.8	0.02232	31.3	0.00638
1.9	-0.00637	31.4	0.00957
2.	-0.01275	31.5	0.01276
2.1	-0.00956	31.6	-0.00319
2.2	-0.02232	31.7	0.00319
2.3	-0.02551	31.8	0.01276
2.4	-0.02232	31.9	0.00957
2.5	-0.01913	32.	0.01276
2.6	-0.02232	32.1	0.01595
2.7	-0.02551	32.2	0.01276
2.8	-0.02551	32.3	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.02232	32.4	0.00957
3.	-0.02232	32.5	0.01276
3.1	-0.02869	32.6	0.01276
3.2	-0.01594	32.7	0.01595
3.3	-0.01913	32.8	0.00638
3.4	-0.01594	32.9	0.01276
3.5	-0.00637	33.	0.00957
3.6	-0.01275	33.1	0.01595
3.7	-0.00956	33.2	0.01595
3.8	-0.00956	33.3	0.00638
3.9	-0.01594	33.4	0.00638
4.	-0.01275	33.5	0.01595
4.1	-0.00956	33.6	0.01276
4.2	-0.01275	33.7	0.00638
4.3	-0.01913	33.8	0.01276
4.4	-0.01594	33.9	0.00638
4.5	-0.01594	34.	0.01595
4.6	-0.00956	34.1	0.00638
4.7	-0.00956	34.2	0.01595
4.8	-0.01913	34.3	0.00957
4.9	-0.01275	34.4	0.02232
5.	-0.00956	34.5	0.00638
5.1	-0.01275	34.6	0.00319
5.2	-0.01594	34.7	0.00957
5.3	-0.01594	34.8	0.00638
5.4	-0.01594	34.9	0.01276
5.5	-0.01594	35.	0.01914
5.6	-0.01594	35.1	0.00957
5.7	-0.00637	35.2	0.00957
5.8	-0.01275	35.3	0.00957
5.9	-0.01275	35.4	0.
6.	-0.01913	35.5	0.01595
6.1	-0.01594	35.6	0.01276
6.2	-0.01594	35.7	0.00638
6.3	-0.01913	35.8	0.01595
6.4	-0.00637	35.9	0.01595
6.5	-0.02232	36.	0.00957
6.6	-0.00637	36.1	0.01595
6.7	-0.01275	36.2	0.01914
6.8	-0.00319	36.3	0.01276
6.9	-0.00956	36.4	0.01276
7.	-0.01275	36.5	0.00957
7.1	-0.01275	36.6	0.00957
7.2	-0.01275	36.7	0.00957
7.3	-0.01275	36.8	0.00319
7.4	-0.00637	36.9	0.01595
7.5	-0.00956	37.	0.01595
7.6	-0.00956	37.1	0.01595
7.7	-0.00956	37.2	0.00957
7.8	0.	37.3	0.01595
7.9	-0.01594	37.4	0.01276
8.	-0.00319	37.5	0.00957
8.1	-0.00319	37.6	0.01595
8.2	-0.01594	37.7	0.00638
8.3	-0.00319	37.8	0.01276
8.4	-0.00637	37.9	0.00319
8.5	-0.00319	38.	0.00957
8.6	-0.00637	38.1	0.01914
8.7	-0.00637	38.2	0.01914
8.8	-0.01275	38.3	0.00638
8.9	-0.01275	38.4	0.01595
9.	-0.00637	38.5	0.00957
9.1	-0.00319	38.6	0.00957
9.2	0.	38.7	0.01914
9.3	-0.00956	38.8	0.00957
9.4	-0.01275	38.9	0.00957

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00637	39.	0.00957
9.6	-0.00319	39.1	0.01595
9.7	-0.01275	39.2	0.01595
9.8	0.	39.3	0.01276
9.9	-0.00319	39.4	0.00957
10.	-0.00319	39.5	0.01276
10.1	-0.00319	39.6	0.00957
10.2	0.	39.7	0.01276
10.3	-0.00637	39.8	0.00957
10.4	-0.00319	39.9	0.00957
10.5	-0.00956	40.	0.00638
10.6	-0.00637	40.1	0.01276
10.7	0.00319	40.2	0.01595
10.8	-0.00956	40.3	0.00638
10.9	-0.00319	40.4	0.00638
11.	-0.00319	40.5	0.01276
11.1	-0.00319	40.6	0.00957
11.2	-0.00637	40.7	0.01595
11.3	0.	40.8	0.01276
11.4	-0.01275	40.9	0.01276
11.5	0.00638	41.	0.02232
11.6	0.00638	41.1	0.01595
11.7	0.00638	41.2	0.00957
11.8	-0.00319	41.3	0.01595
11.9	0.	41.4	0.00957
12.	-0.00319	41.5	0.00319
12.1	-0.00956	41.6	0.00638
12.2	-0.00319	41.7	0.01276
12.3	-0.00956	41.8	0.00957
12.4	-0.00319	41.9	0.01595
12.5	0.	42.	0.01276
12.6	-0.00319	42.1	0.00957
12.7	0.00319	42.2	0.01595
12.8	-0.00319	42.3	0.01276
12.9	-0.00319	42.4	0.01276
13.	0.00319	42.5	0.00638
13.1	0.00319	42.6	0.01595
13.2	0.	42.7	0.01276
13.3	-0.00637	42.8	0.00638
13.4	-0.00319	42.9	0.01276
13.5	0.00319	43.	0.00957
13.6	0.00319	43.1	0.01595
13.7	-0.00319	43.2	0.00957
13.8	0.	43.3	0.00638
13.9	-0.00956	43.4	0.01914
14.	0.00319	43.5	0.01595
14.1	-0.00637	43.6	0.01276
14.2	-0.00319	43.7	0.00638
14.3	0.00319	43.8	0.01595
14.4	0.00638	43.9	0.00957
14.5	0.	44.	0.01276
14.6	0.00319	44.1	0.01276
14.7	0.	44.2	0.00957
14.8	0.00319	44.3	0.01595
14.9	0.00319	44.4	0.01276
15.	0.00638	44.5	0.01914
15.1	0.00638	44.6	0.01276
15.2	0.00638	44.7	0.00957
15.3	0.00319	44.8	0.00638
15.4	0.00638	44.9	0.01276
15.5	0.00319	45.	0.00638
15.6	0.	45.1	0.01276
15.7	0.00319	45.2	0.01914
15.8	0.00319	45.3	0.00638
15.9	0.00319	45.4	0.00957
16.	0.00319	45.5	0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	0.00319	45.6	0.01595
16.2	0.00638	45.7	0.00957
16.3	0.	45.8	0.00957
16.4	0.00638	45.9	0.01276
16.5	-0.00319	46.	0.01595
16.6	0.00638	46.1	0.01276
16.7	0.	46.2	0.00638
16.8	0.00319	46.3	0.01276
16.9	0.00319	46.4	0.00957
17.	0.00638	46.5	0.00957
17.1	0.00319	46.6	0.01595
17.2	0.00319	46.7	0.01595
17.3	-0.00637	46.8	0.00638
17.4	0.00638	46.9	0.01276
17.5	0.00319	47.	0.00957
17.6	0.00638	47.1	0.01595
17.7	0.00638	47.2	0.02232
17.8	0.00638	47.3	0.00957
17.9	0.	47.4	0.00957
18.	0.00957	47.5	0.00957
18.1	0.00319	47.6	0.01914
18.2	0.	47.7	0.01276
18.3	0.00957	47.8	0.00957
18.4	-0.00319	47.9	0.01595
18.5	0.00319	48.	0.00957
18.6	0.00638	48.1	0.01595
18.7	0.00638	48.2	0.00957
18.8	0.	48.3	0.01276
18.9	0.00957	48.4	0.
19.	0.	48.5	0.01276
19.1	0.00319	48.6	0.01276
19.2	0.00319	48.7	0.01595
19.3	0.00957	48.8	0.01595
19.4	0.00319	48.9	0.01276
19.5	0.00957	49.	0.01595
19.6	0.00319	49.1	0.01914
19.7	0.	49.2	0.01276
19.8	0.00319	49.3	0.01595
19.9	0.00638	49.4	0.01595
20.	0.00638	49.5	0.02232
20.1	0.00957	49.6	0.01276
20.2	0.	49.7	0.01595
20.3	0.	49.8	0.01914
20.4	0.01276	49.9	0.01276
20.5	0.00638	50.	0.01914
20.6	0.01595	50.1	0.01595
20.7	0.00957	50.2	0.00957
20.8	0.	50.3	0.00638
20.9	0.00319	50.4	0.01595
21.	0.	50.5	0.01276
21.1	0.00319	50.6	0.01595
21.2	0.	50.7	0.00957
21.3	0.01276	50.8	0.00957
21.4	0.00319	50.9	0.00957
21.5	0.00319	51.	0.01276
21.6	0.00957	51.1	0.01276
21.7	0.01276	51.2	0.00957
21.8	0.00319	51.3	0.01595
21.9	0.00319	51.4	0.01595
22.	0.00638	51.5	0.01914
22.1	-0.00956	51.6	0.01595
22.2	0.01595	51.7	0.00638
22.3	0.00638	51.8	0.01595
22.4	0.00319	51.9	0.01276
22.5	0.00638	52.	0.01595
22.6	0.00638	52.1	0.01276

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	0.00638	52.2	0.01276
22.8	0.01276	52.3	0.01914
22.9	0.00638	52.4	0.01595
23.	0.00957	52.5	0.01595
23.1	0.00638	52.6	0.01914
23.2	0.00319	52.7	0.02551
23.3	0.00957	52.8	0.01595
23.4	0.01276	52.9	0.01914
23.5	0.00638	53.	0.01595
23.6	0.01276	53.1	0.01276
23.7	0.00957	53.2	0.01595
23.8	0.	53.3	0.01595
23.9	0.00957	53.4	0.00957
24.	0.00957	53.5	0.02232
24.1	0.00638	53.6	0.01595
24.2	0.00319	53.7	0.01595
24.3	0.00957	53.8	0.01595
24.4	0.00638	53.9	0.01914
24.5	0.00638	54.	0.00638
24.6	0.00638	54.1	0.01595
24.7	0.01914	54.2	0.02232
24.8	0.00638	54.3	0.01276
24.9	0.01276	54.4	0.00638
25.	0.	54.5	0.01595
25.1	0.00957	54.6	0.01276
25.2	0.00319	54.7	0.01276
25.3	0.00319	54.8	0.01595
25.4	0.00957	54.9	0.01595
25.5	0.00957	55.	0.01595
25.6	0.00638	55.1	0.01276
25.7	0.01914	55.2	0.01595
25.8	0.00319	55.3	0.02232
25.9	0.01276	55.4	0.01276
26.	0.01595	55.5	0.
26.1	0.00638	55.6	0.01276
26.2	0.00319	55.7	0.01914
26.3	0.01595	55.8	0.02551
26.4	0.01276	55.9	0.01914
26.5	0.01276	56.	0.02551
26.6	0.00638	56.1	0.01914
26.7	0.01276	56.2	0.01276
26.8	0.00957	56.3	0.01276
26.9	0.00957	56.4	0.01914
27.	0.01276	56.5	0.01914
27.1	0.01276	56.6	0.01914
27.2	0.01276	56.7	0.01595
27.3	0.01276	56.8	0.01276
27.4	0.00319	56.9	0.01276
27.5	0.00957	57.	0.01276
27.6	0.00638	57.1	0.02232
27.7	0.01276	57.2	0.02232
27.8	0.	57.3	0.01276
27.9	0.01276	57.4	0.01595
28.	0.01914	57.5	0.01595
28.1	0.01276	57.6	0.01595
28.2	0.00319	57.7	0.02551
28.3	0.00957	57.8	0.01914
28.4	0.00319	57.9	0.01914
28.5	0.00957	58.	0.01914
28.6	0.01276	58.1	0.01914
28.7	0.00957	58.2	0.00957
28.8	0.00319	58.3	0.01914
28.9	0.01595	58.4	0.01276
29.	0.00638	58.5	0.01595
29.1	0.01276	58.6	0.01914
29.2	0.00638	58.7	0.01595

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	0.00957	58.8	0.01914
29.4	0.00957		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.54

VISUAL ESTIMATION RESULTS

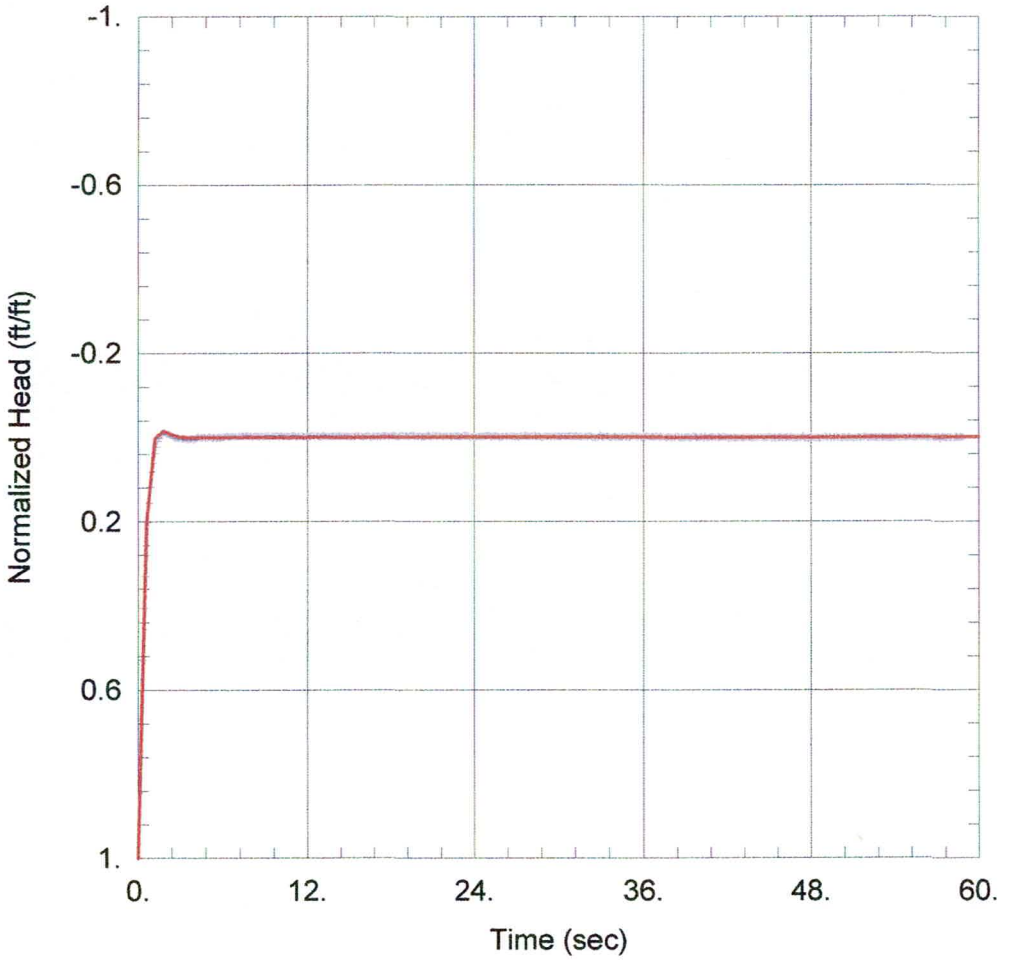
Estimated Parameters

Parameter	Estimate	
K	391.	ft/day
Le	0.06711	ft

K = 0.1379 cm/sec
T = K*b = 7792.7 ft²/day (83.79 sq. cm/sec)
Le = 0.06711 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 46 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T88_Test2Springer-Gelhar.aqt
Date: 02/14/13 Time: 09:12:20

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T88
Test Date: 02/06/2013

AQUIFER DATA

Saturated Thickness: 19.99 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T88)

Initial Displacement: 2.51 ft
Total Well Penetration Depth: 28.52 ft
Casing Radius: 0.02083 ft
Static Water Column Height: 19.99 ft
Screen Length: 25. ft
Well Radius: 0.0833 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Springer-Gelhar
K = 316.3 ft/day Le = 0.08165 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:13:00

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/06/2013
Test Well: T88

AQUIFER DATA

Saturated Thickness: 19.99 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T88

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.51 ft
Static Water Column Height: 19.99 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 25. ft
Total Well Penetration Depth: 28.52 ft

No. of Observations: 590

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.506	29.5	0.
0.1	2.117	29.6	-0.00957
0.2	1.706	29.7	-0.00319
0.3	1.326	29.8	-0.00319
0.4	1.017	29.9	-0.00319
0.5	0.8259	30.	-0.00319
0.6	0.6409	30.1	-0.00319
0.7	0.5038	30.2	0.
0.8	0.389	30.3	-0.00638
0.9	0.2934	30.4	-0.00638
1.	0.2009	30.5	-0.00319
1.1	0.1499	30.6	-0.00319
1.2	0.09247	30.7	-0.00638
1.3	0.0542	30.8	-0.00319
1.4	0.01913	30.9	-0.00638
1.5	0.00318	31.	-0.00319
1.6	-0.01914	31.1	-0.00319
1.7	-0.02551	31.2	-0.00319
1.8	-0.03189	31.3	-0.00638
1.9	-0.03189	31.4	-0.00319
2.	-0.02551	31.5	-0.00319
2.1	-0.02233	31.6	-0.00319
2.2	-0.01914	31.7	0.
2.3	-0.01914	31.8	-0.00638
2.4	-0.01276	31.9	0.
2.5	-0.00638	32.	-0.00638
2.6	0.00318	32.1	0.
2.7	0.	32.2	-0.00638
2.8	0.00318	32.3	-0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	0.	32.4	-0.00319
3.	0.00956	32.5	0.00318
3.1	0.00637	32.6	0.
3.2	0.00318	32.7	0.00637
3.3	0.00637	32.8	0.00318
3.4	0.00956	32.9	0.00318
3.5	0.01275	33.	-0.01276
3.6	0.00956	33.1	-0.00319
3.7	0.00637	33.2	0.
3.8	0.00637	33.3	-0.00319
3.9	0.01275	33.4	-0.00319
4.	0.00956	33.5	-0.00319
4.1	0.00318	33.6	-0.00319
4.2	0.	33.7	0.
4.3	-0.00638	33.8	0.
4.4	0.	33.9	-0.00319
4.5	0.	34.	-0.00319
4.6	-0.00319	34.1	0.
4.7	-0.00319	34.2	0.00318
4.8	0.	34.3	-0.00319
4.9	0.	34.4	0.
5.	-0.00319	34.5	0.
5.1	-0.00638	34.6	-0.00319
5.2	0.	34.7	-0.00319
5.3	0.00318	34.8	0.
5.4	-0.00319	34.9	-0.00319
5.5	0.	35.	0.
5.6	0.	35.1	0.
5.7	-0.00319	35.2	-0.00638
5.8	0.	35.3	-0.00638
5.9	0.	35.4	-0.00319
6.	-0.00319	35.5	-0.00638
6.1	-0.00319	35.6	0.00318
6.2	-0.00638	35.7	-0.00319
6.3	-0.00957	35.8	-0.00319
6.4	-0.00319	35.9	0.
6.5	-0.00319	36.	-0.00319
6.6	-0.00638	36.1	0.
6.7	-0.00957	36.2	-0.00638
6.8	-0.00638	36.3	-0.00319
6.9	-0.00638	36.4	-0.00319
7.	-0.00638	36.5	0.
7.1	-0.00638	36.6	-0.00319
7.2	-0.00957	36.7	-0.00319
7.3	-0.00638	36.8	0.
7.4	-0.00957	36.9	-0.00319
7.5	-0.00638	37.	-0.00638
7.6	-0.00957	37.1	0.00318
7.7	-0.01276	37.2	-0.00319
7.8	-0.00957	37.3	-0.00319
7.9	-0.00638	37.4	-0.00319
8.	-0.00957	37.5	-0.00319
8.1	-0.00319	37.6	0.
8.2	-0.00957	37.7	-0.00319
8.3	-0.00957	37.8	-0.00638
8.4	-0.00957	37.9	0.
8.5	-0.00638	38.	0.
8.6	-0.00638	38.1	-0.00319
8.7	-0.00957	38.2	0.00318
8.8	-0.00638	38.3	-0.00638
8.9	-0.00638	38.4	-0.00319
9.	-0.00957	38.5	-0.00319
9.1	-0.00957	38.6	0.00318
9.2	-0.01276	38.7	0.
9.3	0.00318	38.8	0.
9.4	-0.01276	38.9	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00957	39.	0.
9.6	-0.00957	39.1	-0.00638
9.7	-0.00957	39.2	-0.00319
9.8	-0.00957	39.3	0.
9.9	-0.00957	39.4	0.
10.	-0.00319	39.5	-0.00319
10.1	-0.00957	39.6	-0.00638
10.2	-0.01276	39.7	-0.00638
10.3	-0.00638	39.8	0.
10.4	-0.00638	39.9	0.
10.5	-0.00957	40.	0.
10.6	-0.00638	40.1	-0.00319
10.7	-0.00638	40.2	-0.00319
10.8	-0.00638	40.3	0.00318
10.9	-0.00957	40.4	-0.00638
11.	-0.00957	40.5	0.
11.1	-0.01276	40.6	0.00318
11.2	-0.00319	40.7	-0.00319
11.3	-0.00957	40.8	-0.00319
11.4	-0.00638	40.9	-0.00319
11.5	-0.00957	41.	-0.00319
11.6	-0.00638	41.1	0.
11.7	-0.00638	41.2	0.
11.8	-0.00638	41.3	-0.00319
11.9	-0.00638	41.4	-0.00319
12.	-0.00957	41.5	0.
12.1	-0.00638	41.6	-0.00319
12.2	-0.00638	41.7	-0.00319
12.3	-0.01276	41.8	-0.00319
12.4	-0.01276	41.9	-0.00319
12.5	-0.00319	42.	0.
12.6	-0.00957	42.1	0.00318
12.7	-0.00957	42.2	0.
12.8	-0.00957	42.3	0.
12.9	-0.00319	42.4	0.
13.	-0.00638	42.5	0.00318
13.1	-0.00957	42.6	0.
13.2	-0.01276	42.7	0.
13.3	-0.00638	42.8	0.00318
13.4	-0.00638	42.9	0.
13.5	-0.00957	43.	0.
13.6	-0.00638	43.1	0.
13.7	-0.00638	43.2	0.
13.8	-0.00638	43.3	0.
13.9	-0.00957	43.4	0.
14.	-0.00638	43.5	0.
14.1	-0.00957	43.6	0.
14.2	-0.00319	43.7	0.00318
14.3	-0.00957	43.8	0.
14.4	-0.00638	43.9	0.
14.5	-0.00638	44.	0.00318
14.6	-0.00957	44.1	0.
14.7	-0.00638	44.2	0.
14.8	-0.00638	44.3	0.
14.9	-0.00638	44.4	-0.00319
15.	-0.00319	44.5	0.00318
15.1	-0.00319	44.6	0.
15.2	-0.00638	44.7	0.
15.3	-0.00638	44.8	0.
15.4	-0.00319	44.9	-0.00319
15.5	-0.00957	45.	-0.00319
15.6	-0.00957	45.1	0.
15.7	-0.00957	45.2	0.00318
15.8	-0.00638	45.3	0.
15.9	-0.00319	45.4	0.00318
16.	-0.00319	45.5	0.00318

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00638	45.6	0.
16.2	-0.00638	45.7	0.
16.3	-0.00957	45.8	-0.00319
16.4	-0.00957	45.9	0.00318
16.5	-0.00319	46.	0.00318
16.6	0.	46.1	-0.00319
16.7	-0.00957	46.2	0.00318
16.8	-0.00638	46.3	-0.00319
16.9	-0.00638	46.4	0.00637
17.	-0.00638	46.5	-0.00319
17.1	-0.00638	46.6	-0.00319
17.2	-0.00319	46.7	0.00318
17.3	-0.00638	46.8	0.00318
17.4	-0.00638	46.9	0.00318
17.5	-0.00957	47.	0.
17.6	-0.00638	47.1	0.00318
17.7	-0.00957	47.2	0.
17.8	-0.00319	47.3	0.
17.9	-0.00638	47.4	-0.00638
18.	-0.00957	47.5	0.00318
18.1	-0.00638	47.6	0.00318
18.2	-0.00957	47.7	0.00318
18.3	-0.00638	47.8	0.00637
18.4	-0.00638	47.9	0.00318
18.5	0.	48.	-0.00319
18.6	-0.00319	48.1	0.
18.7	-0.00957	48.2	0.00637
18.8	-0.00957	48.3	0.
18.9	-0.00638	48.4	0.00637
19.	-0.00638	48.5	0.00318
19.1	-0.00638	48.6	0.00318
19.2	-0.00638	48.7	0.00318
19.3	-0.00319	48.8	0.00318
19.4	-0.00638	48.9	0.
19.5	-0.00957	49.	0.
19.6	-0.00957	49.1	-0.00319
19.7	-0.00638	49.2	0.
19.8	-0.00957	49.3	0.00318
19.9	-0.00319	49.4	-0.00319
20.	-0.00638	49.5	0.00637
20.1	-0.00638	49.6	0.
20.2	0.	49.7	0.
20.3	-0.00319	49.8	-0.00319
20.4	-0.00319	49.9	0.
20.5	-0.00319	50.	0.
20.6	-0.00638	50.1	0.00318
20.7	-0.00957	50.2	0.00318
20.8	-0.00319	50.3	0.00318
20.9	-0.00319	50.4	-0.00319
21.	-0.00957	50.5	0.00318
21.1	-0.00319	50.6	0.00318
21.2	-0.00957	50.7	0.
21.3	-0.00319	50.8	0.
21.4	-0.00957	50.9	0.00318
21.5	-0.00319	51.	0.00637
21.6	-0.00638	51.1	0.00318
21.7	-0.00319	51.2	0.00318
21.8	-0.00319	51.3	0.
21.9	-0.00638	51.4	0.
22.	-0.00638	51.5	0.00318
22.1	-0.00319	51.6	0.
22.2	-0.00638	51.7	-0.00319
22.3	-0.00319	51.8	0.00318
22.4	-0.00319	51.9	-0.00638
22.5	-0.00957	52.	0.
22.6	-0.00638	52.1	0.00318

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.00638	52.2	0.
22.8	-0.00638	52.3	0.
22.9	-0.00319	52.4	0.
23.	-0.00319	52.5	0.
23.1	-0.00319	52.6	0.
23.2	-0.00638	52.7	0.00318
23.3	-0.00638	52.8	0.00318
23.4	-0.00957	52.9	0.00318
23.5	-0.00638	53.	-0.00319
23.6	-0.00638	53.1	0.00318
23.7	0.	53.2	0.
23.8	0.	53.3	0.00318
23.9	-0.00638	53.4	0.00318
24.	-0.00319	53.5	0.00318
24.1	0.	53.6	0.00318
24.2	-0.00319	53.7	0.
24.3	-0.00319	53.8	0.00318
24.4	-0.00319	53.9	0.00318
24.5	-0.00319	54.	0.
24.6	-0.00638	54.1	-0.00319
24.7	-0.00319	54.2	0.00318
24.8	-0.00638	54.3	0.00318
24.9	-0.00638	54.4	0.
25.	-0.00957	54.5	0.
25.1	-0.00957	54.6	0.
25.2	-0.00319	54.7	0.
25.3	-0.00319	54.8	0.00637
25.4	-0.00638	54.9	-0.00319
25.5	-0.00638	55.	0.00318
25.6	-0.00319	55.1	-0.00319
25.7	-0.00638	55.2	0.00637
25.8	0.00318	55.3	0.
25.9	0.	55.4	0.
26.	-0.00319	55.5	0.00318
26.1	-0.00319	55.6	0.
26.2	-0.00957	55.7	-0.00319
26.3	-0.00319	55.8	0.00318
26.4	-0.00638	55.9	0.
26.5	-0.00319	56.	0.
26.6	-0.00638	56.1	0.
26.7	-0.00319	56.2	0.00318
26.8	-0.00638	56.3	0.00318
26.9	-0.00319	56.4	0.00318
27.	-0.00319	56.5	0.00318
27.1	0.	56.6	0.
27.2	0.	56.7	0.
27.3	-0.00638	56.8	0.00318
27.4	-0.00638	56.9	0.
27.5	0.	57.	-0.00319
27.6	-0.00957	57.1	0.00318
27.7	-0.00638	57.2	0.01275
27.8	-0.00319	57.3	0.
27.9	-0.00319	57.4	0.
28.	-0.00319	57.5	0.00318
28.1	-0.00319	57.6	0.00637
28.2	-0.00638	57.7	0.00318
28.3	-0.00638	57.8	0.00318
28.4	-0.00319	57.9	0.
28.5	-0.00319	58.	0.00318
28.6	-0.00319	58.1	0.00637
28.7	-0.00319	58.2	0.00637
28.8	0.	58.3	0.
28.9	0.	58.4	0.
29.	-0.00319	58.5	0.00637
29.1	-0.00319	58.6	0.
29.2	-0.00319	58.7	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	-0.00319	58.8	0.
29.4	-0.00319	58.9	0.

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.536

VISUAL ESTIMATION RESULTS

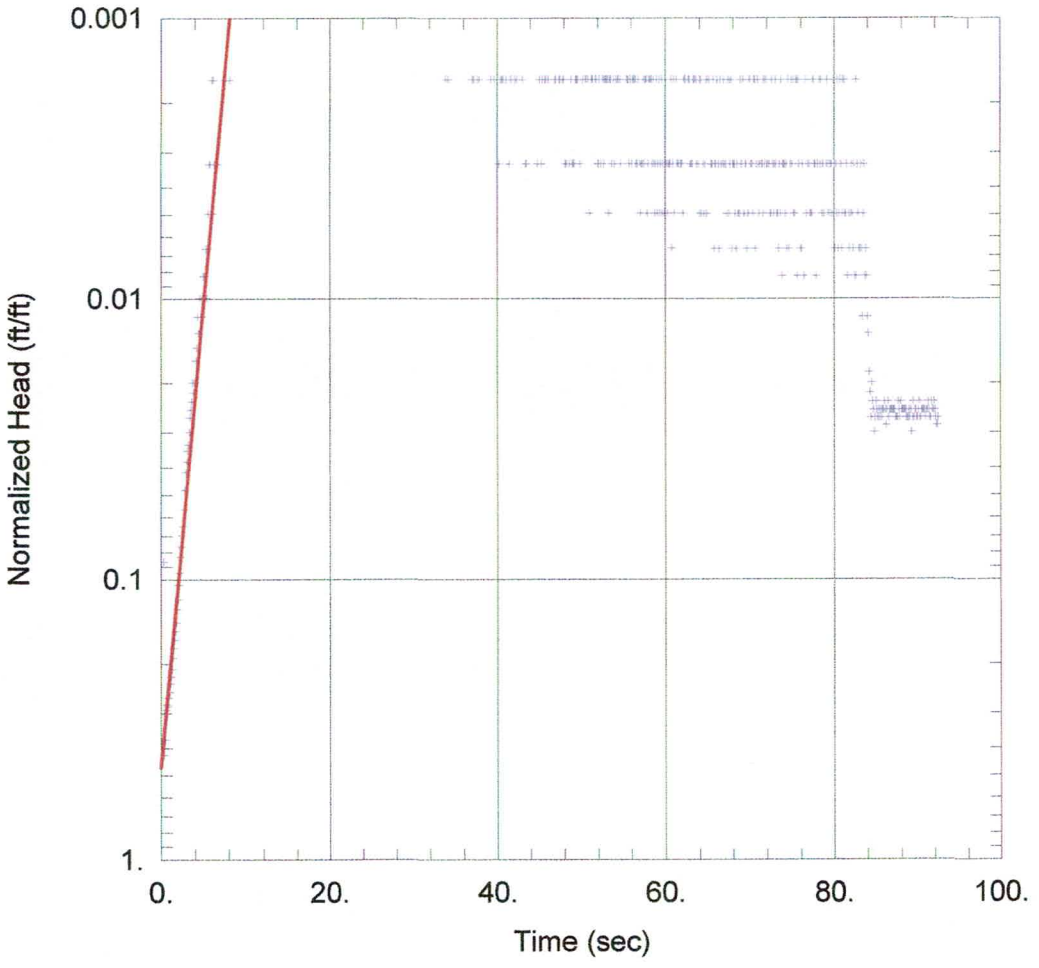
Estimated Parameters

Parameter	Estimate	
K	316.3	ft/day
Le	0.08165	ft

K = 0.1116 cm/sec
T = K*b = 6323.5 ft²/day (67.99 sq. cm/sec)
Le = 0.08165 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 43 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T89_Test4Hvorslev.aqt
Date: 02/14/13 Time: 11:05:03

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T89
Test Date: 02/07/2013

AQUIFER DATA

Saturated Thickness: 23.86 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T89)

Initial Displacement: 1.93 ft
Total Well Penetration Depth: 28.26 ft
Casing Radius: 0.02083 ft
Static Water Column Height: 23.86 ft
Screen Length: 25. ft
Well Radius: 0.0833 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 2.428 ft/day
y0 = 0.903 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 11:02:16

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/2013
Test Well: T89

AQUIFER DATA

Saturated Thickness: 23.86 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T89

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 1.93 ft
Static Water Column Height: 23.86 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 25. ft
Total Well Penetration Depth: 28.26 ft

No. of Observations: 925

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.929	46.3	0.
0.1	0.743	46.4	-0.00319
0.2	-0.271	46.5	0.
0.3	0.1658	46.6	-0.00319
0.4	0.8131	46.7	0.
0.5	0.7175	46.8	0.
0.6	0.5612	46.9	0.00319
0.7	0.5357	47.	0.00319
0.8	0.5453	47.1	0.
0.9	0.507	47.2	-0.00319
1.	0.4847	47.3	-0.00319
1.1	0.4528	47.4	0.00319
1.2	0.4273	47.5	0.00319
1.3	0.4018	47.6	0.
1.4	0.3667	47.7	0.
1.5	0.338	47.8	0.00319
1.6	0.3157	47.9	0.00319
1.7	0.2934	48.	0.
1.8	0.2742	48.1	0.00638
1.9	0.2455	48.2	0.00638
2.	0.2264	48.3	0.00638
2.1	0.2009	48.4	-0.00319
2.2	0.1817	48.5	-0.00319
2.3	0.1594	48.6	0.00638
2.4	0.1467	48.7	0.
2.5	0.1339	48.8	0.00319
2.6	0.1244	48.9	0.00638
2.7	0.1084	49.	0.00638
2.8	0.09247	49.1	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	0.07971	49.2	0.00638
3.	0.07334	49.3	0.00319
3.1	0.06696	49.4	0.00319
3.2	0.06377	49.5	0.00319
3.3	0.05739	49.6	0.00319
3.4	0.05102	49.7	-0.00319
3.5	0.04783	49.8	0.
3.6	0.04464	49.9	0.00638
3.7	0.03826	50.	0.
3.8	0.04145	50.1	0.
3.9	0.03826	50.2	0.00319
4.	0.03826	50.3	0.
4.1	0.03188	50.4	0.
4.2	0.0287	50.5	0.00319
4.3	0.02232	50.6	0.00319
4.4	0.02551	50.7	0.
4.5	0.02551	50.8	0.00319
4.6	0.01913	50.9	0.
4.7	0.02232	51.	0.00956
4.8	0.02232	51.1	0.
4.9	0.01913	51.2	0.00319
5.	0.01594	51.3	0.00319
5.1	0.01594	51.4	0.00319
5.2	0.01594	51.5	0.
5.3	0.01275	51.6	-0.00319
5.4	0.01913	51.7	0.00319
5.5	0.01275	51.8	0.00319
5.6	0.00956	51.9	-0.00319
5.7	0.00638	52.	0.00638
5.8	0.00638	52.1	0.00638
5.9	0.00956	52.2	0.00319
6.	0.00319	52.3	0.
6.1	0.00956	52.4	0.00638
6.2	0.00319	52.5	0.
6.3	0.00638	52.6	0.00319
6.4	0.00638	52.7	0.00638
6.5	0.00638	52.8	0.00319
6.6	0.	52.9	0.00319
6.7	0.00638	53.	0.00319
6.8	0.	53.1	0.00319
6.9	0.	53.2	0.00319
7.	-0.00319	53.3	0.00956
7.1	0.	53.4	0.00319
7.2	0.	53.5	0.00319
7.3	0.	53.6	0.00319
7.4	0.	53.7	0.00638
7.5	0.00319	53.8	-0.00319
7.6	-0.00319	53.9	0.00319
7.7	0.	54.	0.00638
7.8	0.	54.1	0.
7.9	-0.00319	54.2	0.00319
8.	-0.00638	54.3	0.
8.1	0.00319	54.4	0.00319
8.2	0.	54.5	0.00319
8.3	-0.00638	54.6	0.
8.4	-0.00957	54.7	0.00319
8.5	-0.00319	54.8	0.00638
8.6	-0.00319	54.9	-0.00319
8.7	-0.00638	55.	0.
8.8	0.	55.1	0.
8.9	-0.00319	55.2	0.
9.	-0.00957	55.3	0.
9.1	-0.00638	55.4	0.
9.2	-0.00638	55.5	0.00319
9.3	-0.00957	55.6	0.00319
9.4	0.	55.7	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00638	55.8	0.00638
9.6	-0.00319	55.9	0.00319
9.7	-0.00957	56.	0.
9.8	-0.00638	56.1	0.00638
9.9	-0.00638	56.2	0.00319
10.	-0.00319	56.3	0.00319
10.1	-0.00638	56.4	0.00319
10.2	-0.00638	56.5	0.00319
10.3	-0.00957	56.6	0.00638
10.4	-0.00319	56.7	0.00638
10.5	-0.00638	56.8	0.00319
10.6	-0.00957	56.9	0.
10.7	-0.00957	57.	0.00638
10.8	0.	57.1	0.00956
10.9	-0.00638	57.2	0.00638
11.	-0.00638	57.3	0.00638
11.1	-0.00319	57.4	0.00319
11.2	-0.00319	57.5	0.00638
11.3	-0.00319	57.6	0.00319
11.4	-0.00638	57.7	0.00319
11.5	-0.00638	57.8	0.00319
11.6	-0.00957	57.9	0.00956
11.7	-0.00957	58.	0.00638
11.8	-0.00319	58.1	0.00319
11.9	-0.00957	58.2	0.00319
12.	-0.00957	58.3	0.00319
12.1	-0.00638	58.4	0.00319
12.2	-0.00319	58.5	0.00638
12.3	-0.00638	58.6	0.00319
12.4	-0.00319	58.7	0.00638
12.5	-0.00319	58.8	0.00956
12.6	-0.00957	58.9	0.00638
12.7	-0.00638	59.	0.00319
12.8	-0.00957	59.1	0.00956
12.9	-0.00638	59.2	0.00638
13.	-0.00638	59.3	0.00319
13.1	-0.00638	59.4	0.00956
13.2	-0.00638	59.5	0.00638
13.3	-0.00638	59.6	0.00319
13.4	-0.00957	59.7	0.00956
13.5	-0.00638	59.8	0.00638
13.6	-0.00638	59.9	0.00956
13.7	-0.00319	60.	-0.00319
13.8	-0.00638	60.1	0.
13.9	-0.00319	60.2	0.00638
14.	-0.01276	60.3	0.00956
14.1	-0.00957	60.4	0.00638
14.2	-0.00319	60.5	0.00638
14.3	-0.00957	60.6	0.00638
14.4	-0.00638	60.7	0.00319
14.5	-0.00957	60.8	0.01275
14.6	-0.00638	60.9	0.00638
14.7	-0.00957	61.	0.00319
14.8	-0.01276	61.1	0.00956
14.9	-0.01276	61.2	0.
15.	-0.00638	61.3	0.00319
15.1	-0.00319	61.4	0.00638
15.2	-0.00638	61.5	0.00638
15.3	-0.00319	61.6	0.00638
15.4	-0.00957	61.7	0.
15.5	-0.00638	61.8	0.00638
15.6	-0.00957	61.9	0.00638
15.7	-0.00957	62.	0.00638
15.8	-0.00957	62.1	0.00956
15.9	-0.00957	62.2	0.00319
16.	-0.00957	62.3	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00957	62.4	0.00319
16.2	-0.00638	62.5	0.
16.3	-0.00638	62.6	0.
16.4	-0.00957	62.7	0.00319
16.5	-0.00319	62.8	0.00319
16.6	-0.00957	62.9	0.00638
16.7	-0.00957	63.	0.00638
16.8	-0.00957	63.1	0.00638
16.9	-0.00957	63.2	0.00638
17.	-0.00957	63.3	0.00319
17.1	-0.00319	63.4	0.00319
17.2	-0.00957	63.5	0.
17.3	-0.00957	63.6	0.00319
17.4	-0.00957	63.7	0.00638
17.5	-0.01276	63.8	0.
17.6	-0.00638	63.9	0.00638
17.7	-0.01595	64.	0.00319
17.8	-0.00957	64.1	0.00956
17.9	-0.00638	64.2	0.00319
18.	-0.01276	64.3	0.00956
18.1	-0.00638	64.4	0.
18.2	-0.00638	64.5	0.00638
18.3	-0.00957	64.6	0.00956
18.4	-0.01276	64.7	0.00638
18.5	-0.00957	64.8	0.00319
18.6	-0.00957	64.9	0.00956
18.7	-0.00638	65.	0.00319
18.8	-0.00319	65.1	0.
18.9	-0.00957	65.2	0.00319
19.	-0.00638	65.3	0.
19.1	-0.00319	65.4	0.00638
19.2	-0.00638	65.5	0.00638
19.3	-0.00957	65.6	0.00638
19.4	-0.00638	65.7	0.00319
19.5	-0.00319	65.8	0.01275
19.6	-0.00319	65.9	0.00638
19.7	-0.00957	66.	0.00638
19.8	-0.00957	66.1	0.00319
19.9	-0.00638	66.2	0.
20.	-0.00638	66.3	0.00638
20.1	-0.00957	66.4	0.01275
20.2	-0.00638	66.5	0.00319
20.3	-0.00638	66.6	0.00638
20.4	-0.00638	66.7	0.
20.5	0.	66.8	0.00638
20.6	-0.00638	66.9	0.00319
20.7	-0.00319	67.	0.00638
20.8	-0.01276	67.1	0.
20.9	-0.00638	67.2	0.00638
21.	-0.00638	67.3	0.00956
21.1	-0.00319	67.4	0.00319
21.2	0.	67.5	0.00956
21.3	-0.00638	67.6	0.00319
21.4	-0.00319	67.7	0.00638
21.5	-0.00957	67.8	0.00319
21.6	-0.00957	67.9	0.01275
21.7	-0.01276	68.	0.00638
21.8	-0.00638	68.1	0.00638
21.9	-0.00638	68.2	0.00638
22.	-0.01276	68.3	0.00956
22.1	-0.00319	68.4	0.01275
22.2	-0.00319	68.5	0.00638
22.3	-0.00638	68.6	0.00956
22.4	-0.00638	68.7	0.00956
22.5	-0.00319	68.8	0.00956
22.6	-0.00957	68.9	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.00638	69.	0.00638
22.8	0.	69.1	0.00638
22.9	-0.00957	69.2	0.00319
23.	-0.00957	69.3	0.00956
23.1	-0.00638	69.4	0.00956
23.2	-0.00638	69.5	0.00638
23.3	-0.00957	69.6	0.00638
23.4	-0.00957	69.7	0.01275
23.5	-0.00957	69.8	0.00956
23.6	-0.00638	69.9	0.00956
23.7	-0.00638	70.	0.00319
23.8	-0.00638	70.1	0.00638
23.9	-0.00638	70.2	0.00638
24.	-0.00319	70.3	0.00638
24.1	-0.00638	70.4	0.00956
24.2	-0.00957	70.5	0.00319
24.3	-0.00319	70.6	0.00319
24.4	-0.00957	70.7	0.01275
24.5	-0.01276	70.8	0.00638
24.6	-0.00638	70.9	0.00319
24.7	-0.00638	71.	0.00638
24.8	-0.00319	71.1	0.00956
24.9	-0.00638	71.2	0.00638
25.	-0.00638	71.3	0.
25.1	-0.00319	71.4	0.00638
25.2	-0.00319	71.5	0.00638
25.3	-0.00319	71.6	0.00956
25.4	-0.00638	71.7	0.00319
25.5	-0.00319	71.8	0.00638
25.6	-0.00638	71.9	0.00319
25.7	-0.00638	72.	0.00638
25.8	-0.00638	72.1	0.00638
25.9	-0.00319	72.2	-0.00319
26.	-0.00319	72.3	0.00638
26.1	-0.00638	72.4	0.00956
26.2	-0.00319	72.5	0.00956
26.3	-0.00638	72.6	0.00319
26.4	-0.00319	72.7	0.00638
26.5	0.	72.8	0.00956
26.6	-0.00319	72.9	0.00638
26.7	-0.00319	73.	0.00319
26.8	-0.00319	73.1	0.00638
26.9	-0.00638	73.2	0.00956
27.	-0.00319	73.3	0.00956
27.1	-0.00319	73.4	0.01275
27.2	-0.00319	73.5	0.00638
27.3	-0.00319	73.6	0.00956
27.4	-0.00957	73.7	0.00319
27.5	-0.00638	73.8	0.01594
27.6	-0.00319	73.9	0.00638
27.7	-0.00319	74.	0.00638
27.8	-0.00319	74.1	0.00638
27.9	-0.00319	74.2	0.00956
28.	0.	74.3	0.00638
28.1	-0.00638	74.4	0.01275
28.2	-0.00957	74.5	0.00319
28.3	-0.00319	74.6	0.01275
28.4	-0.00319	74.7	-0.00319
28.5	-0.00638	74.8	0.00638
28.6	-0.00319	74.9	0.00319
28.7	-0.00319	75.	0.00638
28.8	-0.00638	75.1	0.00319
28.9	-0.00319	75.2	0.00956
29.	0.	75.3	0.00956
29.1	-0.00319	75.4	0.00319
29.2	0.	75.5	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	0.	75.6	0.01594
29.4	-0.00319	75.7	0.00319
29.5	-0.00957	75.8	0.00638
29.6	0.	75.9	-0.00319
29.7	-0.00319	76.	0.01275
29.8	0.	76.1	0.01275
29.9	0.	76.2	0.00638
30.	-0.00319	76.3	0.
30.1	0.	76.4	0.01594
30.2	0.	76.5	0.
30.3	-0.00319	76.6	0.00319
30.4	0.	76.7	0.00956
30.5	-0.00319	76.8	0.00638
30.6	-0.00638	76.9	0.
30.7	-0.00319	77.	0.00638
30.8	-0.00638	77.1	0.00956
30.9	-0.00319	77.2	0.00956
31.	0.	77.3	0.00956
31.1	-0.00319	77.4	0.00319
31.2	-0.00319	77.5	0.00319
31.3	-0.00319	77.6	0.00638
31.4	-0.00638	77.7	0.00638
31.5	-0.00319	77.8	0.01594
31.6	-0.00319	77.9	0.
31.7	-0.00638	78.	0.00638
31.8	0.	78.1	0.
31.9	0.	78.2	0.00319
32.	0.	78.3	0.00638
32.1	-0.00319	78.4	0.00319
32.2	-0.00638	78.5	0.00956
32.3	-0.00957	78.6	0.00638
32.4	0.	78.7	0.00956
32.5	-0.00638	78.8	0.00956
32.6	-0.00638	78.9	0.
32.7	-0.00319	79.	0.00638
32.8	0.	79.1	0.00319
32.9	-0.00319	79.2	0.00638
33.	0.	79.3	0.00956
33.1	0.	79.4	0.00638
33.2	-0.00638	79.5	0.00956
33.3	-0.00319	79.6	0.00638
33.4	-0.00319	79.7	0.00638
33.5	-0.00638	79.8	0.00956
33.6	0.	79.9	0.00319
33.7	0.	80.	0.00638
33.8	-0.00319	80.1	0.01275
33.9	0.00319	80.2	0.00638
34.	0.	80.3	0.00956
34.1	-0.00319	80.4	0.00319
34.2	0.00319	80.5	0.01275
34.3	0.	80.6	0.00956
34.4	-0.00319	80.7	0.00319
34.5	-0.00638	80.8	0.00638
34.6	0.	80.9	0.01275
34.7	0.	81.	0.00319
34.8	0.	81.1	0.00956
34.9	0.	81.2	0.00319
35.	-0.00638	81.3	0.00956
35.1	0.	81.4	0.00956
35.2	0.	81.5	0.00638
35.3	-0.00638	81.6	0.01594
35.4	0.	81.7	0.
35.5	-0.00638	81.8	0.00956
35.6	0.	81.9	0.01275
35.7	0.	82.	0.00956
35.8	0.	82.1	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
35.9	-0.00319	82.2	0.00956
36.	0.	82.3	0.01275
36.1	-0.00319	82.4	0.00638
36.2	0.	82.5	0.01594
36.3	0.	82.6	0.00319
36.4	0.	82.7	0.01594
36.5	0.	82.8	0.00638
36.6	-0.00319	82.9	0.00956
36.7	0.	83.	0.01275
36.8	0.	83.1	0.01275
36.9	-0.00319	83.2	0.00638
37.	0.00319	83.3	0.01275
37.1	0.	83.4	0.02232
37.2	0.00319	83.5	0.00956
37.3	-0.00638	83.6	0.00638
37.4	0.	83.7	0.01594
37.5	0.	83.8	0.01275
37.6	0.00319	83.9	0.01594
37.7	-0.00319	84.	0.02232
37.8	0.00319	84.1	0.02551
37.9	0.	84.2	0.03507
38.	-0.00319	84.3	0.04145
38.1	-0.00319	84.4	0.05102
38.2	-0.00319	84.5	0.03826
38.3	0.	84.6	0.04464
38.4	0.	84.7	0.04783
38.5	-0.00319	84.8	0.05739
38.6	-0.00319	84.9	0.05102
38.7	-0.00319	85.	0.04464
38.8	0.	85.1	0.04783
38.9	-0.00319	85.2	0.05102
39.	0.	85.3	0.04783
39.1	-0.00319	85.4	0.05102
39.2	0.00319	85.5	0.04783
39.3	-0.00319	85.6	0.05102
39.4	0.	85.7	0.04783
39.5	0.	85.8	0.04783
39.6	0.00319	85.9	0.04783
39.7	-0.00319	86.	0.04464
39.8	0.	86.1	0.04783
39.9	0.	86.2	0.05421
40.	-0.00319	86.3	0.04783
40.1	0.	86.4	0.04464
40.2	0.00638	86.5	0.05102
40.3	0.	86.6	0.04783
40.4	0.00319	86.7	0.04783
40.5	0.00319	86.8	0.04783
40.6	0.	86.9	0.04783
40.7	0.00319	87.	0.04783
40.8	-0.00319	87.1	0.04783
40.9	-0.00319	87.2	0.04783
41.	0.00319	87.3	0.05102
41.1	0.	87.4	0.05102
41.2	0.	87.5	0.05102
41.3	0.	87.6	0.04464
41.4	0.00638	87.7	0.04783
41.5	0.	87.8	0.05102
41.6	0.00319	87.9	0.04464
41.7	0.	88.	0.04783
41.8	0.	88.1	0.04783
41.9	0.	88.2	0.04783
42.	0.	88.3	0.04783
42.1	0.00319	88.4	0.04783
42.2	0.	88.5	0.04783
42.3	0.00319	88.6	0.05102
42.4	0.	88.7	0.05102

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
42.5	-0.00319	88.8	0.05102
42.6	0.	88.9	0.04783
42.7	-0.00319	89.	0.05102
42.8	0.	89.1	0.04783
42.9	-0.00319	89.2	0.05739
43.	0.00319	89.3	0.05102
43.1	0.	89.4	0.04464
43.2	0.	89.5	0.05102
43.3	-0.00319	89.6	0.04783
43.4	0.00638	89.7	0.04783
43.5	0.00638	89.8	0.05102
43.6	0.	89.9	0.05102
43.7	-0.00319	90.	0.04783
43.8	-0.00638	90.1	0.04464
43.9	-0.00319	90.2	0.05102
44.	-0.00319	90.3	0.05102
44.1	-0.00319	90.4	0.04783
44.2	0.	90.5	0.04783
44.3	-0.00319	90.6	0.04783
44.4	0.	90.7	0.04783
44.5	0.	90.8	0.04783
44.6	0.	90.9	0.05102
44.7	0.	91.	0.04783
44.8	0.00638	91.1	0.04783
44.9	0.	91.2	0.04464
45.	0.	91.3	0.04783
45.1	0.00319	91.4	0.05102
45.2	0.	91.5	0.05102
45.3	0.00638	91.6	0.04464
45.4	0.00319	91.7	0.04783
45.5	0.	91.8	0.04783
45.6	0.	91.9	0.04464
45.7	0.00319	92.	0.04783
45.8	0.00319	92.1	0.05102
45.9	0.	92.2	0.05421
46.	0.	92.3	0.05421
46.1	0.00319	92.4	0.05102
46.2	0.		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Hvorslev
Log Factor: 0.1887

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	2.428	ft/day
y0	0.903	ft

K = 0.0008567 cm/sec
T = K*b = 57.94 ft²/day (0.623 sq. cm/sec)

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	2.428	0.1115	+/- 0.2188	21.77	ft/day
y0	0.903	0.02804	+/- 0.05501	32.2	ft

C.I. is approximate 95% confidence interval for parameter

t-ratio = estimate/std. error
No estimation window

K = 0.0008567 cm/sec
T = K*b = 57.94 ft²/day (0.623 sq. cm/sec)

Parameter Correlations

	K	y0
K	1.00	0.68
y0	0.68	1.00

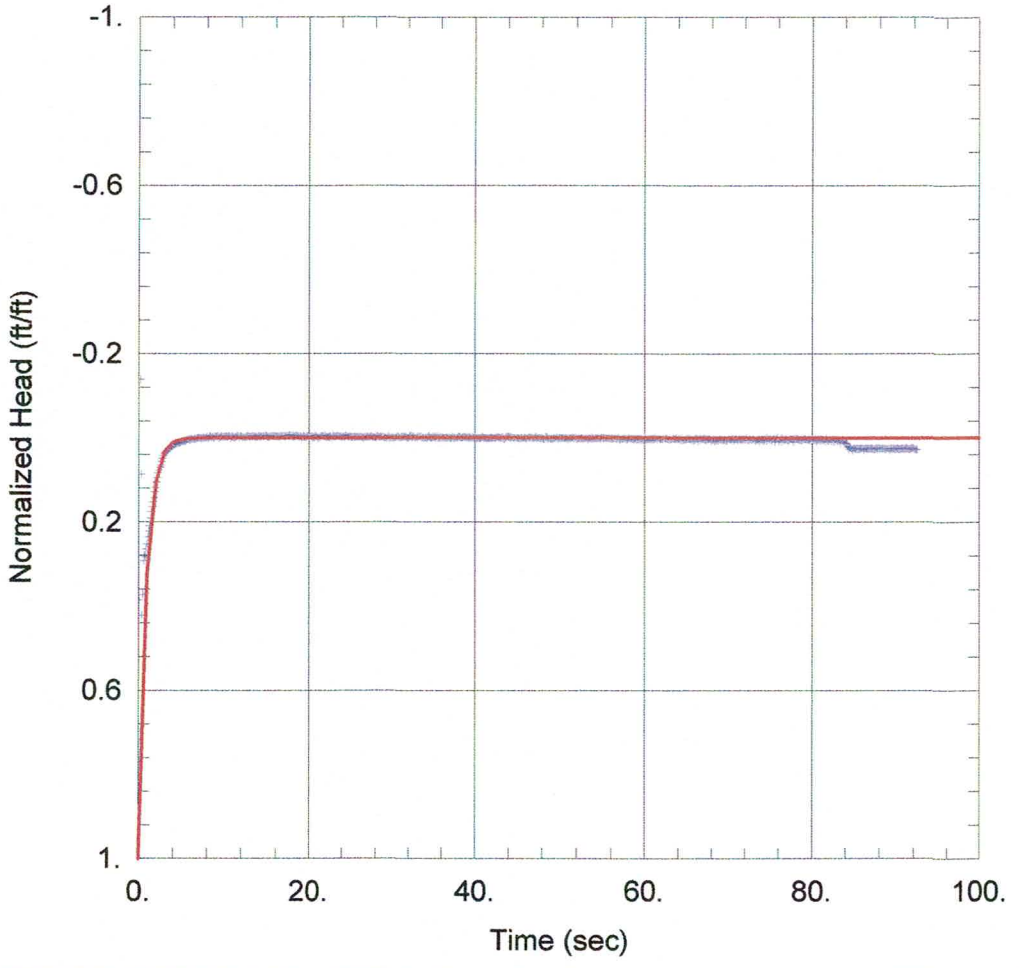
Residual Statistics

for weighted residuals

Sum of Squares	2.762 ft^2
Variance	0.002992 ft^2
Std. Deviation	0.0547 ft
Mean	0.004814 ft
No. of Residuals	925
No. of Estimates	2

NOTES

Well Pressure = 51 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T89_Test4Springer-Gelhar.aqt
Date: 02/14/13 Time: 09:17:18

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T89
Test Date: 02/07/2013

AQUIFER DATA

Saturated Thickness: 23.86 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T89)

Initial Displacement: 1.93 ft
Total Well Penetration Depth: 28.26 ft
Casing Radius: 0.02083 ft
Static Water Column Height: 23.86 ft
Screen Length: 25. ft
Well Radius: 0.0833 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
K = 3.137 ft/day
Le = 0.0631 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:17:36

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/2013
Test Well: T89

AQUIFER DATA

Saturated Thickness: 23.86 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T89

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 1.93 ft
Static Water Column Height: 23.86 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 25. ft
Total Well Penetration Depth: 28.26 ft

No. of Observations: 925

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.929	46.3	0.
0.1	0.743	46.4	-0.00319
0.2	-0.271	46.5	0.
0.3	0.1658	46.6	-0.00319
0.4	0.8131	46.7	0.
0.5	0.7175	46.8	0.
0.6	0.5612	46.9	0.00319
0.7	0.5357	47.	0.00319
0.8	0.5453	47.1	0.
0.9	0.507	47.2	-0.00319
1.	0.4847	47.3	-0.00319
1.1	0.4528	47.4	0.00319
1.2	0.4273	47.5	0.00319
1.3	0.4018	47.6	0.
1.4	0.3667	47.7	0.
1.5	0.338	47.8	0.00319
1.6	0.3157	47.9	0.00319
1.7	0.2934	48.	0.
1.8	0.2742	48.1	0.00638
1.9	0.2455	48.2	0.00638
2.	0.2264	48.3	0.00638
2.1	0.2009	48.4	-0.00319
2.2	0.1817	48.5	-0.00319
2.3	0.1594	48.6	0.00638
2.4	0.1467	48.7	0.
2.5	0.1339	48.8	0.00319
2.6	0.1244	48.9	0.00638
2.7	0.1084	49.	0.00638
2.8	0.09247	49.1	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	0.07971	49.2	0.00638
3.	0.07334	49.3	0.00319
3.1	0.06696	49.4	0.00319
3.2	0.06377	49.5	0.00319
3.3	0.05739	49.6	0.00319
3.4	0.05102	49.7	-0.00319
3.5	0.04783	49.8	0.
3.6	0.04464	49.9	0.00638
3.7	0.03826	50.	0.
3.8	0.04145	50.1	0.
3.9	0.03826	50.2	0.00319
4.	0.03826	50.3	0.
4.1	0.03188	50.4	0.
4.2	0.0287	50.5	0.00319
4.3	0.02232	50.6	0.00319
4.4	0.02551	50.7	0.
4.5	0.02551	50.8	0.00319
4.6	0.01913	50.9	0.
4.7	0.02232	51.	0.00956
4.8	0.02232	51.1	0.
4.9	0.01913	51.2	0.00319
5.	0.01594	51.3	0.00319
5.1	0.01594	51.4	0.00319
5.2	0.01594	51.5	0.
5.3	0.01275	51.6	-0.00319
5.4	0.01913	51.7	0.00319
5.5	0.01275	51.8	0.00319
5.6	0.00956	51.9	-0.00319
5.7	0.00638	52.	0.00638
5.8	0.00638	52.1	0.00638
5.9	0.00956	52.2	0.00319
6.	0.00319	52.3	0.
6.1	0.00956	52.4	0.00638
6.2	0.00319	52.5	0.
6.3	0.00638	52.6	0.00319
6.4	0.00638	52.7	0.00638
6.5	0.00638	52.8	0.00319
6.6	0.	52.9	0.00319
6.7	0.00638	53.	0.00319
6.8	0.	53.1	0.00319
6.9	0.	53.2	0.00319
7.	-0.00319	53.3	0.00956
7.1	0.	53.4	0.00319
7.2	0.	53.5	0.00319
7.3	0.	53.6	0.00319
7.4	0.	53.7	0.00638
7.5	0.00319	53.8	-0.00319
7.6	-0.00319	53.9	0.00319
7.7	0.	54.	0.00638
7.8	0.	54.1	0.
7.9	-0.00319	54.2	0.00319
8.	-0.00638	54.3	0.
8.1	0.00319	54.4	0.00319
8.2	0.	54.5	0.00319
8.3	-0.00638	54.6	0.
8.4	-0.00957	54.7	0.00319
8.5	-0.00319	54.8	0.00638
8.6	-0.00319	54.9	-0.00319
8.7	-0.00638	55.	0.
8.8	0.	55.1	0.
8.9	-0.00319	55.2	0.
9.	-0.00957	55.3	0.
9.1	-0.00638	55.4	0.
9.2	-0.00638	55.5	0.00319
9.3	-0.00957	55.6	0.00319
9.4	0.	55.7	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00638	55.8	0.00638
9.6	-0.00319	55.9	0.00319
9.7	-0.00957	56.	0.
9.8	-0.00638	56.1	0.00638
9.9	-0.00638	56.2	0.00319
10.	-0.00319	56.3	0.00319
10.1	-0.00638	56.4	0.00319
10.2	-0.00638	56.5	0.00319
10.3	-0.00957	56.6	0.00638
10.4	-0.00319	56.7	0.00638
10.5	-0.00638	56.8	0.00319
10.6	-0.00957	56.9	0.
10.7	-0.00957	57.	0.00638
10.8	0.	57.1	0.00956
10.9	-0.00638	57.2	0.00638
11.	-0.00638	57.3	0.00638
11.1	-0.00319	57.4	0.00319
11.2	-0.00319	57.5	0.00638
11.3	-0.00319	57.6	0.00319
11.4	-0.00638	57.7	0.00319
11.5	-0.00638	57.8	0.00319
11.6	-0.00957	57.9	0.00956
11.7	-0.00957	58.	0.00638
11.8	-0.00319	58.1	0.00319
11.9	-0.00957	58.2	0.00319
12.	-0.00957	58.3	0.00319
12.1	-0.00638	58.4	0.00319
12.2	-0.00319	58.5	0.00638
12.3	-0.00638	58.6	0.00319
12.4	-0.00319	58.7	0.00638
12.5	-0.00319	58.8	0.00956
12.6	-0.00957	58.9	0.00638
12.7	-0.00638	59.	0.00319
12.8	-0.00957	59.1	0.00956
12.9	-0.00638	59.2	0.00638
13.	-0.00638	59.3	0.00319
13.1	-0.00638	59.4	0.00956
13.2	-0.00638	59.5	0.00638
13.3	-0.00638	59.6	0.00319
13.4	-0.00957	59.7	0.00956
13.5	-0.00638	59.8	0.00638
13.6	-0.00638	59.9	0.00956
13.7	-0.00319	60.	-0.00319
13.8	-0.00638	60.1	0.
13.9	-0.00319	60.2	0.00638
14.	-0.01276	60.3	0.00956
14.1	-0.00957	60.4	0.00638
14.2	-0.00319	60.5	0.00638
14.3	-0.00957	60.6	0.00638
14.4	-0.00638	60.7	0.00319
14.5	-0.00957	60.8	0.01275
14.6	-0.00638	60.9	0.00638
14.7	-0.00957	61.	0.00319
14.8	-0.01276	61.1	0.00956
14.9	-0.01276	61.2	0.
15.	-0.00638	61.3	0.00319
15.1	-0.00319	61.4	0.00638
15.2	-0.00638	61.5	0.00638
15.3	-0.00319	61.6	0.00638
15.4	-0.00957	61.7	0.
15.5	-0.00638	61.8	0.00638
15.6	-0.00957	61.9	0.00638
15.7	-0.00957	62.	0.00638
15.8	-0.00957	62.1	0.00956
15.9	-0.00957	62.2	0.00319
16.	-0.00957	62.3	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00957	62.4	0.00319
16.2	-0.00638	62.5	0.
16.3	-0.00638	62.6	0.
16.4	-0.00957	62.7	0.00319
16.5	-0.00319	62.8	0.00319
16.6	-0.00957	62.9	0.00638
16.7	-0.00957	63.	0.00638
16.8	-0.00957	63.1	0.00638
16.9	-0.00957	63.2	0.00638
17.	-0.00957	63.3	0.00319
17.1	-0.00319	63.4	0.00319
17.2	-0.00957	63.5	0.
17.3	-0.00957	63.6	0.00319
17.4	-0.00957	63.7	0.00638
17.5	-0.01276	63.8	0.
17.6	-0.00638	63.9	0.00638
17.7	-0.01595	64.	0.00319
17.8	-0.00957	64.1	0.00956
17.9	-0.00638	64.2	0.00319
18.	-0.01276	64.3	0.00956
18.1	-0.00638	64.4	0.
18.2	-0.00638	64.5	0.00638
18.3	-0.00957	64.6	0.00956
18.4	-0.01276	64.7	0.00638
18.5	-0.00957	64.8	0.00319
18.6	-0.00957	64.9	0.00956
18.7	-0.00638	65.	0.00319
18.8	-0.00319	65.1	0.
18.9	-0.00957	65.2	0.00319
19.	-0.00638	65.3	0.
19.1	-0.00319	65.4	0.00638
19.2	-0.00638	65.5	0.00638
19.3	-0.00957	65.6	0.00638
19.4	-0.00638	65.7	0.00319
19.5	-0.00319	65.8	0.01275
19.6	-0.00319	65.9	0.00638
19.7	-0.00957	66.	0.00638
19.8	-0.00957	66.1	0.00319
19.9	-0.00638	66.2	0.
20.	-0.00638	66.3	0.00638
20.1	-0.00957	66.4	0.01275
20.2	-0.00638	66.5	0.00319
20.3	-0.00638	66.6	0.00638
20.4	-0.00638	66.7	0.
20.5	0.	66.8	0.00638
20.6	-0.00638	66.9	0.00319
20.7	-0.00319	67.	0.00638
20.8	-0.01276	67.1	0.
20.9	-0.00638	67.2	0.00638
21.	-0.00638	67.3	0.00956
21.1	-0.00319	67.4	0.00319
21.2	0.	67.5	0.00956
21.3	-0.00638	67.6	0.00319
21.4	-0.00319	67.7	0.00638
21.5	-0.00957	67.8	0.00319
21.6	-0.00957	67.9	0.01275
21.7	-0.01276	68.	0.00638
21.8	-0.00638	68.1	0.00638
21.9	-0.00638	68.2	0.00638
22.	-0.01276	68.3	0.00956
22.1	-0.00319	68.4	0.01275
22.2	-0.00319	68.5	0.00638
22.3	-0.00638	68.6	0.00956
22.4	-0.00638	68.7	0.00956
22.5	-0.00319	68.8	0.00956
22.6	-0.00957	68.9	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.00638	69.	0.00638
22.8	0.	69.1	0.00638
22.9	-0.00957	69.2	0.00319
23.	-0.00957	69.3	0.00956
23.1	-0.00638	69.4	0.00956
23.2	-0.00638	69.5	0.00638
23.3	-0.00957	69.6	0.00638
23.4	-0.00957	69.7	0.01275
23.5	-0.00957	69.8	0.00956
23.6	-0.00638	69.9	0.00956
23.7	-0.00638	70.	0.00319
23.8	-0.00638	70.1	0.00638
23.9	-0.00638	70.2	0.00638
24.	-0.00319	70.3	0.00638
24.1	-0.00638	70.4	0.00956
24.2	-0.00957	70.5	0.00319
24.3	-0.00319	70.6	0.00319
24.4	-0.00957	70.7	0.01275
24.5	-0.01276	70.8	0.00638
24.6	-0.00638	70.9	0.00319
24.7	-0.00638	71.	0.00638
24.8	-0.00319	71.1	0.00956
24.9	-0.00638	71.2	0.00638
25.	-0.00638	71.3	0.
25.1	-0.00319	71.4	0.00638
25.2	-0.00319	71.5	0.00638
25.3	-0.00319	71.6	0.00956
25.4	-0.00638	71.7	0.00319
25.5	-0.00319	71.8	0.00638
25.6	-0.00638	71.9	0.00319
25.7	-0.00638	72.	0.00638
25.8	-0.00638	72.1	0.00638
25.9	-0.00319	72.2	-0.00319
26.	-0.00319	72.3	0.00638
26.1	-0.00638	72.4	0.00956
26.2	-0.00319	72.5	0.00956
26.3	-0.00638	72.6	0.00319
26.4	-0.00319	72.7	0.00638
26.5	0.	72.8	0.00956
26.6	-0.00319	72.9	0.00638
26.7	-0.00319	73.	0.00319
26.8	-0.00319	73.1	0.00638
26.9	-0.00638	73.2	0.00956
27.	-0.00319	73.3	0.00956
27.1	-0.00319	73.4	0.01275
27.2	-0.00319	73.5	0.00638
27.3	-0.00319	73.6	0.00956
27.4	-0.00957	73.7	0.00319
27.5	-0.00638	73.8	0.01594
27.6	-0.00319	73.9	0.00638
27.7	-0.00319	74.	0.00638
27.8	-0.00319	74.1	0.00638
27.9	-0.00319	74.2	0.00956
28.	0.	74.3	0.00638
28.1	-0.00638	74.4	0.01275
28.2	-0.00957	74.5	0.00319
28.3	-0.00319	74.6	0.01275
28.4	-0.00319	74.7	-0.00319
28.5	-0.00638	74.8	0.00638
28.6	-0.00319	74.9	0.00319
28.7	-0.00319	75.	0.00638
28.8	-0.00638	75.1	0.00319
28.9	-0.00319	75.2	0.00956
29.	0.	75.3	0.00956
29.1	-0.00319	75.4	0.00319
29.2	0.	75.5	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	0.	75.6	0.01594
29.4	-0.00319	75.7	0.00319
29.5	-0.00957	75.8	0.00638
29.6	0.	75.9	-0.00319
29.7	-0.00319	76.	0.01275
29.8	0.	76.1	0.01275
29.9	0.	76.2	0.00638
30.	-0.00319	76.3	0.
30.1	0.	76.4	0.01594
30.2	0.	76.5	0.
30.3	-0.00319	76.6	0.00319
30.4	0.	76.7	0.00956
30.5	-0.00319	76.8	0.00638
30.6	-0.00638	76.9	0.
30.7	-0.00319	77.	0.00638
30.8	-0.00638	77.1	0.00956
30.9	-0.00319	77.2	0.00956
31.	0.	77.3	0.00956
31.1	-0.00319	77.4	0.00319
31.2	-0.00319	77.5	0.00319
31.3	-0.00319	77.6	0.00638
31.4	-0.00638	77.7	0.00638
31.5	-0.00319	77.8	0.01594
31.6	-0.00319	77.9	0.
31.7	-0.00638	78.	0.00638
31.8	0.	78.1	0.
31.9	0.	78.2	0.00319
32.	0.	78.3	0.00638
32.1	-0.00319	78.4	0.00319
32.2	-0.00638	78.5	0.00956
32.3	-0.00957	78.6	0.00638
32.4	0.	78.7	0.00956
32.5	-0.00638	78.8	0.00956
32.6	-0.00638	78.9	0.
32.7	-0.00319	79.	0.00638
32.8	0.	79.1	0.00319
32.9	-0.00319	79.2	0.00638
33.	0.	79.3	0.00956
33.1	0.	79.4	0.00638
33.2	-0.00638	79.5	0.00956
33.3	-0.00319	79.6	0.00638
33.4	-0.00319	79.7	0.00638
33.5	-0.00638	79.8	0.00956
33.6	0.	79.9	0.00319
33.7	0.	80.	0.00638
33.8	-0.00319	80.1	0.01275
33.9	0.00319	80.2	0.00638
34.	0.	80.3	0.00956
34.1	-0.00319	80.4	0.00319
34.2	0.00319	80.5	0.01275
34.3	0.	80.6	0.00956
34.4	-0.00319	80.7	0.00319
34.5	-0.00638	80.8	0.00638
34.6	0.	80.9	0.01275
34.7	0.	81.	0.00319
34.8	0.	81.1	0.00956
34.9	0.	81.2	0.00319
35.	-0.00638	81.3	0.00956
35.1	0.	81.4	0.00956
35.2	0.	81.5	0.00638
35.3	-0.00638	81.6	0.01594
35.4	0.	81.7	0.
35.5	-0.00638	81.8	0.00956
35.6	0.	81.9	0.01275
35.7	0.	82.	0.00956
35.8	0.	82.1	0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
35.9	-0.00319	82.2	0.00956
36.	0.	82.3	0.01275
36.1	-0.00319	82.4	0.00638
36.2	0.	82.5	0.01594
36.3	0.	82.6	0.00319
36.4	0.	82.7	0.01594
36.5	0.	82.8	0.00638
36.6	-0.00319	82.9	0.00956
36.7	0.	83.	0.01275
36.8	0.	83.1	0.01275
36.9	-0.00319	83.2	0.00638
37.	0.00319	83.3	0.01275
37.1	0.	83.4	0.02232
37.2	0.00319	83.5	0.00956
37.3	-0.00638	83.6	0.00638
37.4	0.	83.7	0.01594
37.5	0.	83.8	0.01275
37.6	0.00319	83.9	0.01594
37.7	-0.00319	84.	0.02232
37.8	0.00319	84.1	0.02551
37.9	0.	84.2	0.03507
38.	-0.00319	84.3	0.04145
38.1	-0.00319	84.4	0.05102
38.2	-0.00319	84.5	0.03826
38.3	0.	84.6	0.04464
38.4	0.	84.7	0.04783
38.5	-0.00319	84.8	0.05739
38.6	-0.00319	84.9	0.05102
38.7	-0.00319	85.	0.04464
38.8	0.	85.1	0.04783
38.9	-0.00319	85.2	0.05102
39.	0.	85.3	0.04783
39.1	-0.00319	85.4	0.05102
39.2	0.00319	85.5	0.04783
39.3	-0.00319	85.6	0.05102
39.4	0.	85.7	0.04783
39.5	0.	85.8	0.04783
39.6	0.00319	85.9	0.04783
39.7	-0.00319	86.	0.04464
39.8	0.	86.1	0.04783
39.9	0.	86.2	0.05421
40.	-0.00319	86.3	0.04783
40.1	0.	86.4	0.04464
40.2	0.00638	86.5	0.05102
40.3	0.	86.6	0.04783
40.4	0.00319	86.7	0.04783
40.5	0.00319	86.8	0.04783
40.6	0.	86.9	0.04783
40.7	0.00319	87.	0.04783
40.8	-0.00319	87.1	0.04783
40.9	-0.00319	87.2	0.04783
41.	0.00319	87.3	0.05102
41.1	0.	87.4	0.05102
41.2	0.	87.5	0.05102
41.3	0.	87.6	0.04464
41.4	0.00638	87.7	0.04783
41.5	0.	87.8	0.05102
41.6	0.00319	87.9	0.04464
41.7	0.	88.	0.04783
41.8	0.	88.1	0.04783
41.9	0.	88.2	0.04783
42.	0.	88.3	0.04783
42.1	0.00319	88.4	0.04783
42.2	0.	88.5	0.04783
42.3	0.00319	88.6	0.05102
42.4	0.	88.7	0.05102

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
42.5	-0.00319	88.8	0.05102
42.6	0.	88.9	0.04783
42.7	-0.00319	89.	0.05102
42.8	0.	89.1	0.04783
42.9	-0.00319	89.2	0.05739
43.	0.00319	89.3	0.05102
43.1	0.	89.4	0.04464
43.2	0.	89.5	0.05102
43.3	-0.00319	89.6	0.04783
43.4	0.00638	89.7	0.04783
43.5	0.00638	89.8	0.05102
43.6	0.	89.9	0.05102
43.7	-0.00319	90.	0.04783
43.8	-0.00638	90.1	0.04464
43.9	-0.00319	90.2	0.05102
44.	-0.00319	90.3	0.05102
44.1	-0.00319	90.4	0.04783
44.2	0.	90.5	0.04783
44.3	-0.00319	90.6	0.04783
44.4	0.	90.7	0.04783
44.5	0.	90.8	0.04783
44.6	0.	90.9	0.05102
44.7	0.	91.	0.04783
44.8	0.00638	91.1	0.04783
44.9	0.	91.2	0.04464
45.	0.	91.3	0.04783
45.1	0.00319	91.4	0.05102
45.2	0.	91.5	0.05102
45.3	0.00638	91.6	0.04464
45.4	0.00319	91.7	0.04783
45.5	0.	91.8	0.04783
45.6	0.	91.9	0.04464
45.7	0.00319	92.	0.04783
45.8	0.00319	92.1	0.05102
45.9	0.	92.2	0.05421
46.	0.	92.3	0.05421
46.1	0.00319	92.4	0.05102
46.2	0.		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 4.584

VISUAL ESTIMATION RESULTS

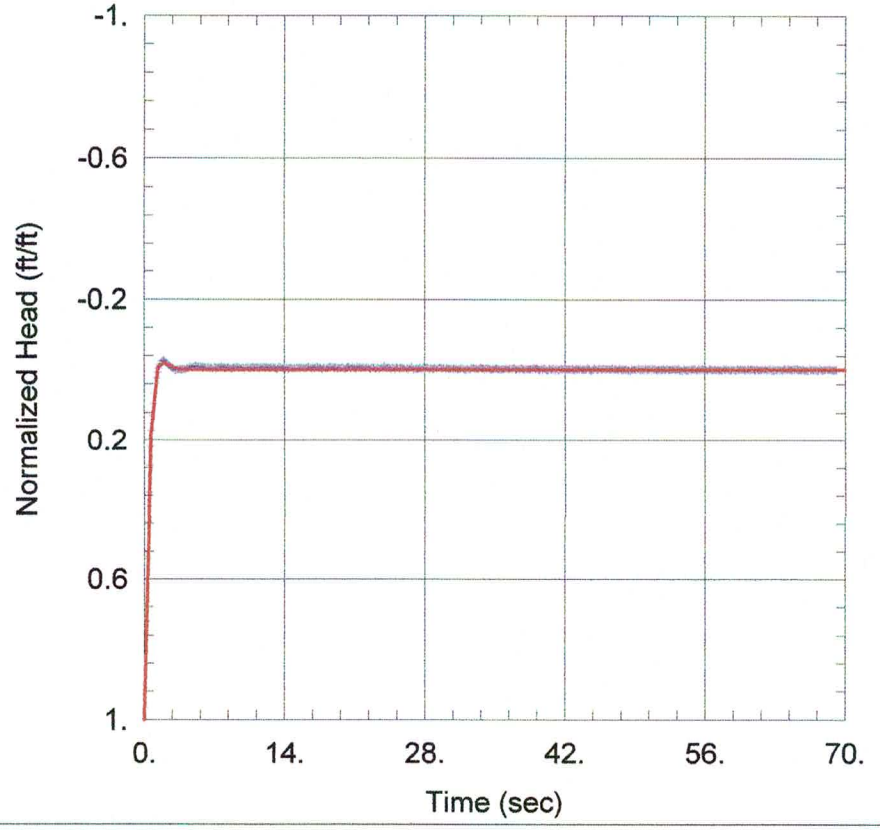
Estimated Parameters

Parameter	Estimate	
K	3.137	ft/day
Le	0.0631	ft

K = 0.001107 cm/sec
T = K*b = 74.84 ft²/day (0.8047 sq. cm/sec)
Le = 0.0631 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 51 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\T91_Test2Springer-Gelhar.aqt
Date: 02/12/13 Time: 14:46:17

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: T91
Test Date: 02/07/2013

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 78.36 ft/day
Le = 0.4861 ft

AQUIFER DATA

Saturated Thickness: 20.39 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (T91)

Initial Displacement: 3.03 ft
Total Well Penetration Depth: 24.28 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 20.39 ft
Screen Length: 20. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 09:19:32

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/2013
Test Well: T91

AQUIFER DATA

Saturated Thickness: 20.39 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: T91

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 3.03 ft
Static Water Column Height: 20.39 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 20. ft
Total Well Penetration Depth: 24.28 ft

No. of Observations: 693

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	3.029	34.7	0.
0.1	2.927	34.8	-0.00319
0.2	2.181	34.9	-0.00956
0.3	1.642	35.	-0.00638
0.4	1.314	35.1	-0.01275
0.5	1.059	35.2	-0.00956
0.6	0.8259	35.3	-0.00638
0.7	0.6569	35.4	-0.00638
0.8	0.5166	35.5	-0.00638
0.9	0.389	35.6	-0.00319
1.	0.287	35.7	-0.00638
1.1	0.2009	35.8	-0.00638
1.2	0.1148	35.9	-0.00638
1.3	0.07015	36.	-0.00638
1.4	0.02232	36.1	-0.00956
1.5	-0.01275	36.2	-0.00956
1.6	-0.04145	36.3	-0.00638
1.7	-0.05421	36.4	-0.00319
1.8	-0.07334	36.5	-0.00956
1.9	-0.07653	36.6	-0.00638
2.	-0.0829	36.7	-0.00638
2.1	-0.07015	36.8	-0.00638
2.2	-0.06058	36.9	-0.00956
2.3	-0.06058	37.	-0.01275
2.4	-0.04783	37.1	-0.00319
2.5	-0.03507	37.2	-0.00638
2.6	-0.03189	37.3	-0.00638
2.7	-0.02232	37.4	-0.00638
2.8	-0.01275	37.5	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.01594	37.6	-0.00638
3.	-0.00638	37.7	-0.01275
3.1	0.	37.8	-0.00638
3.2	0.00638	37.9	-0.00638
3.3	0.	38.	0.
3.4	-0.00319	38.1	-0.00319
3.5	-0.00319	38.2	-0.00638
3.6	-0.00319	38.3	-0.00638
3.7	-0.00319	38.4	-0.00638
3.8	0.	38.5	-0.00319
3.9	-0.00319	38.6	-0.00638
4.	0.	38.7	-0.00956
4.1	-0.00319	38.8	-0.00319
4.2	-0.00319	38.9	-0.01913
4.3	-0.01275	39.	-0.01275
4.4	-0.00956	39.1	-0.00638
4.5	-0.00956	39.2	-0.00956
4.6	-0.02551	39.3	-0.01275
4.7	-0.02232	39.4	-0.00319
4.8	-0.01913	39.5	0.00319
4.9	-0.02232	39.6	-0.00319
5.	-0.0287	39.7	-0.01275
5.1	-0.0287	39.8	0.00638
5.2	-0.03189	39.9	-0.00956
5.3	-0.02551	40.	-0.00956
5.4	-0.02232	40.1	-0.00638
5.5	-0.0287	40.2	-0.00319
5.6	-0.0287	40.3	0.00638
5.7	-0.02551	40.4	-0.00319
5.8	-0.02232	40.5	-0.01275
5.9	-0.01913	40.6	-0.00319
6.	-0.01913	40.7	0.
6.1	-0.01913	40.8	-0.00638
6.2	-0.01594	40.9	-0.00956
6.3	-0.01913	41.	-0.00319
6.4	-0.01594	41.1	0.00319
6.5	-0.01913	41.2	-0.01275
6.6	-0.01275	41.3	-0.00638
6.7	-0.00956	41.4	0.
6.8	-0.01275	41.5	-0.00319
6.9	-0.00638	41.6	-0.00638
7.	-0.01913	41.7	-0.01275
7.1	-0.01913	41.8	-0.00319
7.2	-0.00956	41.9	-0.00638
7.3	-0.01594	42.	-0.00638
7.4	-0.01913	42.1	-0.00638
7.5	-0.01594	42.2	-0.00319
7.6	-0.01913	42.3	-0.00319
7.7	-0.01913	42.4	-0.00319
7.8	-0.0287	42.5	-0.00638
7.9	-0.01594	42.6	-0.00319
8.	-0.02232	42.7	-0.00319
8.1	-0.01594	42.8	-0.00956
8.2	-0.01275	42.9	0.
8.3	-0.01594	43.	0.
8.4	-0.01913	43.1	-0.00319
8.5	-0.01913	43.2	-0.00638
8.6	-0.01594	43.3	-0.00319
8.7	-0.01275	43.4	-0.00956
8.8	-0.00638	43.5	0.
8.9	-0.01275	43.6	-0.01275
9.	-0.01913	43.7	0.00319
9.1	-0.01913	43.8	-0.00319
9.2	-0.01275	43.9	0.
9.3	-0.02232	44.	0.
9.4	-0.02551	44.1	-0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.01275	44.2	-0.00319
9.6	-0.01594	44.3	-0.01594
9.7	-0.01275	44.4	-0.00956
9.8	-0.01594	44.5	-0.00319
9.9	-0.01913	44.6	0.00957
10.	-0.01594	44.7	0.00319
10.1	-0.00319	44.8	-0.00319
10.2	-0.01594	44.9	-0.00319
10.3	-0.01594	45.	-0.01275
10.4	-0.01913	45.1	-0.00638
10.5	-0.01594	45.2	-0.00319
10.6	-0.00956	45.3	0.
10.7	-0.01275	45.4	-0.00956
10.8	-0.01594	45.5	-0.00956
10.9	-0.02232	45.6	-0.00638
11.	-0.01594	45.7	0.
11.1	-0.01275	45.8	-0.00638
11.2	-0.02232	45.9	-0.00956
11.3	-0.01913	46.	-0.00638
11.4	-0.01275	46.1	-0.00638
11.5	-0.01913	46.2	-0.00638
11.6	-0.00956	46.3	-0.00638
11.7	-0.02232	46.4	-0.00638
11.8	-0.01913	46.5	-0.00638
11.9	-0.01594	46.6	-0.00319
12.	-0.02551	46.7	-0.00638
12.1	-0.01275	46.8	-0.01275
12.2	-0.02232	46.9	-0.00319
12.3	-0.01913	47.	-0.00319
12.4	-0.01275	47.1	-0.00638
12.5	-0.01913	47.2	-0.00638
12.6	-0.01594	47.3	0.
12.7	-0.01275	47.4	0.
12.8	-0.02232	47.5	-0.00956
12.9	-0.01913	47.6	-0.00638
13.	-0.01913	47.7	0.
13.1	-0.00956	47.8	-0.00319
13.2	-0.01275	47.9	0.
13.3	-0.00638	48.	-0.00638
13.4	-0.01275	48.1	0.
13.5	-0.02232	48.2	-0.00956
13.6	-0.01913	48.3	0.00638
13.7	-0.01913	48.4	0.00319
13.8	-0.01594	48.5	0.
13.9	-0.00956	48.6	0.00957
14.	-0.01913	48.7	-0.00956
14.1	-0.01275	48.8	0.
14.2	-0.00956	48.9	-0.00319
14.3	-0.02232	49.	-0.00638
14.4	-0.00319	49.1	-0.00319
14.5	-0.00956	49.2	-0.00319
14.6	-0.01594	49.3	-0.00319
14.7	-0.01275	49.4	-0.00956
14.8	-0.00956	49.5	-0.00638
14.9	-0.00956	49.6	0.
15.	-0.00956	49.7	-0.00638
15.1	-0.01275	49.8	0.
15.2	-0.00956	49.9	-0.00319
15.3	-0.01594	50.	0.
15.4	-0.01275	50.1	-0.00956
15.5	-0.01275	50.2	-0.00319
15.6	-0.01275	50.3	-0.00319
15.7	-0.01275	50.4	-0.00638
15.8	-0.01594	50.5	-0.00319
15.9	-0.01913	50.6	-0.00956
16.	-0.00956	50.7	0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.01275	50.8	-0.01594
16.2	-0.01275	50.9	-0.00319
16.3	-0.01275	51.	-0.00638
16.4	-0.01913	51.1	-0.00638
16.5	-0.01913	51.2	0.00319
16.6	-0.01594	51.3	0.
16.7	-0.00956	51.4	-0.00319
16.8	-0.00638	51.5	-0.00319
16.9	-0.02232	51.6	0.
17.	-0.00956	51.7	0.
17.1	-0.01275	51.8	-0.00319
17.2	-0.01594	51.9	-0.00956
17.3	-0.01913	52.	0.
17.4	-0.02232	52.1	-0.00319
17.5	-0.00956	52.2	-0.00638
17.6	-0.01913	52.3	-0.01275
17.7	-0.00956	52.4	0.00319
17.8	-0.00319	52.5	-0.00319
17.9	-0.00956	52.6	-0.00319
18.	-0.01594	52.7	0.
18.1	-0.01594	52.8	-0.00638
18.2	-0.00956	52.9	-0.00638
18.3	-0.01275	53.	-0.00319
18.4	-0.00956	53.1	-0.00319
18.5	-0.02232	53.2	-0.00638
18.6	-0.02232	53.3	-0.00319
18.7	-0.01913	53.4	-0.00956
18.8	-0.01913	53.5	0.
18.9	-0.01913	53.6	0.00319
19.	-0.00956	53.7	-0.00319
19.1	-0.01594	53.8	0.00638
19.2	-0.01913	53.9	-0.00956
19.3	-0.00638	54.	-0.00319
19.4	-0.01275	54.1	0.
19.5	-0.01275	54.2	0.
19.6	-0.00956	54.3	-0.00319
19.7	-0.00956	54.4	0.00638
19.8	-0.01594	54.5	-0.00638
19.9	-0.01275	54.6	0.
20.	-0.00956	54.7	-0.00638
20.1	-0.00638	54.8	-0.00319
20.2	-0.00956	54.9	-0.00638
20.3	-0.01594	55.	-0.00638
20.4	-0.01913	55.1	-0.00638
20.5	-0.02551	55.2	0.00638
20.6	-0.00956	55.3	0.
20.7	-0.00956	55.4	-0.00956
20.8	-0.02232	55.5	0.
20.9	-0.01275	55.6	-0.00319
21.	-0.01275	55.7	-0.00638
21.1	-0.01594	55.8	-0.00956
21.2	-0.00638	55.9	-0.00638
21.3	-0.01913	56.	0.
21.4	-0.02232	56.1	-0.00638
21.5	-0.01594	56.2	0.
21.6	-0.01913	56.3	0.00319
21.7	-0.00956	56.4	-0.00638
21.8	-0.01275	56.5	-0.00638
21.9	-0.01913	56.6	-0.00956
22.	-0.01594	56.7	-0.00319
22.1	-0.01275	56.8	0.00319
22.2	-0.01594	56.9	0.
22.3	-0.01275	57.	-0.00638
22.4	-0.01913	57.1	-0.00319
22.5	-0.01275	57.2	0.00319
22.6	-0.00638	57.3	-0.00956

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.01275	57.4	0.00319
22.8	-0.01275	57.5	0.
22.9	-0.01594	57.6	0.
23.	-0.01594	57.7	0.00638
23.1	-0.00956	57.8	-0.00319
23.2	-0.00319	57.9	-0.00956
23.3	-0.01275	58.	0.
23.4	-0.01594	58.1	0.
23.5	-0.00638	58.2	-0.00956
23.6	-0.00638	58.3	-0.00319
23.7	-0.01594	58.4	-0.00319
23.8	-0.01594	58.5	0.00319
23.9	-0.00956	58.6	0.
24.	-0.0287	58.7	0.
24.1	-0.01275	58.8	-0.00638
24.2	-0.01275	58.9	-0.00319
24.3	-0.00956	59.	0.00319
24.4	-0.01913	59.1	0.00638
24.5	-0.01275	59.2	0.00319
24.6	-0.00956	59.3	-0.00956
24.7	-0.00319	59.4	0.
24.8	-0.00956	59.5	-0.00319
24.9	-0.01594	59.6	-0.00319
25.	-0.01275	59.7	-0.00638
25.1	-0.00638	59.8	-0.00319
25.2	-0.01275	59.9	-0.00319
25.3	-0.01594	60.	0.
25.4	-0.01275	60.1	0.00319
25.5	-0.00956	60.2	0.00319
25.6	-0.00956	60.3	-0.00319
25.7	-0.01275	60.4	-0.00638
25.8	-0.01275	60.5	0.
25.9	-0.00956	60.6	-0.00638
26.	-0.00956	60.7	-0.00319
26.1	-0.00956	60.8	-0.00638
26.2	-0.00638	60.9	0.
26.3	-0.00956	61.	0.
26.4	0.	61.1	0.00319
26.5	-0.00956	61.2	-0.00956
26.6	-0.00956	61.3	0.00319
26.7	-0.01594	61.4	0.00319
26.8	-0.01913	61.5	0.
26.9	0.	61.6	0.00319
27.	-0.00638	61.7	-0.00638
27.1	-0.00638	61.8	-0.00638
27.2	-0.00638	61.9	0.00319
27.3	-0.00956	62.	-0.00319
27.4	-0.00638	62.1	-0.00638
27.5	-0.00956	62.2	0.00319
27.6	-0.01275	62.3	-0.00319
27.7	-0.00638	62.4	-0.00319
27.8	-0.00638	62.5	-0.00638
27.9	-0.01913	62.6	-0.00956
28.	0.	62.7	0.00957
28.1	-0.00956	62.8	-0.00319
28.2	-0.00956	62.9	0.00319
28.3	-0.01275	63.	0.
28.4	-0.00956	63.1	0.
28.5	0.	63.2	0.
28.6	-0.00956	63.3	0.00638
28.7	-0.00956	63.4	-0.00319
28.8	-0.00638	63.5	0.00319
28.9	-0.00319	63.6	0.
29.	-0.00956	63.7	0.
29.1	-0.01275	63.8	0.00638
29.2	-0.00638	63.9	0.

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
29.3	-0.00638	64.	-0.00956
29.4	-0.00956	64.1	-0.00319
29.5	-0.01594	64.2	0.
29.6	-0.01594	64.3	0.
29.7	-0.01275	64.4	-0.00956
29.8	-0.00638	64.5	0.
29.9	-0.00956	64.6	-0.00319
30.	-0.01275	64.7	0.
30.1	-0.00638	64.8	0.
30.2	-0.00956	64.9	-0.00956
30.3	-0.01275	65.	0.
30.4	-0.00638	65.1	-0.00956
30.5	-0.00956	65.2	-0.00319
30.6	-0.00638	65.3	-0.00319
30.7	-0.00956	65.4	0.
30.8	-0.00638	65.5	0.
30.9	-0.00638	65.6	0.
31.	-0.01594	65.7	0.
31.1	-0.00638	65.8	-0.00319
31.2	-0.01594	65.9	0.
31.3	0.	66.	0.00638
31.4	-0.00319	66.1	0.
31.5	-0.00638	66.2	0.00319
31.6	-0.00638	66.3	-0.00319
31.7	-0.00956	66.4	0.00319
31.8	-0.01275	66.5	-0.01594
31.9	-0.00319	66.6	0.00319
32.	0.	66.7	-0.00319
32.1	0.	66.8	0.
32.2	-0.00319	66.9	0.
32.3	-0.00956	67.	-0.00319
32.4	-0.00319	67.1	-0.00319
32.5	-0.00319	67.2	0.
32.6	-0.00638	67.3	0.00638
32.7	-0.01275	67.4	0.00638
32.8	-0.01275	67.5	-0.00956
32.9	-0.01275	67.6	-0.00319
33.	-0.00956	67.7	0.
33.1	-0.00319	67.8	0.00638
33.2	-0.01275	67.9	0.00319
33.3	-0.00319	68.	0.
33.4	-0.00319	68.1	-0.00638
33.5	-0.01275	68.2	0.
33.6	-0.01594	68.3	-0.00638
33.7	-0.00956	68.4	0.00319
33.8	-0.01275	68.5	-0.00638
33.9	-0.01275	68.6	-0.00319
34.	0.	68.7	0.00319
34.1	-0.00956	68.8	0.
34.2	-0.00638	68.9	0.00319
34.3	-0.01594	69.	0.
34.4	-0.00956	69.1	0.
34.5	-0.00319	69.2	0.
34.6	-0.00638		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
ln(Re/rw): 5.658

VISUAL ESTIMATION RESULTS

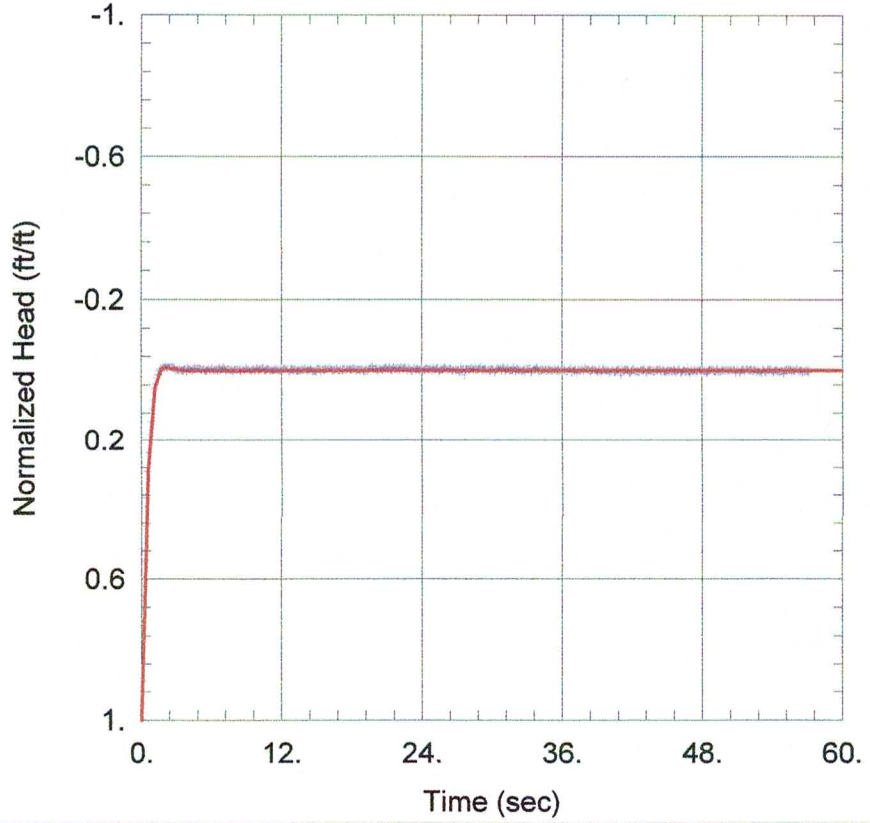
Estimated Parameters

Parameter	Estimate	
K	78.36	ft/day
Le	0.4861	ft

K = 0.02764 cm/sec
T = K*b = 1597.7 ft²/day (17.18 sq. cm/sec)
Le = 0.4861 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 51 IN H2O



PNEUMATIC SLUG TEST

Data Set: K:\...\1343_Test1Springer-Gelhar.aqt
Date: 02/12/13 Time: 13:55:24

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Well: 1343
Test Date: 02/07/2013

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

K = 2550.2 ft/day
Le = 0.01745 ft

AQUIFER DATA

Saturated Thickness: 11.97 ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (1343)

Initial Displacement: 2.11 ft
Total Well Penetration Depth: 18.38 ft
Casing Radius: 0.02083 ft

Static Water Column Height: 11.97 ft
Screen Length: 15. ft
Well Radius: 0.0833 ft

Data Set: K:\ENV\CIMARRON ENVIRONMENTAL RESPONSE TRUST\Site\65944\2013 Slug Testing\ANALYSIS\
Title: Pneumatic Slug Test
Date: 02/14/13
Time: 11:06:41

PROJECT INFORMATION

Company: BMcD
Client: Cimarron Corp.
Project: 65944
Location: Crescent, OK
Test Date: 02/07/2013
Test Well: 1343

AQUIFER DATA

Saturated Thickness: 11.97 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Test Well: 1343

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.11 ft
Static Water Column Height: 11.97 ft
Casing Radius: 0.02083 ft
Well Radius: 0.0833 ft
Well Skin Radius: 0.3438 ft
Screen Length: 15. ft
Total Well Penetration Depth: 18.38 ft

No. of Observations: 573

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.114	28.7	-0.00638
0.1	1.878	28.8	-0.00319
0.2	1.438	28.9	-0.00957
0.3	1.157	29.	-0.00957
0.4	0.9438	29.1	-0.01913
0.5	0.7717	29.2	0.
0.6	0.6154	29.3	-0.00957
0.7	0.4974	29.4	-0.00957
0.8	0.3858	29.5	-0.00957
0.9	0.3029	29.6	0.
1.	0.2296	29.7	-0.00638
1.1	0.1754	29.8	-0.00319
1.2	0.1052	29.9	0.00319
1.3	0.07653	30.	-0.00957
1.4	0.04464	30.1	-0.00638
1.5	0.02232	30.2	-0.00957
1.6	0.	30.3	0.01275
1.7	-0.01276	30.4	-0.00319
1.8	0.	30.5	-0.00957
1.9	-0.01913	30.6	-0.01276
2.	-0.01913	30.7	-0.00638
2.1	-0.03189	30.8	-0.01276
2.2	-0.01913	30.9	0.
2.3	-0.02232	31.	-0.01913
2.4	-0.02551	31.1	-0.00957
2.5	-0.01913	31.2	0.00638
2.6	-0.02232	31.3	-0.00957
2.7	-0.01913	31.4	-0.01276
2.8	-0.01594	31.5	-0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.9	-0.01594	31.6	0.
3.	-0.00638	31.7	-0.00319
3.1	-0.00638	31.8	0.
3.2	-0.00638	31.9	-0.01913
3.3	-0.00638	32.	-0.00638
3.4	-0.01276	32.1	0.00957
3.5	-0.00319	32.2	-0.01276
3.6	0.	32.3	-0.00319
3.7	-0.00638	32.4	0.
3.8	-0.01276	32.5	-0.00319
3.9	0.00319	32.6	0.00319
4.	-0.01913	32.7	-0.00319
4.1	-0.00957	32.8	-0.00957
4.2	-0.00638	32.9	0.00957
4.3	-0.01276	33.	-0.00957
4.4	-0.00319	33.1	-0.00957
4.5	-0.00957	33.2	-0.00638
4.6	-0.01594	33.3	-0.00957
4.7	-0.00957	33.4	0.01275
4.8	-0.01276	33.5	0.
4.9	-0.01276	33.6	-0.00638
5.	-0.01276	33.7	-0.01276
5.1	-0.00957	33.8	-0.00957
5.2	-0.00638	33.9	-0.01913
5.3	-0.00957	34.	-0.00319
5.4	-0.00957	34.1	0.00638
5.5	0.	34.2	-0.00319
5.6	0.	34.3	0.
5.7	-0.00638	34.4	-0.00638
5.8	-0.01276	34.5	0.
5.9	-0.00319	34.6	-0.00638
6.	-0.00638	34.7	0.
6.1	-0.01594	34.8	0.
6.2	-0.00638	34.9	-0.00638
6.3	-0.00957	35.	-0.00638
6.4	-0.00638	35.1	0.
6.5	-0.00957	35.2	0.
6.6	-0.00319	35.3	0.
6.7	-0.01594	35.4	-0.00638
6.8	-0.00638	35.5	-0.00319
6.9	-0.00957	35.6	-0.00319
7.	-0.00957	35.7	-0.00638
7.1	-0.01913	35.8	0.00319
7.2	-0.01276	35.9	0.
7.3	0.00638	36.	0.
7.4	-0.00638	36.1	0.00319
7.5	-0.00957	36.2	-0.00638
7.6	-0.00957	36.3	-0.00638
7.7	-0.00319	36.4	0.00319
7.8	-0.00638	36.5	0.00319
7.9	0.00319	36.6	-0.00638
8.	-0.00957	36.7	-0.00319
8.1	-0.00638	36.8	-0.01276
8.2	-0.00638	36.9	0.00957
8.3	-0.00638	37.	-0.00319
8.4	-0.00957	37.1	0.
8.5	-0.00638	37.2	-0.00638
8.6	0.00638	37.3	0.01275
8.7	-0.00957	37.4	-0.00638
8.8	-0.00638	37.5	0.
8.9	0.	37.6	0.
9.	-0.01594	37.7	-0.00319
9.1	-0.00638	37.8	-0.00957
9.2	-0.00957	37.9	0.00319
9.3	-0.00638	38.	-0.01594
9.4	0.	38.1	-0.00319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.5	-0.00319	38.2	-0.00638
9.6	-0.00638	38.3	-0.00319
9.7	-0.00957	38.4	-0.00319
9.8	0.	38.5	0.00638
9.9	-0.01594	38.6	-0.00319
10.	-0.01276	38.7	-0.00638
10.1	-0.00319	38.8	-0.00319
10.2	-0.00957	38.9	-0.00319
10.3	-0.00638	39.	0.
10.4	-0.01594	39.1	0.00957
10.5	-0.01276	39.2	-0.00957
10.6	-0.00638	39.3	0.
10.7	-0.00319	39.4	0.01275
10.8	-0.00957	39.5	-0.00319
10.9	-0.01276	39.6	-0.00957
11.	-0.00319	39.7	0.
11.1	0.	39.8	0.
11.2	-0.00638	39.9	0.00319
11.3	-0.00319	40.	-0.00319
11.4	-0.00638	40.1	0.00957
11.5	-0.00638	40.2	0.00638
11.6	-0.01276	40.3	-0.00319
11.7	0.	40.4	-0.00319
11.8	-0.00638	40.5	0.00638
11.9	0.	40.6	0.00957
12.	-0.00638	40.7	-0.00319
12.1	-0.00319	40.8	-0.00319
12.2	-0.00957	40.9	-0.00638
12.3	-0.01276	41.	0.
12.4	-0.00638	41.1	0.02551
12.5	-0.01276	41.2	-0.00638
12.6	-0.00638	41.3	0.
12.7	0.00638	41.4	-0.00319
12.8	-0.00638	41.5	-0.00319
12.9	-0.00957	41.6	-0.00319
13.	-0.00638	41.7	-0.00319
13.1	-0.00319	41.8	0.00319
13.2	-0.01276	41.9	0.01275
13.3	0.	42.	0.
13.4	0.	42.1	-0.00319
13.5	-0.00319	42.2	-0.00638
13.6	0.	42.3	0.00319
13.7	-0.00638	42.4	0.00319
13.8	-0.00319	42.5	0.
13.9	-0.00638	42.6	0.00638
14.	-0.00957	42.7	0.00638
14.1	-0.01276	42.8	-0.00638
14.2	0.	42.9	-0.00319
14.3	-0.00957	43.	0.
14.4	0.	43.1	-0.00957
14.5	-0.01594	43.2	0.
14.6	-0.00319	43.3	0.01275
14.7	0.00319	43.4	-0.00319
14.8	-0.00319	43.5	-0.00319
14.9	0.00319	43.6	-0.00319
15.	0.00319	43.7	0.
15.1	-0.00957	43.8	0.
15.2	-0.00957	43.9	0.00319
15.3	-0.00638	44.	0.00319
15.4	0.00319	44.1	-0.00638
15.5	-0.00957	44.2	-0.00638
15.6	-0.00638	44.3	-0.00319
15.7	-0.00319	44.4	-0.00957
15.8	-0.00957	44.5	0.
15.9	-0.00957	44.6	0.00638
16.	-0.00638	44.7	-0.00638

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
16.1	-0.00957	44.8	0.00319
16.2	-0.01276	44.9	0.00638
16.3	-0.00957	45.	0.00638
16.4	0.	45.1	0.
16.5	-0.00319	45.2	0.00319
16.6	-0.00638	45.3	0.
16.7	-0.00957	45.4	-0.00319
16.8	-0.00957	45.5	0.00638
16.9	0.	45.6	-0.00319
17.	0.	45.7	-0.00319
17.1	-0.00957	45.8	0.00638
17.2	0.	45.9	-0.00319
17.3	-0.00638	46.	-0.00319
17.4	-0.00957	46.1	-0.00957
17.5	-0.00319	46.2	0.00957
17.6	-0.00957	46.3	0.00957
17.7	-0.00957	46.4	-0.00319
17.8	-0.00957	46.5	-0.00638
17.9	-0.00957	46.6	0.00638
18.	-0.00957	46.7	0.00319
18.1	-0.00957	46.8	-0.01276
18.2	-0.00957	46.9	0.00319
18.3	-0.00957	47.	0.01594
18.4	-0.00319	47.1	-0.00638
18.5	-0.00638	47.2	0.
18.6	-0.00638	47.3	0.00319
18.7	-0.00319	47.4	-0.00638
18.8	-0.00638	47.5	0.00319
18.9	-0.00638	47.6	0.
19.	-0.00319	47.7	-0.00319
19.1	0.00638	47.8	-0.00319
19.2	0.	47.9	-0.00319
19.3	-0.00957	48.	0.00319
19.4	0.00319	48.1	-0.00319
19.5	-0.00957	48.2	0.00319
19.6	-0.00957	48.3	0.
19.7	-0.01276	48.4	0.01594
19.8	-0.02551	48.5	0.00638
19.9	-0.00957	48.6	-0.00319
20.	-0.00957	48.7	-0.00638
20.1	-0.01276	48.8	-0.00638
20.2	-0.00638	48.9	-0.00319
20.3	0.00319	49.	0.
20.4	-0.00957	49.1	0.
20.5	-0.00638	49.2	0.00638
20.6	-0.00638	49.3	-0.00957
20.7	-0.00638	49.4	0.00638
20.8	-0.01276	49.5	0.00638
20.9	-0.01594	49.6	0.00638
21.	-0.01594	49.7	-0.00319
21.1	-0.00638	49.8	-0.00319
21.2	-0.00957	49.9	-0.00319
21.3	-0.01913	50.	0.
21.4	-0.00319	50.1	-0.00319
21.5	-0.00638	50.2	0.
21.6	-0.01913	50.3	0.
21.7	-0.00957	50.4	-0.00319
21.8	-0.01276	50.5	-0.00319
21.9	-0.00638	50.6	0.
22.	-0.01594	50.7	-0.00638
22.1	-0.00319	50.8	-0.00638
22.2	-0.01594	50.9	0.01275
22.3	-0.01594	51.	-0.00638
22.4	-0.00957	51.1	0.
22.5	-0.00957	51.2	0.
22.6	-0.01594	51.3	0.01275

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
22.7	-0.00957	51.4	-0.00319
22.8	0.	51.5	-0.00638
22.9	-0.01594	51.6	0.00319
23.	-0.00957	51.7	0.00638
23.1	-0.00319	51.8	-0.00638
23.2	0.00319	51.9	-0.00638
23.3	-0.00638	52.	-0.00319
23.4	-0.01276	52.1	-0.00319
23.5	-0.00319	52.2	-0.00319
23.6	-0.00957	52.3	0.
23.7	-0.00957	52.4	0.00319
23.8	0.	52.5	-0.00638
23.9	-0.00319	52.6	-0.00319
24.	-0.01276	52.7	0.00957
24.1	-0.00319	52.8	-0.00319
24.2	-0.00638	52.9	0.00957
24.3	-0.00319	53.	0.00319
24.4	-0.01276	53.1	0.01594
24.5	-0.00957	53.2	-0.00319
24.6	-0.00638	53.3	-0.00319
24.7	-0.00319	53.4	0.00319
24.8	-0.01276	53.5	0.00957
24.9	0.	53.6	-0.00319
25.	-0.01276	53.7	-0.00319
25.1	-0.00319	53.8	0.
25.2	-0.00319	53.9	-0.00957
25.3	-0.01276	54.	0.
25.4	-0.01276	54.1	0.01275
25.5	0.00957	54.2	0.00638
25.6	-0.00319	54.3	-0.00319
25.7	-0.00638	54.4	-0.00319
25.8	0.	54.5	0.00319
25.9	-0.01594	54.6	0.00319
26.	-0.01594	54.7	0.00638
26.1	-0.00957	54.8	0.00319
26.2	-0.00319	54.9	0.
26.3	-0.00319	55.	0.01913
26.4	-0.00957	55.1	0.
26.5	-0.01276	55.2	0.
26.6	0.	55.3	-0.00319
26.7	0.	55.4	-0.00319
26.8	-0.00319	55.5	-0.00319
26.9	0.	55.6	-0.00957
27.	-0.00638	55.7	0.00638
27.1	-0.00319	55.8	-0.00319
27.2	0.	55.9	0.
27.3	0.01275	56.	0.00319
27.4	-0.02232	56.1	-0.00638
27.5	-0.00319	56.2	-0.00319
27.6	-0.00638	56.3	0.00638
27.7	0.02551	56.4	0.
27.8	-0.00638	56.5	0.
27.9	-0.00957	56.6	0.00957
28.	-0.00957	56.7	0.00319
28.1	-0.00638	56.8	0.00638
28.2	-0.00957	56.9	0.00319
28.3	-0.01276	57.	0.
28.4	-0.00957	57.1	0.00957
28.5	-0.00319	57.2	0.
28.6	-0.01276		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Springer-Gelhar

ln(Re/rw): 4.12

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	2550.2	ft/day
Le	0.01745	ft

K = 0.8997 cm/sec
T = K*b = 3.053E+4 ft²/day (328.2 sq. cm/sec)
Le = 0.01745 ft
Solution is critically damped when C(D) = 1.

NOTES

Well Pressure = 43 IN H2O