APPENDIX E

SLUG TESTING METHODOLOGY AND RESULTS

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List of Acronyms

ft/day	feet per day

1.0 Purpose

The purpose of this appendix is to determine the hydraulic conductivity of aquifer materials in the vicinity of five selected monitoring wells at the Former Chemical Laundry and Motor Pool Area, Parcel 94(7) based on slug tests conducted in November 2001. The following wells were tested:

Residuum aquifer:
- FTA-94-MW01
- FTA-94-MW02
- FTA-94-MW05

Bedrock aquifer:
- FTA-94-MW11
- FTA-94-MW12

2.0 Field Procedures

Slug tests were carried out at each of the wells listed above using the methodology specified in Section 5.4.1 of the *Draft Installation-Wide Sampling and Analysis Plan* (IT Corporation, 2002). Two slug tests were carried out at each well, a rising head test and a falling head test, unless the static water level measured was below the top of the screened interval, in which case only a rising head test was carried out (FTA-94-MW05).

At the start of the tests, the monitoring well cap was removed and the monitoring well air headspace was surveyed using a photoionization detector. The depth to water and total depth of the well were measured using a depth to water level indicator. The MiniTroll™ pressure transducer/data logger connected to a laptop computer running Super Slug™ was lowered into the well to a depth that would allow a 10-foot slug to be lowered so that the top of the slug was 1-foot below the static water level and the bottom of the slug was not touching the transducer/data logger. A 10-foot slug was lowered into the well so that it was just above the static water level. The well was allowed to return to its static water level before proceeding with the falling head test. The transducer/data logger was activated and the slug was lowered into the well so that its top was at least 1-foot below the static water level and bottom not touching the transducer/data logger. Data was logged until the water level returned to within 0.1-foot of static water level. The rising head test was carried out by activating the data logger as the slug was removed from the well. Data was logged until the water level returned to within 0.1-foot of static water level.

3.0 Analysis Method

The computer program Super Slug™ was utilized to analyze the slug test data. The program is a recently developed window version numerical tool specifically designed for slug test analysis. A unique feature of this program is its ability to automatically filter unusable data (noise signal); also, the software adjusts test data so that the s-t curve begins at the maximum water level displacement. It also offers versatile graphic capabilities and three commonly used slug test analysis methods for selection by users, including Bouwer and Rice (1976), Cooper, Bredehoeft and Papadopulos (1967), and Hvorslev (1951). Additionally, Super Slug® allows for more customizable analyses than other commercially available programs by offering various type curve matching and supporting various input/output units.

Two aquifers have been identified for the areas where aquifer tests were conducted. Based on the screen interval, three wells tested are in the residuum, and two in the bedrock.

4.0 Theory

The Bouwer and Rice (1976) method for unconfined aquifers is based on the following equations:

$$K = \left[\frac{r_c^2 \ln(R_e / r_w)}{2 L_{scr}} \right] \frac{1}{t} \ln \frac{H_o}{H_t} \qquad \text{Eq. 1}$$

where:

K	=	Aquifer hydraulic conductivity
r_c	=	Radius of the well casing
t	=	Time since slug removal or injections
H_t	=	Head in well at time t
H_0	=	Initial head change from static water level
R_e	=	Radius of influence of the test
r_w	=	Effective radius of the well (radius of well and gravel pack)
L_{scr}	=	Length of the well screen or open hole.

For partial penetration scenarios, the Equation 2 can be used to calculate the radius of influence R_e:

$$ln\frac{R_e}{r_w}=\left[\frac{1.1}{ln(Z/r_w)}+\frac{A+B\,ln[(D-Z)/r_w]}{L_{scr}/r_w}\right]^{-1} \qquad \text{Eq. 2}$$

For fully penetrating wells using Equation 3:

$$ln\frac{R_e}{r_w}=\left[\frac{1.1}{ln(Z/r_w)}+\frac{C}{L_{scr}/r_w}\right]^{-1} \qquad \text{Eq. 3}$$

where:

D = Aquifer saturated thickness
Z = Height of water column in the well.

Super Slug® automatically determines A, B, and C based on the amount of penetration of the aquifer by the well. Super Slug® automatically determines if the well is fully or partially penetrating and selects the proper parameters. If the well is greater than 95 percent fully penetrating, Super Slug® will assume full penetration and use Equation 3.

When water level fluctuations occur within the screened interval of the well, the term r should be adjusted to account for the filter pack and the larger borehole size (after Bouwer, 1989) using the equation below:

$$r_{cadj}=\left[r_c^2+n(r_w^2-r_c^2)\right]^{1/2} \qquad \text{Eq. 4}$$

where:

n = Filter pack porosity (assumed 30 %).

Cooper, Bredehoeft and Papadopulos' (1967) method is developed for use in confined aquifers that are fully penetrated by the well screen. A series of type curves is plotted semi-logarithmically, with F (alpha, beta) plotted arithmetically on the vertical axis, and beta plotted logarithmically on the horizontal axis. A different curve is plotted for each selected value of alpha.

Time and Head Ratio values are plotted semi-logarithmically to the same scale as the type curves. Head Ratio is plotted arithmetically on the vertical scale; also, a log of time is plotted on the horizontal scale. The data is fit to a type curve, and a value of alpha is estimated.

When the match is indicated, Super Slug ® determines the match point of F (alpha, beta) and beta for the value of time = 0.1 days and head ratio = 0.5. These match points will be indicated with the results of the calculations.

Using Equation 5 below, aquifer transmissivity is determined from the values of t = 0.1 and the beta value calculated from the match curve:

$$\beta = T\tau / r^2 c \qquad \text{Eq. 5}$$

where:

T	=	Aquifer transmissivity
t	=	Time since slug removal or injection
r_c	=	Radius of well casing.

Using Equation 6 below, storativity is calculated from the value of alpha estimated by the user:

$$\alpha = r_w^2 S / r^2 c \qquad \text{Eq. 6}$$

where:

S	=	Aquifer storativity
r_w	=	Radius of well casing
r_c	=	Radius of well casing.

Because of the similar shape of the type curves, it may be difficult to obtain a unique match for one type curve, especially as alpha becomes small. Papadopulos et al. (1973) state that for alpha less than 10^{-5}, if the error in the chosen alpha is within two orders of magnitude of its actual value, the error in the determined transmissivity would be less than 30 percent.

5.0 Assumptions

The Bouwer and Rice (1976) slug test analysis method for unconfined aquifers is based on the following assumptions:

- The aquifer is homogeneous, isotropic and unconfined
- Drawdown is negligible compared to aquifer thickness
- Flow in the unsaturated zone is negligible
- Well losses are negligible.

Cooper, Bredehoeft and Papadopulos' (1967) method for confined aquifers is based on the following assumptions:

- Aquifer has infinite areal extent
- Aquifer is homogeneous, isotropic and of uniform thickness
- Aquifer's potentiometric surface is initially horizontal
- A volume of water, V, is injected or discharged from the well instantaneously
- Test well is fully penetrating
- Flow to the test well is horizontal.

These assumptions represent the ideal conditions in which the calculations are exact and precise while any deviation from these assumptions, often encountered in the field conditions, will result in the testing results being approximate.

6.0 Results

Both falling and rising tests were conducted in five selected wells in November 2001. Table 1 summarizes the conditions under which the tests were conducted including depth to groundwater, the total well depth, and the geometric data of each well tested. The calculated hydraulic conductivity (K) and transmissivity (T) values are summarized in Table 2.

The Bouwer and Rice (1976) method for unconfined aquifers was chosen to analyze the test data for the selected monitoring wells. The hydraulic conductivity values in the residuum ranged from 1.02 feet per day (ft/day) at FTA-94-MW02 (rising test) to 9.72 ft/day at FTA-94-MW01 (falling test), with a geometric mean of 4.09 ft/day. In the bedrock aquifer, hydraulic conductivity ranged from 0.00636 ft/day at FTA-94-MW12 (rising test) to 2.91 ft/day at FTA-94-MW11 (falling test), with a geometric mean of 0.142 ft/day.

7.0 References

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Table 1

Summary of Monitoring Well Geometry Data
The Former Chemical Laundry and Motor Pool Area 1500, Parcel 94 (7)
Fort McClellan, Calhoun County, AL

Well No.	Water Level (TOC) (ft)	Total Depth (TOC) (ft)	D (Assumed)	r_c (in)	r_w (in)	L_{scr} (ft)	Z (ft)
Residuum							
FTA-94-MW01	26.55	44.6	18.05	2	4.25	10	18.05
FTA-94-MW02	31.7	55.8	24.1	1	4.125	15	24.1
FTA-94-MW05	25.6	38.4	12.8	1	4	15	12.8
Bedrock							
FTA-94-MW11	25.95	70.7	44.75	2	3.94	10	44.75
FTA-94-MW12	6.95	94	87.05	1	3.125	10	87.05

Note:
- D ---- Aquifer saturated thickness (assumed)
- r_c ---- Radius of well casing
- r_w ---- Radius of boring
- L_{scr} ---- Length of saturated well screen
- Z ---- Static height of water in well
- n ---- Porosity of filter pack (Assumed to be 30 percent. Porosities of unconsolidated sand range from 25 to 50 percent [Freeze and Cherry, 1979])

Table 2
Summary of Hydraulic Conductivities
The Former Chemical Laundry and Motor Pool Area 1500, Parcel 94 (7)
Fort McClellan, Calhoun County, AL

Well No.	Date Tested	Aquifer Response	Saturated Aquifer Thickness (Assumed)	Test Type	Transmisivities T (ft^2/day)	Hydraulic Conductivities K (ft/min)	Hydraulic Conductivities K (cm/sec)	Hydraulic Conductivities K (ft/day)
Residuum								
FTA-94-MW01	11/26/2001	Unconfined	18.05	Falling	1.77E+02	6.75E-03	3.43E-03	9.72E+00
				Rising	1.13E+02	4.26E-03	2.17E-03	6.14E+00
FTA-94-MW02	11/26/2001	Unconfined	24.10	Falling	5.24E+01	1.51E-03	7.68E-04	2.18E+00
				Rising	2.46E+01	7.10E-04	3.61E-04	1.02E+00
FTA-94-MW05	11/27/2001	Unconfined	12.80	Rising	1.11E+02	6.02E-03	3.06E-03	8.67E+00
Maximum					1.77E+02	6.75E-03	3.43E-03	9.72E+00
Minimum					2.46E+01	7.10E-04	3.61E-04	1.02E+00
Geometric Mean					7.79E+01	2.84E-03	1.45E-03	4.09E+00
Bedrock								
FTA-94-MW11	11/26/2001	Unconfined	44.75	Falling	1.30E+02	2.02E-03	1.03E-03	2.91E+00
				Rising	7.14E+01	1.11E-03	5.63E-04	1.60E+00
FTA-94-MW12	11/26/2001	Unconfined	87.05	Falling	1.24E+00	9.42E-06	4.79E-06	1.36E-02
				Rising	5.61E-01	4.42E-06	2.25E-06	6.36E-03
Maximum					1.30E+02	2.02E-03	1.03E-03	2.91E+00
Minimum					5.61E-01	4.42E-06	2.25E-06	6.36E-03
Geometric Mean					8.96E+00	9.83E-05	5.00E-05	1.42E-01

Notes: 1 Saturated Aquifer Thickness
For a confined Aquifer, this is the distance from the base of the upper confining unit to the top of the lower confining unit.
For an unconfined aquifer, this is the distance from the water table to the top of the lower confining unit.
2 Analysis Method
Cooper, Bredehoeft, Papadopulos (1967) method is used for the well with confined aquifers response.
Bouwer and Rice (1976) method is used for the well with unconfined aquifers response.

ATTACHMENT 1

TIME VERSUS DRAWDOWN DATA AND FIELD ACTIVITY DAILY LOGS

TIME VERSUS DRAWDOWN DATA

Falling Head Test

Site Name:	Fort McClellan
Location:	Parcel 94 (7)
Test Date:	11/26/01
Import File:	C:\Documents and Settings\jli\My Documents\Projects\FTMA\94mw1f.txt

Well Label:	FTA-94-MW01
Aquifer Thickness:	18.05 feet
Screen Length:	10. feet
Casing Radius:	2. inches
Effective Radius:	4.25 inches
Static Water Level:	0. feet
Water Table to Screen Bottom:	18.05 feet
Anisotropy Ratio:	1.
Time Adjustment:	0.9 Seconds

Test starts with trial 3
There are 119 time and drawdown measurements
Maximum head is 11.13 feet
Minimum head is -0.544 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-1.5e-002	1.7e-002	-1.7e-002	-1.527e-003
2	5.e-003	-1.e-002	1.5e-002	-1.5e-002	-1.347e-003
3	1.e-002	-5.e-003	1.e-002	-1.e-002	-8.983e-004
4	1.5e-002	0.	-11.13	11.13	1.
5	2.e-002	5.e-003	-2.39	2.39	0.2147
6	2.5e-002	1.e-002	0.544	-0.544	-4.887e-002
7	3.e-002	1.5e-002	-0.504	0.504	4.527e-002
8	3.5e-002	2.e-002	-1.622	1.622	0.1457
9	4.e-002	2.5e-002	-1.272	1.272	0.1143
10	4.5e-002	3.e-002	-0.641	0.641	5.758e-002
11	5.e-002	3.5e-002	-1.076	1.076	9.666e-002
12	5.5e-002	4.e-002	-0.919	0.919	8.255e-002
13	6.e-002	4.5e-002	-1.149	1.149	0.1032
14	6.5e-002	5.e-002	-0.934	0.934	8.39e-002
15	7.e-002	5.5e-002	-0.944	0.944	8.48e-002
16	7.5e-002	6.e-002	-0.971	0.971	8.723e-002
17	8.e-002	6.5e-002	-0.954	0.954	8.57e-002
18	8.48e-002	6.98e-002	-0.959	0.959	8.615e-002
19	9.e-002	7.5e-002	-0.939	0.939	8.435e-002

20	9.5e-002	8.e-002	-0.932	0.932	8.372e-002
21	0.1	8.5e-002	-0.934	0.934	8.39e-002
22	0.1058	9.08e-002	-0.932	0.932	8.372e-002
23	0.112	9.7e-002	-0.936	0.936	8.408e-002
24	0.1185	0.1035	-0.917	0.917	8.238e-002
25	0.1255	0.1105	-0.905	0.905	8.13e-002
26	0.1328	0.1178	-0.905	0.905	8.13e-002
27	0.1407	0.1257	-0.89	0.89	7.995e-002
28	0.149	0.134	-0.89	0.89	7.995e-002
29	0.1578	0.1428	-0.892	0.892	8.013e-002
30	0.167	0.152	-0.846	0.846	7.6e-002
31	0.177	0.162	-0.849	0.849	7.627e-002
32	0.1875	0.1725	-0.849	0.849	7.627e-002
33	0.1985	0.1835	-0.849	0.849	7.627e-002
34	0.2102	0.1952	-0.836	0.836	7.51e-002
35	0.2227	0.2077	-0.819	0.819	7.357e-002
36	0.2358	0.2208	-0.812	0.812	7.294e-002
37	0.2498	0.2348	-0.802	0.802	7.204e-002
38	0.2647	0.2497	-0.79	0.79	7.097e-002
39	0.2803	0.2653	-0.778	0.778	6.989e-002
40	0.297	0.282	-0.765	0.765	6.872e-002
41	0.3147	0.2997	-0.753	0.753	6.764e-002
42	0.3333	0.3183	-0.738	0.738	6.63e-002
43	0.3532	0.3382	-0.726	0.726	6.522e-002
44	0.3742	0.3592	-0.704	0.704	6.324e-002
45	0.3963	0.3813	-0.689	0.689	6.189e-002
46	0.4198	0.4048	-0.665	0.665	5.974e-002
47	0.4447	0.4297	-0.653	0.653	5.866e-002
48	0.4697	0.4547	-0.565	0.565	5.075e-002
49	0.4963	0.4813	-0.643	0.643	5.776e-002
50	0.5247	0.5097	-0.584	0.584	5.246e-002
51	0.5547	0.5397	-0.572	0.572	5.138e-002
52	0.5863	0.5713	-0.553	0.553	4.968e-002
53	0.6213	0.6063	-0.531	0.531	4.77e-002
54	0.6578	0.6428	-0.509	0.509	4.572e-002
55	0.6963	0.6813	-0.492	0.492	4.42e-002
56	0.738	0.723	-0.467	0.467	4.195e-002
57	0.7813	0.7663	-0.445	0.445	3.997e-002
58	0.828	0.813	-0.423	0.423	3.8e-002
59	0.8763	0.8613	-0.399	0.399	3.584e-002
60	0.928	0.913	-0.377	0.377	3.387e-002

61	0.983	0.968	-0.357	0.357	3.207e-002
62	1.041	1.026	-0.335	0.335	3.009e-002
63	1.103	1.088	-0.313	0.313	2.812e-002
64	1.168	1.153	-0.296	0.296	2.659e-002
65	1.238	1.223	-0.267	0.267	2.398e-002
66	1.311	1.296	-0.254	0.254	2.282e-002
67	1.39	1.375	-0.232	0.232	2.084e-002
68	1.473	1.458	-0.218	0.218	1.958e-002
69	1.561	1.546	-0.201	0.201	1.806e-002
70	1.655	1.64	-0.186	0.186	1.671e-002
71	1.753	1.738	-0.169	0.169	1.518e-002
72	1.858	1.843	-0.152	0.152	1.365e-002
73	1.968	1.953	-0.142	0.142	1.276e-002
74	2.085	2.07	-0.13	0.13	1.168e-002
75	2.21	2.195	-0.115	0.115	1.033e-002
76	2.341	2.326	-0.1	0.1	8.983e-003
77	2.481	2.466	-9.3e-002	9.3e-002	8.354e-003
78	2.63	2.615	-8.1e-002	8.1e-002	7.276e-003
79	2.786	2.771	-7.4e-002	7.4e-002	6.648e-003
80	2.953	2.938	-6.6e-002	6.6e-002	5.929e-003
81	3.13	3.115	-6.1e-002	6.1e-002	5.48e-003
82	3.316	3.301	-5.4e-002	5.4e-002	4.851e-003
83	3.515	3.5	-4.9e-002	4.9e-002	4.402e-003
84	3.725	3.71	-4.2e-002	4.2e-002	3.773e-003
85	3.946	3.931	-4.2e-002	4.2e-002	3.773e-003
86	4.181	4.166	-3.4e-002	3.4e-002	3.054e-003
87	4.43	4.414	-2.9e-002	2.9e-002	2.605e-003
88	4.693	4.678	-2.5e-002	2.5e-002	2.246e-003
89	4.973	4.958	-2.2e-002	2.2e-002	1.976e-003
90	5.27	5.255	-2.e-002	2.e-002	1.797e-003
91	5.583	5.568	-1.7e-002	1.7e-002	1.527e-003
92	5.915	5.9	-1.5e-002	1.5e-002	1.347e-003
93	6.266	6.251	-1.5e-002	1.5e-002	1.347e-003
94	6.64	6.625	-1.2e-002	1.2e-002	1.078e-003
95	7.035	7.02	-1.e-002	1.e-002	8.983e-004
96	7.453	7.438	-7.e-003	7.e-003	6.288e-004
97	7.896	7.881	-7.e-003	7.e-003	6.288e-004
98	8.366	8.351	-5.e-003	5.e-003	4.492e-004
99	8.865	8.85	-3.e-003	3.e-003	2.695e-004
100	9.391	9.376	-5.e-003	5.e-003	4.492e-004
101	9.95	9.935	-3.e-003	3.e-003	2.695e-004

102	10.54	10.53	0.	0.	0.
103	11.17	11.15	0.	0.	0.
104	11.83	11.82	0.	0.	0.
105	12.53	12.52	2.e-003	-2.e-003	-1.797e-004
106	13.28	13.26	0.	0.	0.
107	14.07	14.05	2.e-003	-2.e-003	-1.797e-004
108	14.91	14.89	2.e-003	-2.e-003	-1.797e-004
109	15.79	15.78	0.	0.	0.
110	16.73	16.71	0.	0.	0.
111	17.72	17.71	5.e-003	-5.e-003	-4.492e-004
112	18.78	18.76	2.e-003	-2.e-003	-1.797e-004
113	19.89	19.88	2.e-003	-2.e-003	-1.797e-004
114	21.07	21.06	5.e-003	-5.e-003	-4.492e-004
115	22.32	22.31	2.e-003	-2.e-003	-1.797e-004
116	23.65	23.63	5.e-003	-5.e-003	-4.492e-004
117	25.05	25.04	2.e-003	-2.e-003	-1.797e-004
118	26.54	26.53	7.e-003	-7.e-003	-6.288e-004
119	28.12	28.1	0.	0.	0.

20	9.5e-002	7.e-002	0.941	0.941	0.8394
21	0.1	7.5e-002	0.933	0.933	0.8323
22	0.1058	8.08e-002	0.928	0.928	0.8278
23	0.112	8.7e-002	0.919	0.919	0.8198
24	0.1185	9.35e-002	0.909	0.909	0.8109
25	0.1255	0.1005	0.899	0.899	0.802
26	0.1328	0.1078	0.889	0.889	0.793
27	0.1407	0.1157	0.884	0.884	0.7886
28	0.149	0.124	0.87	0.87	0.7761
29	0.1578	0.1328	0.862	0.862	0.769
30	0.167	0.142	0.853	0.853	0.7609
31	0.177	0.152	0.838	0.838	0.7475
32	0.1875	0.1625	0.828	0.828	0.7386
33	0.1985	0.1735	0.818	0.818	0.7297
34	0.2102	0.1852	0.806	0.806	0.719
35	0.2227	0.1977	0.791	0.791	0.7056
36	0.2358	0.2108	0.776	0.776	0.6922
37	0.2498	0.2248	0.762	0.762	0.6798
38	0.2647	0.2397	0.747	0.747	0.6664
39	0.2803	0.2553	0.73	0.73	0.6512
40	0.297	0.272	0.715	0.715	0.6378
41	0.3147	0.2897	0.703	0.703	0.6271
42	0.3333	0.3083	0.683	0.683	0.6093
43	0.3532	0.3282	0.664	0.664	0.5923
44	0.3742	0.3492	0.647	0.647	0.5772
45	0.3963	0.3713	0.63	0.63	0.562
46	0.4198	0.3948	0.612	0.612	0.5459
47	0.4447	0.4197	0.59	0.59	0.5263
48	0.4697	0.4447	0.571	0.571	0.5094
49	0.4963	0.4713	0.554	0.554	0.4942
50	0.5247	0.4997	0.534	0.534	0.4764
51	0.5547	0.5297	0.512	0.512	0.4567
52	0.5863	0.5613	0.495	0.495	0.4416
53	0.6213	0.5963	0.468	0.468	0.4175
54	0.6578	0.6328	0.451	0.451	0.4023
55	0.6963	0.6713	0.434	0.434	0.3872
56	0.738	0.713	0.409	0.409	0.3649
57	0.7813	0.7563	0.385	0.385	0.3434
58	0.828	0.803	0.365	0.365	0.3256
59	0.8763	0.8513	0.343	0.343	0.306
60	0.928	0.903	0.324	0.324	0.289

61	0.983	0.958	0.301	0.301	0.2685
62	1.041	1.016	0.282	0.282	0.2516
63	1.103	1.078	0.26	0.26	0.2319
64	1.168	1.143	0.243	0.243	0.2168
65	1.238	1.213	0.223	0.223	0.1989
66	1.311	1.286	0.206	0.206	0.1838
67	1.39	1.365	0.191	0.191	0.1704
68	1.473	1.448	0.174	0.174	0.1552
69	1.561	1.536	0.157	0.157	0.1401
70	1.655	1.63	0.145	0.145	0.1293
71	1.753	1.728	0.132	0.132	0.1178
72	1.858	1.833	0.115	0.115	0.1026
73	1.968	1.943	0.108	0.108	9.634e-002
74	2.085	2.06	9.8e-002	9.8e-002	8.742e-002
75	2.21	2.185	8.6e-002	8.6e-002	7.672e-002
76	2.341	2.316	8.1e-002	8.1e-002	7.226e-002
77	2.481	2.456	7.3e-002	7.3e-002	6.512e-002
78	2.63	2.605	6.6e-002	6.6e-002	5.888e-002
79	2.786	2.761	5.9e-002	5.9e-002	5.263e-002
80	2.953	2.928	4.9e-002	4.9e-002	4.371e-002
81	3.13	3.105	4.9e-002	4.9e-002	4.371e-002
82	3.316	3.291	4.2e-002	4.2e-002	3.747e-002
83	3.515	3.49	3.9e-002	3.9e-002	3.479e-002
84	3.725	3.7	2.9e-002	2.9e-002	2.587e-002
85	3.946	3.921	3.2e-002	3.2e-002	2.855e-002
86	4.181	4.156	2.7e-002	2.7e-002	2.409e-002
87	4.43	4.404	2.5e-002	2.5e-002	2.23e-002
88	4.693	4.668	2.e-002	2.e-002	1.784e-002
89	4.973	4.948	2.e-002	2.e-002	1.784e-002
90	5.27	5.245	1.7e-002	1.7e-002	1.517e-002
91	5.583	5.558	1.5e-002	1.5e-002	1.338e-002
92	5.915	5.89	1.2e-002	1.2e-002	1.07e-002
93	6.266	6.241	1.2e-002	1.2e-002	1.07e-002
94	6.64	6.615	1.e-002	1.e-002	8.921e-003
95	7.035	7.01	7.e-003	7.e-003	6.244e-003
96	7.453	7.428	0.	0.	0.
97	7.896	7.871	5.e-003	5.e-003	4.46e-003
98	8.366	8.341	2.e-003	2.e-003	1.784e-003
99	8.865	8.84	0.	0.	0.
100	9.391	9.366	-3.e-003	-3.e-003	-2.676e-003
101	9.95	9.925	-8.e-003	-8.e-003	-7.136e-003

102	10.54	10.52	0.	0.	0.
103	11.17	11.14	-3.e-003	-3.e-003	-2.676e-003
104	11.83	11.81	0.	0.	0.

Falling Head Test

Site Name:	Fort McClellan
Location:	Parcel 94 (7)
Test Date:	11/26/01
Import File:	C:\Documents and Settings\jli\My Documents\Projects\FTMA\94mw2f.txt

Well Label:	FTA-94-MW02
Aquifer Thickness:	24.1 feet
Screen Length:	15. feet
Casing Radius:	1. inches
Effective Radius:	4.125 inches
Static Water Level:	0. feet
Water Table to Screen Bottom:	24.1 feet
Anisotropy Ratio:	1.
Time Adjustment:	0.9 Seconds

Test starts with trial 3
There are 103 time and drawdown measurements
Maximum head is 16.99 feet
Minimum head is -0.917 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-1.5e-002	-3.e-002	3.e-002	1.766e-003
2	5.e-003	-1.e-002	-0.159	0.159	9.359e-003
3	1.e-002	-5.e-003	-11.39	11.39	0.6702
4	1.5e-002	0.	-16.99	16.99	1.
5	2.e-002	5.e-003	-10.5	10.5	0.6182
6	2.5e-002	1.e-002	-2.062	2.062	0.1214
7	3.e-002	1.5e-002	0.917	-0.917	-5.398e-002
8	3.5e-002	2.e-002	-1.505	1.505	8.859e-002
9	4.e-002	2.5e-002	-2.519	2.519	0.1483
10	4.5e-002	3.e-002	-3.429	3.429	0.2018
11	5.e-002	3.5e-002	-3.742	3.742	0.2203
12	5.5e-002	4.e-002	-3.307	3.307	0.1947
13	6.e-002	4.5e-002	-2.757	2.757	0.1623
14	6.5e-002	5.e-002	-2.58	2.58	0.1519
15	7.e-002	5.5e-002	-2.779	2.779	0.1636
16	7.5e-002	6.e-002	-2.96	2.96	0.1742
17	8.e-002	6.5e-002	-2.962	2.962	0.1743
18	8.48e-002	6.98e-002	-2.847	2.847	0.1676
19	9.e-002	7.5e-002	-2.771	2.771	0.1631

20	9.5e-002	8.e-002	-2.766	2.766	0.1628
21	0.1	8.5e-002	-2.783	2.783	0.1638
22	0.1058	9.08e-002	-2.781	2.781	0.1637
23	0.112	9.7e-002	-2.761	2.761	0.1625
24	0.1185	0.1035	-2.737	2.737	0.1611
25	0.1255	0.1105	-2.71	2.71	0.1595
26	0.1328	0.1178	-2.7	2.7	0.1589
27	0.1407	0.1257	-2.676	2.676	0.1575
28	0.149	0.134	-2.671	2.671	0.1572
29	0.1578	0.1428	-2.634	2.634	0.155
30	0.167	0.152	-2.617	2.617	0.154
31	0.177	0.162	-2.61	2.61	0.1536
32	0.1875	0.1725	-2.568	2.568	0.1512
33	0.1985	0.1835	-2.544	2.544	0.1497
34	0.2102	0.1952	-2.514	2.514	0.148
35	0.2227	0.2077	-2.483	2.483	0.1462
36	0.2358	0.2208	-2.448	2.448	0.1441
37	0.2498	0.2348	-2.407	2.407	0.1417
38	0.2647	0.2497	-2.363	2.363	0.1391
39	0.2803	0.2653	-2.326	2.326	0.1369
40	0.297	0.282	-2.282	2.282	0.1343
41	0.3147	0.2997	-2.231	2.231	0.1313
42	0.3333	0.3183	-2.187	2.187	0.1287
43	0.3532	0.3382	-2.138	2.138	0.1258
44	0.3742	0.3592	-2.087	2.087	0.1228
45	0.3963	0.3813	-2.035	2.035	0.1198
46	0.4198	0.4048	-1.984	1.984	0.1168
47	0.4447	0.4297	-1.93	1.93	0.1136
48	0.4697	0.4547	-1.876	1.876	0.1104
49	0.4963	0.4813	-1.822	1.822	0.1072
50	0.5247	0.5097	-1.764	1.764	0.1038
51	0.5547	0.5397	-1.71	1.71	0.1007
52	0.5863	0.5713	-1.651	1.651	9.718e-002
53	0.6213	0.6063	-1.588	1.588	9.347e-002
54	0.6578	0.6428	-1.524	1.524	8.971e-002
55	0.6963	0.6813	-1.463	1.463	8.611e-002
56	0.738	0.723	-1.402	1.402	8.252e-002
57	0.7813	0.7663	-1.336	1.336	7.864e-002
58	0.828	0.813	-1.275	1.275	7.505e-002
59	0.8763	0.8613	-1.209	1.209	7.116e-002
60	0.928	0.913	-1.142	1.142	6.722e-002

61	0.983	0.968	-1.079	1.079	6.351e-002
62	1.041	1.026	-1.015	1.015	5.974e-002
63	1.103	1.088	-0.947	0.947	5.574e-002
64	1.168	1.153	-0.886	0.886	5.215e-002
65	1.238	1.223	-0.822	0.822	4.838e-002
66	1.311	1.296	-0.758	0.758	4.462e-002
67	1.39	1.375	-0.697	0.697	4.103e-002
68	1.473	1.458	-0.614	0.614	3.614e-002
69	1.561	1.546	-0.504	0.504	2.967e-002
70	1.655	1.64	-0.443	0.443	2.608e-002
71	1.753	1.738	-0.379	0.379	2.231e-002
72	1.858	1.843	-0.33	0.33	1.942e-002
73	1.968	1.953	-0.281	0.281	1.654e-002
74	2.085	2.07	-0.24	0.24	1.413e-002
75	2.21	2.195	-0.198	0.198	1.165e-002
76	2.341	2.326	-0.167	0.167	9.83e-003
77	2.481	2.466	-0.132	0.132	7.77e-003
78	2.63	2.615	-0.113	0.113	6.651e-003
79	2.786	2.771	-8.4e-002	8.4e-002	4.944e-003
80	2.953	2.938	-6.6e-002	6.6e-002	3.885e-003
81	3.13	3.115	-5.2e-002	5.2e-002	3.061e-003
82	3.316	3.301	-4.4e-002	4.4e-002	2.59e-003
83	3.515	3.5	-2.7e-002	2.7e-002	1.589e-003
84	3.725	3.71	-2.e-002	2.e-002	1.177e-003
85	3.946	3.931	-1.e-002	1.e-002	5.886e-004
86	4.181	4.166	-5.e-003	5.e-003	2.943e-004
87	4.43	4.414	2.e-003	-2.e-003	-1.177e-004
88	4.693	4.678	0.	0.	0.
89	4.973	4.958	7.e-003	-7.e-003	-4.12e-004
90	5.27	5.255	9.e-003	-9.e-003	-5.298e-004
91	5.583	5.568	9.e-003	-9.e-003	-5.298e-004
92	5.915	5.9	1.2e-002	-1.2e-002	-7.063e-004
93	6.266	6.251	1.4e-002	-1.4e-002	-8.241e-004
94	6.64	6.625	9.e-003	-9.e-003	-5.298e-004
95	7.035	7.02	9.e-003	-9.e-003	-5.298e-004
96	7.453	7.438	1.2e-002	-1.2e-002	-7.063e-004
97	7.896	7.881	7.e-003	-7.e-003	-4.12e-004
98	8.366	8.351	7.e-003	-7.e-003	-4.12e-004
99	8.865	8.85	7.e-003	-7.e-003	-4.12e-004
100	9.391	9.376	2.e-003	-2.e-003	-1.177e-004
101	9.95	9.935	2.e-003	-2.e-003	-1.177e-004

102	10.54	10.53	4.e-003	-4.e-003	-2.354e-004
103	11.17	11.15	0.	0.	0.

Rising Head Test

Site Name:	Fort McClellan
Location:	Parcel 94 (7)
Test Date:	11/26/01
Import File:	C:\Documents and Settings\jli\My Documents\Projects\FTMA\94mw2r.txt

Well Label:	FTA-94-MW02
Aquifer Thickness:	24.1 feet
Screen Length:	15. feet
Casing Radius:	1. inches
Effective Radius:	4.125 inches
Static Water Level:	0. feet
Water Table to Screen Bottom:	24.1 feet
Anisotropy Ratio:	1.
Time Adjustment:	0. Seconds

Test starts with trial 0
There are 117 time and drawdown measurements
Maximum head is 3.907 feet
Minimum head is -5.e-003 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	0.	3.907	3.907	1.
2	5.e-003	5.e-003	2.471	2.471	0.6325
3	1.e-002	1.e-002	3.141	3.141	0.8039
4	1.5e-002	1.5e-002	3.536	3.536	0.905
5	2.e-002	2.e-002	3.619	3.619	0.9263
6	2.5e-002	2.5e-002	3.35	3.35	0.8574
7	3.e-002	3.e-002	3.325	3.325	0.851
8	3.5e-002	3.5e-002	3.269	3.269	0.8367
9	4.e-002	4.e-002	3.227	3.227	0.826
10	4.5e-002	4.5e-002	3.188	3.188	0.816
11	5.e-002	5.e-002	3.144	3.144	0.8047
12	5.5e-002	5.5e-002	3.11	3.11	0.796
13	6.e-002	6.e-002	3.078	3.078	0.7878
14	6.5e-002	6.5e-002	3.039	3.039	0.7778
15	7.e-002	7.e-002	3.012	3.012	0.7709
16	7.5e-002	7.5e-002	2.985	2.985	0.764
17	8.e-002	8.e-002	2.953	2.953	0.7558
18	8.48e-002	8.48e-002	2.917	2.917	0.7466
19	9.e-002	9.e-002	2.897	2.897	0.7415

20	9.5e-002	9.5e-002	2.87	2.87	0.7346
21	0.1	0.1	2.829	2.829	0.7241
22	0.1058	0.1058	2.814	2.814	0.7202
23	0.112	0.112	2.782	2.782	0.7121
24	0.1185	0.1185	2.755	2.755	0.7051
25	0.1255	0.1255	2.721	2.721	0.6964
26	0.1328	0.1328	2.685	2.685	0.6872
27	0.1407	0.1407	2.64	2.64	0.6757
28	0.149	0.149	2.611	2.611	0.6683
29	0.1578	0.1578	2.57	2.57	0.6578
30	0.167	0.167	2.533	2.533	0.6483
31	0.177	0.177	2.501	2.501	0.6401
32	0.1875	0.1875	2.457	2.457	0.6289
33	0.1985	0.1985	2.418	2.418	0.6189
34	0.2102	0.2102	2.381	2.381	0.6094
35	0.2227	0.2227	2.33	2.33	0.5964
36	0.2358	0.2358	2.293	2.293	0.5869
37	0.2498	0.2498	2.246	2.246	0.5749
38	0.2647	0.2647	2.2	2.2	0.5631
39	0.2803	0.2803	2.146	2.146	0.5493
40	0.297	0.297	2.104	2.104	0.5385
41	0.3147	0.3147	2.051	2.051	0.525
42	0.3333	0.3333	2.004	2.004	0.5129
43	0.3532	0.3532	1.95	1.95	0.4991
44	0.3742	0.3742	1.896	1.896	0.4853
45	0.3963	0.3963	1.845	1.845	0.4722
46	0.4198	0.4198	1.786	1.786	0.4571
47	0.4447	0.4447	1.735	1.735	0.4441
48	0.4697	0.4697	1.679	1.679	0.4297
49	0.4963	0.4963	1.625	1.625	0.4159
50	0.5247	0.5247	1.569	1.569	0.4016
51	0.5547	0.5547	1.512	1.512	0.387
52	0.5863	0.5863	1.451	1.451	0.3714
53	0.6213	0.6213	1.395	1.395	0.3571
54	0.6578	0.6578	1.334	1.334	0.3414
55	0.6963	0.6963	1.278	1.278	0.3271
56	0.738	0.738	1.219	1.219	0.312
57	0.7813	0.7813	1.153	1.153	0.2951
58	0.828	0.828	1.101	1.101	0.2818
59	0.8763	0.8763	1.042	1.042	0.2667
60	0.928	0.928	0.979	0.979	0.2506

61	0.983	0.983	0.923	0.923	0.2362
62	1.041	1.041	0.866	0.866	0.2217
63	1.103	1.103	0.81	0.81	0.2073
64	1.168	1.168	0.751	0.751	0.1922
65	1.238	1.238	0.702	0.702	0.1797
66	1.311	1.311	0.651	0.651	0.1666
67	1.39	1.39	0.602	0.602	0.1541
68	1.473	1.473	0.553	0.553	0.1415
69	1.561	1.561	0.507	0.507	0.1298
70	1.655	1.655	0.463	0.463	0.1185
71	1.753	1.753	0.419	0.419	0.1072
72	1.858	1.858	0.384	0.384	9.829e-002
73	1.968	1.968	0.345	0.345	8.83e-002
74	2.085	2.085	0.308	0.308	7.883e-002
75	2.21	2.21	0.279	0.279	7.141e-002
76	2.341	2.341	0.25	0.25	6.399e-002
77	2.481	2.481	0.223	0.223	5.708e-002
78	2.63	2.63	0.198	0.198	5.068e-002
79	2.786	2.786	0.176	0.176	4.505e-002
80	2.953	2.953	0.157	0.157	4.018e-002
81	3.13	3.13	0.142	0.142	3.635e-002
82	3.316	3.316	0.125	0.125	3.199e-002
83	3.515	3.515	0.108	0.108	2.764e-002
84	3.725	3.725	9.6e-002	9.6e-002	2.457e-002
85	3.946	3.946	8.8e-002	8.8e-002	2.252e-002
86	4.181	4.181	7.8e-002	7.8e-002	1.996e-002
87	4.43	4.43	6.6e-002	6.6e-002	1.689e-002
88	4.693	4.693	5.9e-002	5.9e-002	1.51e-002
89	4.973	4.973	5.1e-002	5.1e-002	1.305e-002
90	5.27	5.27	4.4e-002	4.4e-002	1.126e-002
91	5.583	5.583	4.4e-002	4.4e-002	1.126e-002
92	5.915	5.915	3.4e-002	3.4e-002	8.702e-003
93	6.266	6.266	3.4e-002	3.4e-002	8.702e-003
94	6.64	6.64	2.9e-002	2.9e-002	7.423e-003
95	7.035	7.035	2.2e-002	2.2e-002	5.631e-003
96	7.453	7.453	2.4e-002	2.4e-002	6.143e-003
97	7.896	7.896	2.2e-002	2.2e-002	5.631e-003
98	8.366	8.366	1.9e-002	1.9e-002	4.863e-003
99	8.865	8.865	2.2e-002	2.2e-002	5.631e-003
100	9.391	9.391	1.7e-002	1.7e-002	4.351e-003
101	9.95	9.95	1.2e-002	1.2e-002	3.071e-003

102	10.54	10.54	7.e-003	7.e-003	1.792e-003
103	11.17	11.17	1.e-002	1.e-002	2.56e-003
104	11.83	11.83	1.e-002	1.e-002	2.56e-003
105	12.53	12.53	1.e-002	1.e-002	2.56e-003
106	13.28	13.28	1.e-002	1.e-002	2.56e-003
107	14.07	14.07	2.2e-002	2.2e-002	5.631e-003
108	14.91	14.91	7.e-003	7.e-003	1.792e-003
109	15.79	15.79	7.e-003	7.e-003	1.792e-003
110	16.73	16.73	2.e-003	2.e-003	5.119e-004
111	17.72	17.72	5.e-003	5.e-003	1.28e-003
112	18.78	18.78	2.e-003	2.e-003	5.119e-004
113	19.89	19.89	0.	0.	0.
114	21.07	21.07	0.	0.	0.
115	22.32	22.32	0.	0.	0.
116	23.65	23.65	-5.e-003	-5.e-003	-1.28e-003
117	25.05	25.05	0.	0.	0.

Rising Head Test

Site Name:	Fort McClellan
Location:	Parcel 94 (7)
Test Date:	11/27/01
Import File:	C:\Documents and Settings\jli\My Documents\Projects\FTMC\94mw5ar.txt

Well Label:	FTA-94-MW05
Aquifer Thickness:	12.8 feet
Screen Length:	15. feet
Casing Radius:	1. inches
Effective Radius:	4. inches
Gravel Pack Porosity:	30. %
Corrected Casing Radius:	2.345 inches
Static Water Level:	0. feet
Water Table to Screen Bottom:	12.8 feet
Anisotropy Ratio:	1.
Time Adjustment:	26.68 Seconds

Test starts with trial 0
There are 56 time and drawdown measurements
Maximum head is 0.201 feet
Minimum head is -2.5e-002 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.4447	0.	0.201	0.201	1.
2	0.4697	2.5e-002	0.187	0.187	0.9303
3	0.4963	5.16e-002	0.175	0.175	0.8706
4	0.5247	8.e-002	0.165	0.165	0.8209
5	0.5547	0.11	0.153	0.153	0.7612
6	0.5863	0.1416	0.145	0.145	0.7214
7	0.6213	0.1766	0.137	0.137	0.6816
8	0.6578	0.2131	0.129	0.129	0.6418
9	0.6963	0.2516	0.121	0.121	0.602
10	0.738	0.2933	0.113	0.113	0.5622
11	0.7813	0.3366	0.105	0.105	0.5224
12	0.828	0.3833	9.9e-002	9.9e-002	0.4925
13	0.8763	0.4316	9.3e-002	9.3e-002	0.4627
14	0.928	0.4833	8.7e-002	8.7e-002	0.4328
15	0.983	0.5383	8.1e-002	8.1e-002	0.403
16	1.041	0.5966	7.5e-002	7.5e-002	0.3731
17	1.103	0.6583	6.9e-002	6.9e-002	0.3433

18	1.168	0.7233	6.3e-002	6.3e-002	0.3134
19	1.238	0.7933	5.9e-002	5.9e-002	0.2935
20	1.311	0.8666	5.3e-002	5.3e-002	0.2637
21	1.39	0.945	4.9e-002	4.9e-002	0.2438
22	1.473	1.028	4.5e-002	4.5e-002	0.2239
23	1.561	1.117	4.1e-002	4.1e-002	0.204
24	1.655	1.21	3.5e-002	3.5e-002	0.1741
25	1.753	1.308	3.3e-002	3.3e-002	0.1642
26	1.858	1.413	2.9e-002	2.9e-002	0.1443
27	1.968	1.523	2.3e-002	2.3e-002	0.1144
28	2.085	1.64	2.1e-002	2.1e-002	0.1045
29	2.21	1.765	1.7e-002	1.7e-002	8.458e-002
30	2.341	1.897	1.5e-002	1.5e-002	7.463e-002
31	2.481	2.037	1.3e-002	1.3e-002	6.468e-002
32	2.63	2.185	9.e-003	9.e-003	4.478e-002
33	2.786	2.342	5.e-003	5.e-003	2.488e-002
34	2.953	2.508	3.e-003	3.e-003	1.493e-002
35	3.13	2.685	-1.e-003	-1.e-003	-4.975e-003
36	3.316	2.872	-3.e-003	-3.e-003	-1.493e-002
37	3.515	3.07	-5.e-003	-5.e-003	-2.488e-002
38	3.725	3.28	-7.e-003	-7.e-003	-3.483e-002
39	3.946	3.502	-5.e-003	-5.e-003	-2.488e-002
40	4.181	3.737	-7.e-003	-7.e-003	-3.483e-002
41	4.43	3.985	-9.e-003	-9.e-003	-4.478e-002
42	4.693	4.248	-9.e-003	-9.e-003	-4.478e-002
43	4.973	4.528	-1.1e-002	-1.1e-002	-5.473e-002
44	5.27	4.825	-1.1e-002	-1.1e-002	-5.473e-002
45	5.583	5.138	-1.3e-002	-1.3e-002	-6.468e-002
46	5.915	5.47	-1.5e-002	-1.5e-002	-7.463e-002
47	6.266	5.822	-1.5e-002	-1.5e-002	-7.463e-002
48	6.64	6.195	-1.9e-002	-1.9e-002	-9.453e-002
49	7.035	6.59	-1.9e-002	-1.9e-002	-9.453e-002
50	7.453	7.008	-1.9e-002	-1.9e-002	-9.453e-002
51	7.896	7.452	-1.9e-002	-1.9e-002	-9.453e-002
52	8.366	7.922	-2.1e-002	-2.1e-002	-0.1045
53	8.865	8.42	-2.3e-002	-2.3e-002	-0.1144
54	9.391	8.947	-2.3e-002	-2.3e-002	-0.1144
55	9.95	9.505	-2.3e-002	-2.3e-002	-0.1144
56	10.54	10.1	-2.5e-002	-2.5e-002	-0.1244

Falling Head Test

Site Name:	Fort McClellan
Location:	Parcel 94 (7)
Test Date:	11/26/01
Import File:	C:\Documents and Settings\jli\My Documents\Projects\FTMA\94mw11f.txt

Well Label:	FTA-94-MW11
Aquifer Thickness:	44.75 feet
Screen Length:	10. feet
Casing Radius:	2. inches
Effective Radius:	3.94 inches
Static Water Level:	0. feet
Water Table to Screen Bottom:	44.75 feet
Anisotropy Ratio:	1.
Time Adjustment:	0.6 Seconds

Test starts with trial 2
There are 117 time and drawdown measurements
Maximum head is 10.06 feet
Minimum head is -1.731 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-1.e-002	-2.e-003	2.e-003	1.988e-004
2	5.e-003	-5.e-003	-9.e-003	9.e-003	8.946e-004
3	1.e-002	0.	-10.06	10.06	1.
4	1.5e-002	5.e-003	-1.391	1.391	0.1383
5	2.e-002	1.e-002	1.731	-1.731	-0.1721
6	2.5e-002	1.5e-002	-2.088	2.088	0.2076
7	3.e-002	2.e-002	-1.584	1.584	0.1575
8	3.5e-002	2.5e-002	-1.357	1.357	0.1349
9	4.e-002	3.e-002	-1.494	1.494	0.1485
10	4.5e-002	3.5e-002	-1.545	1.545	0.1536
11	5.e-002	4.e-002	1.3e-002	-1.3e-002	-1.292e-003
12	5.5e-002	4.5e-002	-1.506	1.506	0.1497
13	6.e-002	5.e-002	-1.503	1.503	0.1494
14	6.5e-002	5.5e-002	-0.855	0.855	8.499e-002
15	7.e-002	6.e-002	-1.303	1.303	0.1295
16	7.5e-002	6.5e-002	-1.237	1.237	0.123
17	8.e-002	7.e-002	-1.097	1.097	0.109
18	8.48e-002	7.48e-002	-1.241	1.241	0.1234
19	9.e-002	8.e-002	-1.156	1.156	0.1149

20	9.5e-002	8.5e-002	-1.2	1.2	0.1193
21	0.1	9.e-002	-1.136	1.136	0.1129
22	0.1058	9.58e-002	-1.168	1.168	0.1161
23	0.112	0.102	-1.205	1.205	0.1198
24	0.1185	0.1085	-1.134	1.134	0.1127
25	0.1255	0.1155	-1.158	1.158	0.1151
26	0.1328	0.1228	-1.205	1.205	0.1198
27	0.1407	0.1307	-1.161	1.161	0.1154
28	0.149	0.139	-1.163	1.163	0.1156
29	0.1578	0.1478	-1.205	1.205	0.1198
30	0.167	0.157	-1.151	1.151	0.1144
31	0.177	0.167	-1.175	1.175	0.1168
32	0.1875	0.1775	-1.161	1.161	0.1154
33	0.1985	0.1885	-1.156	1.156	0.1149
34	0.2102	0.2002	-1.161	1.161	0.1154
35	0.2227	0.2127	-1.158	1.158	0.1151
36	0.2358	0.2258	-1.158	1.158	0.1151
37	0.2498	0.2398	-1.156	1.156	0.1149
38	0.2647	0.2547	-1.146	1.146	0.1139
39	0.2803	0.2703	-1.151	1.151	0.1144
40	0.297	0.287	-1.149	1.149	0.1142
41	0.3147	0.3047	-1.244	1.244	0.1237
42	0.3333	0.3233	-1.166	1.166	0.1159
43	0.3532	0.3432	-1.136	1.136	0.1129
44	0.3742	0.3642	-1.139	1.139	0.1132
45	0.3963	0.3863	-1.129	1.129	0.1122
46	0.4198	0.4098	-1.122	1.122	0.1115
47	0.4447	0.4347	-1.117	1.117	0.111
48	0.4697	0.4597	-1.112	1.112	0.1105
49	0.4963	0.4863	-1.105	1.105	0.1098
50	0.5247	0.5147	-1.1	1.1	0.1093
51	0.5547	0.5447	-1.09	1.09	0.1083
52	0.5863	0.5763	-1.078	1.078	0.1072
53	0.6213	0.6113	-1.073	1.073	0.1067
54	0.6578	0.6478	-1.071	1.071	0.1065
55	0.6963	0.6863	-1.056	1.056	0.105
56	0.738	0.728	-1.049	1.049	0.1043
57	0.7813	0.7713	-1.041	1.041	0.1035
58	0.828	0.818	-1.029	1.029	0.1023
59	0.8763	0.8663	-1.017	1.017	0.1011
60	0.928	0.918	-1.009	1.009	0.1003

61	0.983	0.973	-0.995	0.995	9.891e-002
62	1.041	1.031	-0.98	0.98	9.742e-002
63	1.103	1.093	-0.973	0.973	9.672e-002
64	1.168	1.158	-0.956	0.956	9.503e-002
65	1.238	1.228	-0.943	0.943	9.374e-002
66	1.311	1.301	-0.926	0.926	9.205e-002
67	1.39	1.38	-0.909	0.909	9.036e-002
68	1.473	1.463	-0.895	0.895	8.897e-002
69	1.561	1.551	-0.875	0.875	8.698e-002
70	1.655	1.645	-0.858	0.858	8.529e-002
71	1.753	1.743	-0.841	0.841	8.36e-002
72	1.858	1.848	-0.824	0.824	8.191e-002
73	1.968	1.958	-0.804	0.804	7.992e-002
74	2.085	2.075	-0.785	0.785	7.803e-002
75	2.21	2.2	-0.76	0.76	7.555e-002
76	2.341	2.331	-0.741	0.741	7.366e-002
77	2.481	2.471	-0.716	0.716	7.117e-002
78	2.63	2.62	-0.694	0.694	6.899e-002
79	2.786	2.776	-0.67	0.67	6.66e-002
80	2.953	2.943	-0.645	0.645	6.412e-002
81	3.13	3.12	-0.623	0.623	6.193e-002
82	3.316	3.306	-0.596	0.596	5.924e-002
83	3.515	3.505	-0.572	0.572	5.686e-002
84	3.725	3.715	-0.545	0.545	5.417e-002
85	3.946	3.936	-0.518	0.518	5.149e-002
86	4.181	4.171	-0.491	0.491	4.881e-002
87	4.43	4.42	-0.467	0.467	4.642e-002
88	4.693	4.683	-0.437	0.437	4.344e-002
89	4.973	4.963	-0.408	0.408	4.056e-002
90	5.27	5.26	-0.384	0.384	3.817e-002
91	5.583	5.573	-0.357	0.357	3.549e-002
92	5.915	5.905	-0.33	0.33	3.28e-002
93	6.266	6.256	-0.308	0.308	3.062e-002
94	6.64	6.63	-0.281	0.281	2.793e-002
95	7.035	7.025	-0.256	0.256	2.545e-002
96	7.453	7.443	-0.234	0.234	2.326e-002
97	7.896	7.886	-0.21	0.21	2.087e-002
98	8.366	8.356	-0.188	0.188	1.869e-002
99	8.865	8.855	-0.169	0.169	1.68e-002
100	9.391	9.381	-0.149	0.149	1.481e-002
101	9.95	9.94	-0.137	0.137	1.362e-002

102	10.54	10.53	-0.117	0.117	1.163e-002
103	11.17	11.16	-9.8e-002	9.8e-002	9.742e-003
104	11.83	11.82	-8.5e-002	8.5e-002	8.449e-003
105	12.53	12.52	-7.8e-002	7.8e-002	7.753e-003
106	13.28	13.27	-5.8e-002	5.8e-002	5.765e-003
107	14.07	14.06	-4.4e-002	4.4e-002	4.374e-003
108	14.91	14.9	-4.4e-002	4.4e-002	4.374e-003
109	15.79	15.78	-3.2e-002	3.2e-002	3.181e-003
110	16.73	16.72	-2.7e-002	2.7e-002	2.684e-003
111	17.72	17.71	-1.9e-002	1.9e-002	1.889e-003
112	18.78	18.77	-1.7e-002	1.7e-002	1.69e-003
113	19.89	19.88	-1.2e-002	1.2e-002	1.193e-003
114	21.07	21.06	-1.e-002	1.e-002	9.94e-004
115	22.32	22.31	-5.e-003	5.e-003	4.97e-004
116	23.65	23.64	-2.e-003	2.e-003	1.988e-004
117	25.05	25.04	0.	0.	0.

Rising Test

Site Name:	Fort McClellan
Location:	Parcel 94 (7)
Test Date:	11/26/01
Import File:	C:\Documents and Settings\jli\My Documents\Projects\FTMA\94mw11r.txt

Well Label:	FTA-94-MW11
Aquifer Thickness:	44.75 feet
Screen Length:	10. feet
Casing Radius:	2. inches
Effective Radius:	3.94 inches
Static Water Level:	0. feet
Water Table to Screen Bottom:	44.75 feet
Anisotropy Ratio:	1.
Time Adjustment:	2.4 Seconds

Test starts with trial 8
There are 119 time and drawdown measurements
Maximum head is 1.275 feet
Minimum head is 0. feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-4.e-002	0.609	0.609	0.4776
2	5.e-003	-3.5e-002	0.599	0.599	0.4698
3	1.e-002	-3.e-002	0.	0.	0.
4	1.5e-002	-2.5e-002	0.46	0.46	0.3608
5	2.e-002	-2.e-002	0.835	0.835	0.6549
6	2.5e-002	-1.5e-002	0.644	0.644	0.5051
7	3.e-002	-1.e-002	0.935	0.935	0.7333
8	3.5e-002	-5.e-003	1.138	1.138	0.8925
9	4.e-002	0.	1.275	1.275	1.
10	4.5e-002	5.e-003	1.258	1.258	0.9867
11	5.e-002	1.e-002	1.248	1.248	0.9788
12	5.5e-002	1.5e-002	1.243	1.243	0.9749
13	6.e-002	2.e-002	1.241	1.241	0.9733
14	6.5e-002	2.5e-002	1.253	1.253	0.9827
15	7.e-002	3.e-002	1.241	1.241	0.9733
16	7.5e-002	3.5e-002	1.241	1.241	0.9733
17	8.e-002	4.e-002	1.236	1.236	0.9694
18	8.48e-002	4.48e-002	1.234	1.234	0.9678
19	9.e-002	5.e-002	1.239	1.239	0.9718

20	9.5e-002	5.5e-002	1.231	1.231	0.9655
21	0.1	6.e-002	1.234	1.234	0.9678
22	0.1058	6.58e-002	1.231	1.231	0.9655
23	0.112	7.2e-002	1.226	1.226	0.9616
24	0.1185	7.85e-002	1.224	1.224	0.96
25	0.1255	8.55e-002	1.219	1.219	0.9561
26	0.1328	9.28e-002	1.219	1.219	0.9561
27	0.1407	0.1007	1.214	1.214	0.9522
28	0.149	0.109	1.209	1.209	0.9482
29	0.1578	0.1178	1.202	1.202	0.9427
30	0.167	0.127	1.204	1.204	0.9443
31	0.177	0.137	1.2	1.2	0.9412
32	0.1875	0.1475	1.197	1.197	0.9388
33	0.1985	0.1585	1.194	1.194	0.9365
34	0.2102	0.1702	1.19	1.19	0.9333
35	0.2227	0.1827	1.177	1.177	0.9231
36	0.2358	0.1958	1.18	1.18	0.9255
37	0.2498	0.2098	1.177	1.177	0.9231
38	0.2647	0.2247	1.17	1.17	0.9176
39	0.2803	0.2403	1.17	1.17	0.9176
40	0.297	0.257	1.168	1.168	0.9161
41	0.3147	0.2747	1.163	1.163	0.9122
42	0.3333	0.2933	1.16	1.16	0.9098
43	0.3532	0.3132	1.145	1.145	0.898
44	0.3742	0.3342	1.143	1.143	0.8965
45	0.3963	0.3563	1.141	1.141	0.8949
46	0.4198	0.3798	1.131	1.131	0.8871
47	0.4447	0.4047	1.121	1.121	0.8792
48	0.4697	0.4297	1.119	1.119	0.8776
49	0.4963	0.4563	1.113	1.113	0.8729
50	0.5247	0.4847	1.106	1.106	0.8675
51	0.5547	0.5147	1.091	1.091	0.8557
52	0.5863	0.5463	1.091	1.091	0.8557
53	0.6213	0.5813	1.082	1.082	0.8486
54	0.6578	0.6178	1.067	1.067	0.8369
55	0.6963	0.6563	1.067	1.067	0.8369
56	0.738	0.698	1.055	1.055	0.8275
57	0.7813	0.7413	1.045	1.045	0.8196
58	0.828	0.788	1.035	1.035	0.8118
59	0.8763	0.8363	1.023	1.023	0.8024
60	0.928	0.888	1.011	1.011	0.7929

61	0.983	0.943	0.998	0.998	0.7827
62	1.041	1.001	0.984	0.984	0.7718
63	1.103	1.063	0.972	0.972	0.7624
64	1.168	1.128	0.962	0.962	0.7545
65	1.238	1.198	0.942	0.942	0.7388
66	1.311	1.271	0.928	0.928	0.7278
67	1.39	1.35	0.913	0.913	0.7161
68	1.473	1.433	0.896	0.896	0.7027
69	1.561	1.521	0.881	0.881	0.691
70	1.655	1.615	0.864	0.864	0.6776
71	1.753	1.713	0.844	0.844	0.662
72	1.858	1.818	0.827	0.827	0.6486
73	1.968	1.928	0.807	0.807	0.6329
74	2.085	2.045	0.788	0.788	0.618
75	2.21	2.17	0.763	0.763	0.5984
76	2.341	2.301	0.741	0.741	0.5812
77	2.481	2.441	0.722	0.722	0.5663
78	2.63	2.59	0.695	0.695	0.5451
79	2.786	2.746	0.675	0.675	0.5294
80	2.953	2.913	0.651	0.651	0.5106
81	3.13	3.09	0.629	0.629	0.4933
82	3.316	3.276	0.602	0.602	0.4722
83	3.515	3.475	0.575	0.575	0.451
84	3.725	3.685	0.551	0.551	0.4322
85	3.946	3.906	0.524	0.524	0.411
86	4.181	4.141	0.497	0.497	0.3898
87	4.43	4.39	0.472	0.472	0.3702
88	4.693	4.653	0.445	0.445	0.349
89	4.973	4.933	0.416	0.416	0.3263
90	5.27	5.23	0.389	0.389	0.3051
91	5.583	5.543	0.365	0.365	0.2863
92	5.915	5.875	0.338	0.338	0.2651
93	6.266	6.226	0.313	0.313	0.2455
94	6.64	6.6	0.286	0.286	0.2243
95	7.035	6.995	0.257	0.257	0.2016
96	7.453	7.413	0.237	0.237	0.1859
97	7.896	7.856	0.218	0.218	0.171
98	8.366	8.326	0.196	0.196	0.1537
99	8.865	8.825	0.171	0.171	0.1341
100	9.391	9.351	0.154	0.154	0.1208
101	9.95	9.91	0.134	0.134	0.1051

102	10.54	10.5	0.117	0.117	9.176e-002
103	11.17	11.13	0.1	0.1	7.843e-002
104	11.83	11.79	8.5e-002	8.5e-002	6.667e-002
105	12.53	12.49	7.1e-002	7.1e-002	5.569e-002
106	13.28	13.24	6.3e-002	6.3e-002	4.941e-002
107	14.07	14.03	5.1e-002	5.1e-002	4.e-002
108	14.91	14.87	3.9e-002	3.9e-002	3.059e-002
109	15.79	15.75	3.4e-002	3.4e-002	2.667e-002
110	16.73	16.69	2.9e-002	2.9e-002	2.275e-002
111	17.72	17.68	1.5e-002	1.5e-002	1.176e-002
112	18.78	18.74	1.5e-002	1.5e-002	1.176e-002
113	19.89	19.85	7.e-003	7.e-003	5.49e-003
114	21.07	21.03	5.e-003	5.e-003	3.922e-003
115	22.32	22.28	5.e-003	5.e-003	3.922e-003
116	23.65	23.61	1.9e-002	1.9e-002	1.49e-002
117	25.05	25.01	1.9e-002	1.9e-002	1.49e-002
118	26.54	26.5	1.2e-002	1.2e-002	9.412e-003
119	28.12	28.08	0.	0.	0.

Falling Head Test

Site Name:	Fort McClellan
Location:	Parcel 94 (7)
Test Date:	11/26/01
Import File:	C:\Documents and Settings\jli\My Documents\Projects\FTMA\94mw12f.txt

Well Label:	FTA-94-MW12
Aquifer Thickness:	87.05 feet
Screen Length:	10. feet
Casing Radius:	1. inches
Effective Radius:	3.125 inches
Static Water Level:	0. feet
Water Table to Screen Bottom:	87.05 feet
Anisotropy Ratio:	1.
Time Adjustment:	2.1 Seconds

Test starts with trial 7
There are 171 time and drawdown measurements
Maximum head is 4.466 feet
Minimum head is -9.4 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-3.5e-002	-2.453	2.453	0.5493
2	5.e-003	-3.e-002	9.4	-9.4	-2.105
3	1.e-002	-2.5e-002	-0.178	0.178	3.986e-002
4	1.5e-002	-2.e-002	0.949	-0.949	-0.2125
5	2.e-002	-1.5e-002	-0.254	0.254	5.687e-002
6	2.5e-002	-1.e-002	-0.688	0.688	0.1541
7	3.e-002	-5.e-003	-3.315	3.315	0.7423
8	3.5e-002	0.	-4.466	4.466	1.
9	4.e-002	5.e-003	-3.974	3.974	0.8898
10	4.5e-002	1.e-002	-3.587	3.587	0.8032
11	5.e-002	1.5e-002	-2.492	2.492	0.558
12	5.5e-002	2.e-002	-3.417	3.417	0.7651
13	6.e-002	2.5e-002	-3.521	3.521	0.7884
14	6.5e-002	3.e-002	-3.643	3.643	0.8157
15	7.e-002	3.5e-002	-3.595	3.595	0.805
16	7.5e-002	4.e-002	-3.221	3.221	0.7212
17	8.e-002	4.5e-002	-2.871	2.871	0.6429
18	8.48e-002	4.98e-002	1.033	-1.033	-0.2313
19	9.e-002	5.5e-002	-2.068	2.068	0.4631

20	9.5e-002	6.e-002	-2.092	2.092	0.4684
21	0.1	6.5e-002	-1.543	1.543	0.3455
22	0.1058	7.08e-002	-2.12	2.12	0.4747
23	0.112	7.7e-002	-2.214	2.214	0.4957
24	0.1185	8.35e-002	-1.529	1.529	0.3424
25	0.1255	9.05e-002	-1.768	1.768	0.3959
26	0.1328	9.78e-002	-1.75	1.75	0.3918
27	0.1407	0.1057	-1.735	1.735	0.3885
28	0.149	0.114	-1.739	1.739	0.3894
29	0.1578	0.1228	-1.736	1.736	0.3887
30	0.167	0.132	-1.729	1.729	0.3871
31	0.177	0.142	-1.727	1.727	0.3867
32	0.1875	0.1525	-1.725	1.725	0.3863
33	0.1985	0.1635	-1.725	1.725	0.3863
34	0.2102	0.1752	-1.723	1.723	0.3858
35	0.2227	0.1877	-1.723	1.723	0.3858
36	0.2358	0.2008	-1.697	1.697	0.38
37	0.2498	0.2148	-1.719	1.719	0.3849
38	0.2647	0.2297	-1.719	1.719	0.3849
39	0.2803	0.2453	-1.719	1.719	0.3849
40	0.297	0.262	-1.719	1.719	0.3849
41	0.3147	0.2797	-1.717	1.717	0.3845
42	0.3333	0.2983	-1.717	1.717	0.3845
43	0.3532	0.3182	-1.715	1.715	0.384
44	0.3742	0.3392	-1.717	1.717	0.3845
45	0.3963	0.3613	-1.715	1.715	0.384
46	0.4198	0.3848	-1.715	1.715	0.384
47	0.4447	0.4097	-1.715	1.715	0.384
48	0.4697	0.4347	-1.713	1.713	0.3836
49	0.4963	0.4613	-1.713	1.713	0.3836
50	0.5247	0.4897	-1.711	1.711	0.3831
51	0.5547	0.5197	-1.711	1.711	0.3831
52	0.5863	0.5513	-1.711	1.711	0.3831
53	0.6213	0.5863	-1.709	1.709	0.3827
54	0.6578	0.6228	-1.709	1.709	0.3827
55	0.6963	0.6613	-1.709	1.709	0.3827
56	0.738	0.703	-1.707	1.707	0.3822
57	0.7813	0.7463	-1.709	1.709	0.3827
58	0.828	0.793	-1.709	1.709	0.3827
59	0.8763	0.8413	-1.707	1.707	0.3822
60	0.928	0.893	-1.707	1.707	0.3822

61	0.983	0.948	-1.705	1.705	0.3818
62	1.041	1.006	-1.705	1.705	0.3818
63	1.103	1.068	-1.705	1.705	0.3818
64	1.168	1.133	-1.705	1.705	0.3818
65	1.238	1.203	-1.705	1.705	0.3818
66	1.311	1.276	-1.703	1.703	0.3813
67	1.39	1.355	-1.703	1.703	0.3813
68	1.473	1.438	-1.703	1.703	0.3813
69	1.561	1.526	-1.701	1.701	0.3809
70	1.655	1.62	-1.701	1.701	0.3809
71	1.753	1.718	-1.701	1.701	0.3809
72	1.858	1.823	-1.699	1.699	0.3804
73	1.968	1.933	-1.697	1.697	0.38
74	2.085	2.05	-1.697	1.697	0.38
75	2.21	2.175	-1.695	1.695	0.3795
76	2.341	2.306	-1.695	1.695	0.3795
77	2.481	2.446	-1.694	1.694	0.3793
78	2.63	2.595	-1.694	1.694	0.3793
79	2.786	2.751	-1.692	1.692	0.3789
80	2.953	2.918	-1.692	1.692	0.3789
81	3.13	3.095	-1.692	1.692	0.3789
82	3.316	3.281	-1.689	1.689	0.3782
83	3.515	3.48	-1.687	1.687	0.3777
84	3.725	3.69	-1.685	1.685	0.3773
85	3.946	3.911	-1.683	1.683	0.3768
86	4.181	4.146	-1.683	1.683	0.3768
87	4.43	4.394	-1.679	1.679	0.376
88	4.693	4.658	-1.679	1.679	0.376
89	4.973	4.938	-1.677	1.677	0.3755
90	5.27	5.235	-1.675	1.675	0.3751
91	5.583	5.548	-1.673	1.673	0.3746
92	5.915	5.88	-1.671	1.671	0.3742
93	6.266	6.231	-1.669	1.669	0.3737
94	6.64	6.605	-1.667	1.667	0.3733
95	7.035	7.	-1.663	1.663	0.3724
96	7.453	7.418	-1.661	1.661	0.3719
97	7.896	7.861	-1.657	1.657	0.371
98	8.366	8.331	-1.655	1.655	0.3706
99	8.865	8.83	-1.651	1.651	0.3697
100	9.391	9.356	-1.649	1.649	0.3692
101	9.95	9.915	-1.643	1.643	0.3679

102	10.54	10.51	-1.639	1.639	0.367
103	11.17	11.13	-1.638	1.638	0.3668
104	11.83	11.8	-1.634	1.634	0.3659
105	12.53	12.5	-1.63	1.63	0.365
106	13.28	13.24	-1.624	1.624	0.3636
107	14.07	14.03	-1.62	1.62	0.3627
108	14.91	14.87	-1.618	1.618	0.3623
109	15.79	15.76	-1.612	1.612	0.3609
110	16.73	16.69	-1.606	1.606	0.3596
111	17.72	17.69	-1.6	1.6	0.3583
112	18.78	18.74	-1.594	1.594	0.3569
113	19.89	19.86	-1.588	1.588	0.3556
114	21.07	21.04	-1.58	1.58	0.3538
115	22.32	22.29	-1.572	1.572	0.352
116	23.65	23.61	-1.564	1.564	0.3502
117	25.05	25.02	-1.558	1.558	0.3489
118	26.54	26.51	-1.548	1.548	0.3466
119	28.12	28.08	-1.538	1.538	0.3444
120	29.79	29.75	-1.528	1.528	0.3421
121	31.55	31.52	-1.518	1.518	0.3399
122	33.43	33.39	-1.506	1.506	0.3372
123	35.41	35.38	-1.496	1.496	0.335
124	37.51	37.48	-1.482	1.482	0.3318
125	39.74	39.7	-1.47	1.47	0.3292
126	42.1	42.06	-1.456	1.456	0.326
127	44.6	44.56	-1.442	1.442	0.3229
128	47.24	47.21	-1.426	1.426	0.3193
129	50.05	50.01	-1.41	1.41	0.3157
130	53.01	52.98	-1.394	1.394	0.3121
131	56.16	56.12	-1.376	1.376	0.3081
132	59.49	59.46	-1.358	1.358	0.3041
133	63.02	62.98	-1.338	1.338	0.2996
134	66.76	66.72	-1.317	1.317	0.2949
135	70.72	70.68	-1.295	1.295	0.29
136	74.91	74.88	-1.275	1.275	0.2855
137	79.35	79.32	-1.25	1.25	0.2799
138	84.06	84.03	-1.225	1.225	0.2743
139	89.05	89.01	-1.197	1.197	0.268
140	94.33	94.29	-1.171	1.171	0.2622
141	99.92	99.88	-1.141	1.141	0.2555
142	105.8	105.8	-1.111	1.111	0.2488

143	112.1	112.1	-1.079	1.079	0.2416
144	118.8	118.7	-1.045	1.045	0.234
145	125.8	125.8	-1.011	1.011	0.2264
146	133.3	133.2	-0.973	0.973	0.2179
147	141.2	141.1	-0.935	0.935	0.2094
148	149.5	149.5	-0.895	0.895	0.2004
149	158.4	158.4	-0.851	0.851	0.1906
150	167.8	167.8	-0.809	0.809	0.1811
151	177.7	177.7	-0.763	0.763	0.1708
152	188.3	188.2	-0.715	0.715	0.1601
153	198.3	198.2	-0.673	0.673	0.1507
154	208.3	208.2	-0.627	0.627	0.1404
155	218.3	218.2	-0.585	0.585	0.131
156	228.3	228.2	-0.545	0.545	0.122
157	238.3	238.2	-0.502	0.502	0.1124
158	248.3	248.2	-0.461	0.461	0.1032
159	258.3	258.2	-0.421	0.421	9.427e-002
160	268.3	268.2	-0.383	0.383	8.576e-002
161	278.3	278.2	-0.345	0.345	7.725e-002
162	288.3	288.2	-0.308	0.308	6.897e-002
163	298.3	298.2	-0.272	0.272	6.09e-002
164	308.3	308.2	-0.236	0.236	5.284e-002
165	318.3	318.2	-0.2	0.2	4.478e-002
166	328.3	328.2	-0.166	0.166	3.717e-002
167	338.3	338.2	-0.13	0.13	2.911e-002
168	348.3	348.2	-9.6e-002	9.6e-002	2.15e-002
169	358.3	358.2	-6.4e-002	6.4e-002	1.433e-002
170	368.3	368.2	-3.e-002	3.e-002	6.717e-003
171	378.3	378.2	0.	0.	0.

Rising Head Test

Site Name:	Parcel 94 (7)
Location:	FTA-94-MW12
Test Date:	11/26/01
Import File:	C:\Documents and Settings\jli\My Documents\Projects\FTMA\94mw12r.txt

Well Label:	FTA-94-MW12
Aquifer Thickness:	87.05 feet
Screen Length:	10. feet
Casing Radius:	1. inches
Effective Radius:	3.125 inches
Static Water Level:	0. feet
Water Table to Screen Bottom:	87.05 feet
Anisotropy Ratio:	1.
Time Adjustment:	2.7 Seconds

Test starts with trial 9
There are 216 time and drawdown measurements
Maximum head is 0.777 feet
Minimum head is -1.738 feet

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (feet)	Head (feet)	Head Ratio
1	0.	-4.5e-002	-1.738	-1.738	-2.237
2	5.e-003	-4.e-002	-0.832	-0.832	-1.071
3	1.e-002	-3.5e-002	0.353	0.353	0.4543
4	1.5e-002	-3.e-002	-0.828	-0.828	-1.066
5	2.e-002	-2.5e-002	-1.004	-1.004	-1.292
6	2.5e-002	-2.e-002	0.365	0.365	0.4698
7	3.e-002	-1.5e-002	0.595	0.595	0.7658
8	3.5e-002	-1.e-002	0.769	0.769	0.9897
9	4.e-002	-5.e-003	0.659	0.659	0.8481
10	4.5e-002	0.	0.777	0.777	1.
11	5.e-002	5.e-003	0.713	0.713	0.9176
12	5.5e-002	1.e-002	0.713	0.713	0.9176
13	6.e-002	1.5e-002	0.695	0.695	0.8945
14	6.5e-002	2.e-002	0.685	0.685	0.8816
15	7.e-002	2.5e-002	0.675	0.675	0.8687
16	7.5e-002	3.e-002	0.665	0.665	0.8559
17	8.e-002	3.5e-002	0.659	0.659	0.8481
18	8.48e-002	3.98e-002	0.653	0.653	0.8404
19	9.e-002	4.5e-002	0.649	0.649	0.8353

20	9.5e-002	5.e-002	0.645	0.645	0.8301
21	0.1	5.5e-002	0.641	0.641	0.825
22	0.1058	6.08e-002	0.637	0.637	0.8198
23	0.112	6.7e-002	0.634	0.634	0.816
24	0.1185	7.35e-002	0.632	0.632	0.8134
25	0.1255	8.05e-002	0.628	0.628	0.8082
26	0.1328	8.78e-002	0.614	0.614	0.7902
27	0.1407	9.57e-002	0.622	0.622	0.8005
28	0.149	0.104	0.618	0.618	0.7954
29	0.1578	0.1128	0.614	0.614	0.7902
30	0.167	0.122	0.613	0.613	0.7889
31	0.177	0.132	0.609	0.609	0.7838
32	0.1875	0.1425	0.607	0.607	0.7812
33	0.1985	0.1535	0.603	0.603	0.7761
34	0.2102	0.1652	0.599	0.599	0.7709
35	0.2227	0.1777	0.597	0.597	0.7683
36	0.2358	0.1908	0.595	0.595	0.7658
37	0.2498	0.2048	0.593	0.593	0.7632
38	0.2647	0.2197	0.591	0.591	0.7606
39	0.2803	0.2353	0.589	0.589	0.758
40	0.297	0.252	0.587	0.587	0.7555
41	0.3147	0.2697	0.585	0.585	0.7529
42	0.3333	0.2883	0.583	0.583	0.7503
43	0.3532	0.3082	0.583	0.583	0.7503
44	0.3742	0.3292	0.579	0.579	0.7452
45	0.3963	0.3513	0.579	0.579	0.7452
46	0.4198	0.3748	0.579	0.579	0.7452
47	0.4447	0.3997	0.577	0.577	0.7426
48	0.4697	0.4247	0.577	0.577	0.7426
49	0.4963	0.4513	0.575	0.575	0.74
50	0.5247	0.4797	0.573	0.573	0.7375
51	0.5547	0.5097	0.573	0.573	0.7375
52	0.5863	0.5413	0.571	0.571	0.7349
53	0.6213	0.5763	0.571	0.571	0.7349
54	0.6578	0.6128	0.569	0.569	0.7323
55	0.6963	0.6513	0.569	0.569	0.7323
56	0.738	0.693	0.567	0.567	0.7297
57	0.7813	0.7363	0.567	0.567	0.7297
58	0.828	0.783	0.567	0.567	0.7297
59	0.8763	0.8313	0.565	0.565	0.7272
60	0.928	0.883	0.565	0.565	0.7272

61	0.983	0.938	0.563	0.563	0.7246
62	1.041	0.9963	0.563	0.563	0.7246
63	1.103	1.058	0.563	0.563	0.7246
64	1.168	1.123	0.562	0.562	0.7233
65	1.238	1.193	0.562	0.562	0.7233
66	1.311	1.266	0.56	0.56	0.7207
67	1.39	1.345	0.558	0.558	0.7181
68	1.473	1.428	0.558	0.558	0.7181
69	1.561	1.516	0.558	0.558	0.7181
70	1.655	1.61	0.558	0.558	0.7181
71	1.753	1.708	0.556	0.556	0.7156
72	1.858	1.813	0.558	0.558	0.7181
73	1.968	1.923	0.556	0.556	0.7156
74	2.085	2.04	0.554	0.554	0.713
75	2.21	2.165	0.554	0.554	0.713
76	2.341	2.296	0.554	0.554	0.713
77	2.481	2.436	0.554	0.554	0.713
78	2.63	2.585	0.552	0.552	0.7104
79	2.786	2.741	0.552	0.552	0.7104
80	2.953	2.908	0.552	0.552	0.7104
81	3.13	3.085	0.552	0.552	0.7104
82	3.316	3.271	0.55	0.55	0.7079
83	3.515	3.47	0.548	0.548	0.7053
84	3.725	3.68	0.548	0.548	0.7053
85	3.946	3.901	0.548	0.548	0.7053
86	4.181	4.136	0.548	0.548	0.7053
87	4.43	4.385	0.546	0.546	0.7027
88	4.693	4.648	0.546	0.546	0.7027
89	4.973	4.928	0.544	0.544	0.7001
90	5.27	5.225	0.544	0.544	0.7001
91	5.583	5.538	0.544	0.544	0.7001
92	5.915	5.87	0.542	0.542	0.6976
93	6.266	6.221	0.542	0.542	0.6976
94	6.64	6.595	0.54	0.54	0.695
95	7.035	6.99	0.54	0.54	0.695
96	7.453	7.408	0.54	0.54	0.695
97	7.896	7.851	0.538	0.538	0.6924
98	8.366	8.321	0.536	0.536	0.6898
99	8.865	8.82	0.536	0.536	0.6898
100	9.391	9.346	0.534	0.534	0.6873
101	9.95	9.905	0.534	0.534	0.6873

102	10.54	10.5	0.532	0.532	0.6847
103	11.17	11.12	0.532	0.532	0.6847
104	11.83	11.79	0.53	0.53	0.6821
105	12.53	12.49	0.528	0.528	0.6795
106	13.28	13.23	0.528	0.528	0.6795
107	14.07	14.02	0.526	0.526	0.677
108	14.91	14.86	0.524	0.524	0.6744
109	15.79	15.75	0.522	0.522	0.6718
110	16.73	16.68	0.522	0.522	0.6718
111	17.72	17.68	0.52	0.52	0.6692
112	18.78	18.73	0.518	0.518	0.6667
113	19.89	19.85	0.518	0.518	0.6667
114	21.07	21.03	0.516	0.516	0.6641
115	22.32	22.28	0.514	0.514	0.6615
116	23.65	23.6	0.512	0.512	0.6589
117	25.05	25.01	0.508	0.508	0.6538
118	26.54	26.5	0.506	0.506	0.6512
119	28.12	28.07	0.504	0.504	0.6486
120	29.79	29.74	0.502	0.502	0.6461
121	31.55	31.51	0.5	0.5	0.6435
122	33.43	33.38	0.498	0.498	0.6409
123	35.41	35.37	0.496	0.496	0.6384
124	37.51	37.47	0.492	0.492	0.6332
125	39.74	39.69	0.49	0.49	0.6306
126	42.1	42.05	0.488	0.488	0.6281
127	44.6	44.55	0.484	0.484	0.6229
128	47.24	47.2	0.482	0.482	0.6203
129	50.05	50.	0.478	0.478	0.6152
130	53.01	52.97	0.474	0.474	0.61
131	56.16	56.11	0.47	0.47	0.6049
132	59.49	59.45	0.466	0.466	0.5997
133	63.02	62.97	0.464	0.464	0.5972
134	66.76	66.71	0.458	0.458	0.5894
135	70.72	70.67	0.456	0.456	0.5869
136	74.91	74.87	0.45	0.45	0.5792
137	79.35	79.31	0.444	0.444	0.5714
138	84.06	84.02	0.44	0.44	0.5663
139	89.05	89.	0.434	0.434	0.5586
140	94.33	94.28	0.432	0.432	0.556
141	99.92	99.87	0.424	0.424	0.5457
142	105.8	105.8	0.42	0.42	0.5405

143	112.1	112.1	0.414	0.414	0.5328
144	118.8	118.7	0.406	0.406	0.5225
145	125.8	125.8	0.402	0.402	0.5174
146	133.3	133.2	0.392	0.392	0.5045
147	141.2	141.1	0.388	0.388	0.4994
148	149.5	149.5	0.38	0.38	0.4891
149	158.4	158.4	0.372	0.372	0.4788
150	167.8	167.7	0.366	0.366	0.471
151	177.7	177.7	0.358	0.358	0.4607
152	188.3	188.2	0.35	0.35	0.4505
153	198.3	198.2	0.342	0.342	0.4402
154	208.3	208.2	0.336	0.336	0.4324
155	218.3	218.2	0.328	0.328	0.4221
156	228.3	228.2	0.32	0.32	0.4118
157	238.3	238.2	0.314	0.314	0.4041
158	248.3	248.2	0.306	0.306	0.3938
159	258.3	258.2	0.298	0.298	0.3835
160	268.3	268.2	0.292	0.292	0.3758
161	278.3	278.2	0.284	0.284	0.3655
162	288.3	288.2	0.278	0.278	0.3578
163	298.3	298.2	0.27	0.27	0.3475
164	308.3	308.2	0.264	0.264	0.3398
165	318.3	318.2	0.26	0.26	0.3346
166	328.3	328.2	0.252	0.252	0.3243
167	338.3	338.2	0.244	0.244	0.314
168	348.3	348.2	0.24	0.24	0.3089
169	358.3	358.2	0.232	0.232	0.2986
170	368.3	368.2	0.228	0.228	0.2934
171	378.3	378.2	0.222	0.222	0.2857
172	388.3	388.2	0.214	0.214	0.2754
173	398.3	398.2	0.208	0.208	0.2677
174	408.3	408.2	0.202	0.202	0.26
175	418.3	418.2	0.196	0.196	0.2523
176	428.3	428.2	0.192	0.192	0.2471
177	438.3	438.2	0.184	0.184	0.2368
178	448.3	448.2	0.18	0.18	0.2317
179	458.3	458.2	0.174	0.174	0.2239
180	468.3	468.2	0.17	0.17	0.2188
181	478.3	478.2	0.164	0.164	0.2111
182	488.3	488.2	0.16	0.16	0.2059
183	498.3	498.2	0.154	0.154	0.1982

184	508.3	508.2	0.15	0.15	0.1931
185	518.3	518.2	0.142	0.142	0.1828
186	528.3	528.2	0.138	0.138	0.1776
187	538.3	538.2	0.132	0.132	0.1699
188	548.3	548.2	0.128	0.128	0.1647
189	558.3	558.2	0.122	0.122	0.157
190	568.3	568.2	0.116	0.116	0.1493
191	578.3	578.2	0.112	0.112	0.1441
192	588.3	588.2	0.106	0.106	0.1364
193	598.3	598.2	0.102	0.102	0.1313
194	608.3	608.2	9.8e-002	9.8e-002	0.1261
195	618.3	618.2	9.4e-002	9.4e-002	0.121
196	628.3	628.2	9.e-002	9.e-002	0.1158
197	638.3	638.2	8.4e-002	8.4e-002	0.1081
198	648.3	648.2	7.8e-002	7.8e-002	0.1004
199	658.3	658.2	7.4e-002	7.4e-002	9.524e-002
200	668.3	668.2	7.e-002	7.e-002	9.009e-002
201	678.3	678.2	6.4e-002	6.4e-002	8.237e-002
202	688.3	688.2	6.e-002	6.e-002	7.722e-002
203	698.3	698.2	5.6e-002	5.6e-002	7.207e-002
204	708.3	708.2	5.2e-002	5.2e-002	6.692e-002
205	718.3	718.2	4.8e-002	4.8e-002	6.178e-002
206	728.3	728.2	4.2e-002	4.2e-002	5.405e-002
207	738.3	738.2	3.6e-002	3.6e-002	4.633e-002
208	748.3	748.2	3.4e-002	3.4e-002	4.376e-002
209	758.3	758.2	2.8e-002	2.8e-002	3.604e-002
210	768.3	768.2	2.4e-002	2.4e-002	3.089e-002
211	778.3	778.2	2.e-002	2.e-002	2.574e-002
212	788.3	788.2	1.6e-002	1.6e-002	2.059e-002
213	798.3	798.2	1.2e-002	1.2e-002	1.544e-002
214	808.3	808.2	8.e-003	8.e-003	1.03e-002
215	818.3	818.2	4.e-003	4.e-003	5.148e-003
216	828.3	828.2	0.	0.	0.

FIELD ACTIVITY DAILY LOGS

IT CORPORATION
A Member of The IT Group

SLUG TEST FORM

DATE: 11/26/01

PROJECT NAME: FTMA	PROJECT No.: 796887
	COST CODE : 03020300

WELL No. : FTA - 94 - MW01	WELL LOCATION : MP1500

INITIAL MEASUREMENT (PRIOR TO THE TEST)

TIME	DTW (ft)	CASING DIAMETER (in)	TD (ft)
0946	26.55	4	44.60

FALLING TEST (SLUG IN)	TEST No. : 5	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1336	16.34						
1339	16.34						
1341	16.34						

TEST STARTED:	1342
TEST STOPPED:	1410

RISING TEST (SLUG OUT)	TEST No. : 6	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1411	16.36						

TEST STARTED:	1411
TEST STOPPED:	1428

NOTES: DTW — depth to water
TD — total epth
XD — trnsducer reading (ft above the probe)
Type equipment — In-Situ miniTROLL (0.72" OD)

PID 0.0 ppm
troll 1160

94mw 1A. bin
94 mw 1r. bin

IT CORPORATION
A Member of The IT Group

SLUG TEST FORM

DATE: 11/26/01

PROJECT NAME: FTMA	PROJECT No.: 746887
	COST CODE : C3020300

WELL No. : FTA-94-MW02	WELL LOCATION : MP 1500

INITIAL MEASUREMENT (PRIOR TO THE TEST)

TIME	DTW (ft)	CASING DIAMETER (in)	TD (ft)
0935	31.70	2	55.8

FALLING TEST (SLUG IN)	TEST No. : 1	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1052	17.46						
1055	17.46						
1100	17.46						
TEST STARTED:	1100						
TEST STOPPED:	1111						

RISING TEST (SLUG OUT)	TEST No. : 2	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1121	17.66						
1126	17.63						
1130	17.63						
TEST STARTED:	1130						
TEST STOPPED:	1256						

NOTES: DTW --- depth to water
TD --- total epth
XD --- trnsducer reading (ft above the probe)
Type equipment --- In-Situ miniTROLL (0.72" OD)

PID 0.0 ppm
troll 1160

94 mw 2f. bin
94 mw 2r. bin

IT CORPORATION
A Member of The IT Group

SLUG TEST FORM

DATE: 11/27/01

PROJECT NAME: FTMA	PROJECT No.: 796887
	COST CODE : 03020300

WELL No. : FTA-94-MW05	WELL LOCATION : MP 1500

INITIAL MEASUREMENT (PRIOR TO THE TEST)

TIME	DTW (ft)	CASING DIAMETER (in)	TD (ft)
1643	25.6	2 ~~2.4~~ (2.4)	38.4

FALLING TEST (SLUG IN)	TEST No. :	REF. =

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)

TEST STARTED:	
TEST STOPPED:	

RISING TEST (SLUG OUT)	TEST No. : 10	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1650	11.20						
1710	16.07						
1719	16.07						

TEST STARTED:	1719
TEST STOPPED:	0649 (11-28-01)

NOTES: DTW — depth to water
TD — total epth
XD — trnsducer reading (ft above the probe)
Type equipment — In-Situ miniTROLL (0.72" OD)

PID 0.0 ppm
Troll 4769

* WL within screen
∴ rising test only.

94 MW 5r. bin

IT CORPORATION
A Member of The IT Group

SLUG TEST FORM

DATE: 11 / 26 / 01

PROJECT NAME: FTMA	PROJECT No.: 79887
	COST CODE : 03020300

WELL No. : FTA - 94 - MW 11	WELL LOCATION : MP 1500

INITIAL MEASUREMENT (PRIOR TO THE TEST)

TIME	DTW (ft)	CASING DIAMETER (in)	TD (ft)
0942	25.95	4	70.7

FALLING TEST (SLUG IN)	TEST No. : 3	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1228	19.83						
1230	19.81						
1234	19.8						
1237	19.8						
TEST STARTED:	1238						
TEST STOPPED:	54 ~~1303~~ 1303						

RISING TEST (SLUG OUT)	TEST No. : 4	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1303	19.83						
TEST STARTED:	1304						
TEST STOPPED:	1333						

NOTES: DTW — depth to water
TD — total epth
XD — trnsducer reading (ft above the probe)
Type equipment — In-Situ miniTROLL (0.72" OD)

PID 0.0 ppm
troll 1160

94 mw 11 f. bin
94 mw 11 r. bin

IT CORPORATION
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SLUG TEST FORM

DATE: 11 / 26 / 01

PROJECT NAME: FTMA	PROJECT No.: 798887
	COST CODE : 03020300

WELL No. : FTA - 94 - MW 12	WELL LOCATION : MP 1500

INITIAL MEASUREMENT (PRIOR TO THE TEST)

TIME	DTW (ft) (btoc)	CASING DIAMETER (in)	TD (ft) (btoc)
0915	6.95	2	94.0

FALLING TEST (SLUG IN)	TEST No. : 1	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1031	22.4						
1038	22.4						
TEST STARTED:	1038						
TEST STOPPED:	1659						

RISING TEST (SLUG OUT)	TEST No. : 2	REF. = 0

TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)	TIME	(XD) (ft)
1659	24.87						
TEST STARTED:	1659						
TEST STOPPED:	0654	11-27-01					

NOTES: DTW ---- depth to water (btoc)
TD ---- total epth (btoc)
XD ---- trnsducer reading (ft above the probe)
Type equipment ---- In-Situ miniTROLL (0.72" OD)

PID 0.0 ppm

Probe 4769

94 mw 12 f.bin
94 mw 12 r.bin

ATTACHMENT 2

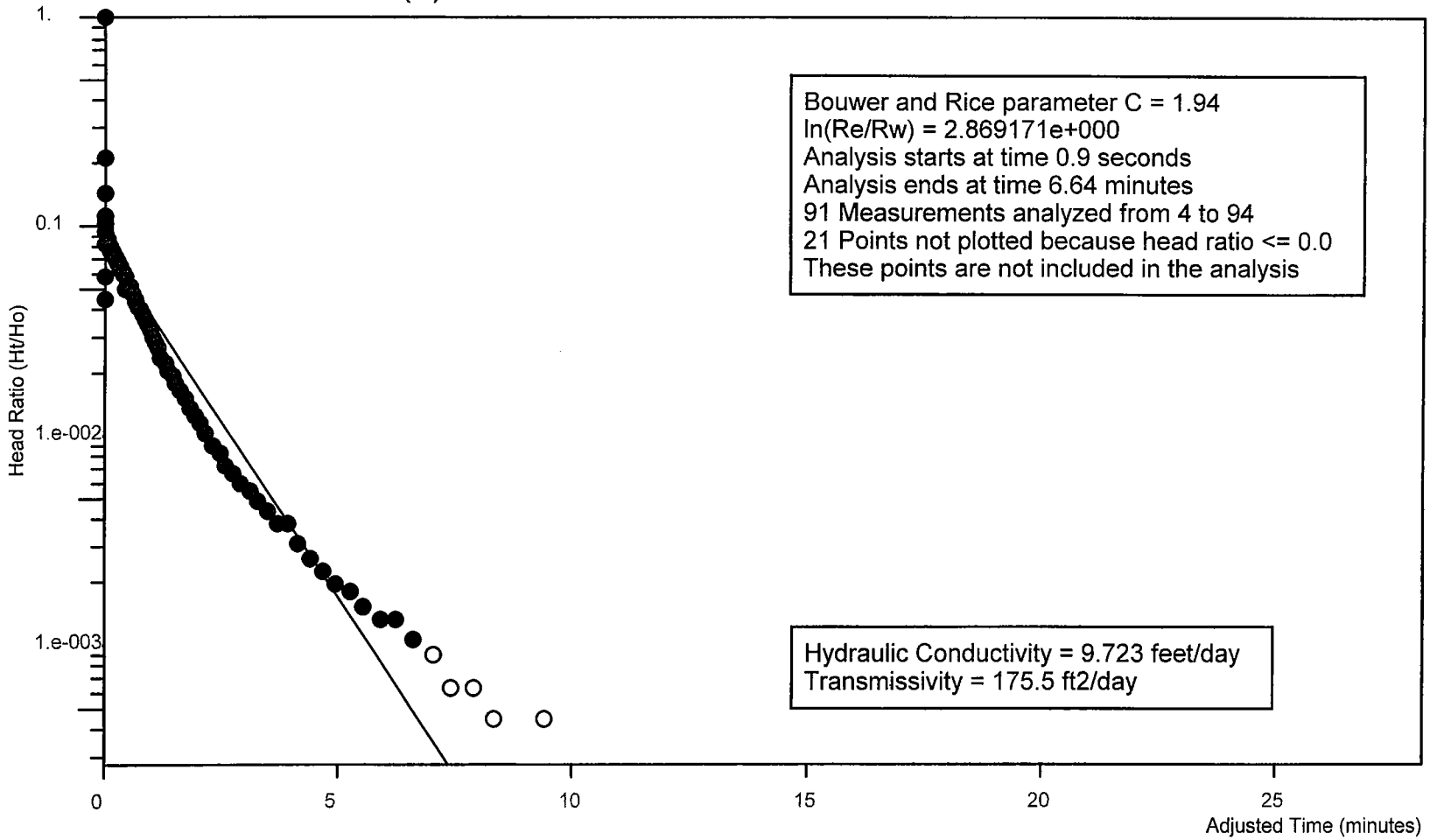
TIME VERSUS WELL RECOVERY GRAPHS

Falling Head Test 11/26/01

Fort McClellan Parcel 94 (7)

Bouwer and Rice Method

FTA-94-MW01



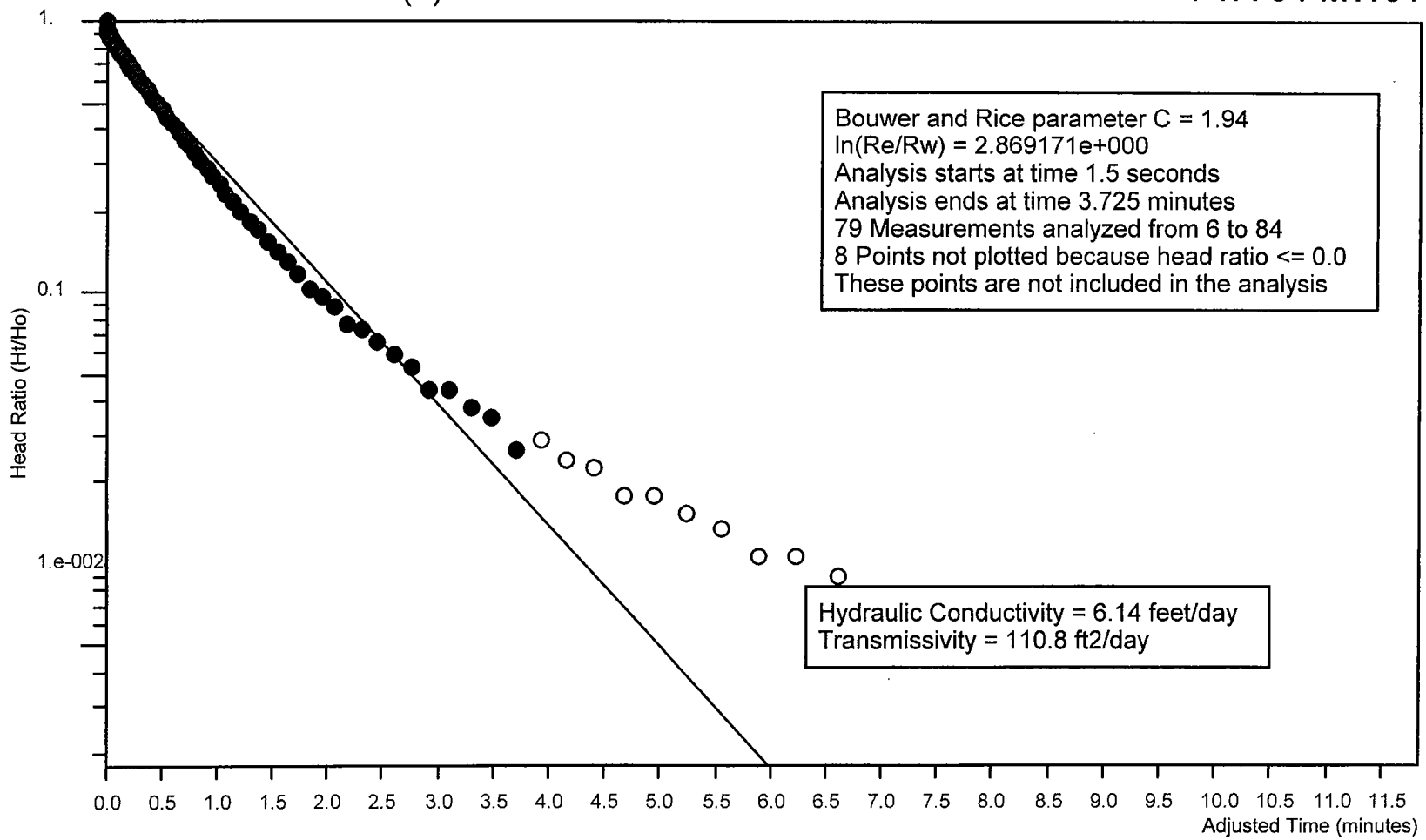
Ho is 11.13 feet at 0.9 seconds

Rising Head Test 11/26/01

Fort McClellan Parcel 94 (7)

Bouwer and Rice Method

FTA-94-MW01



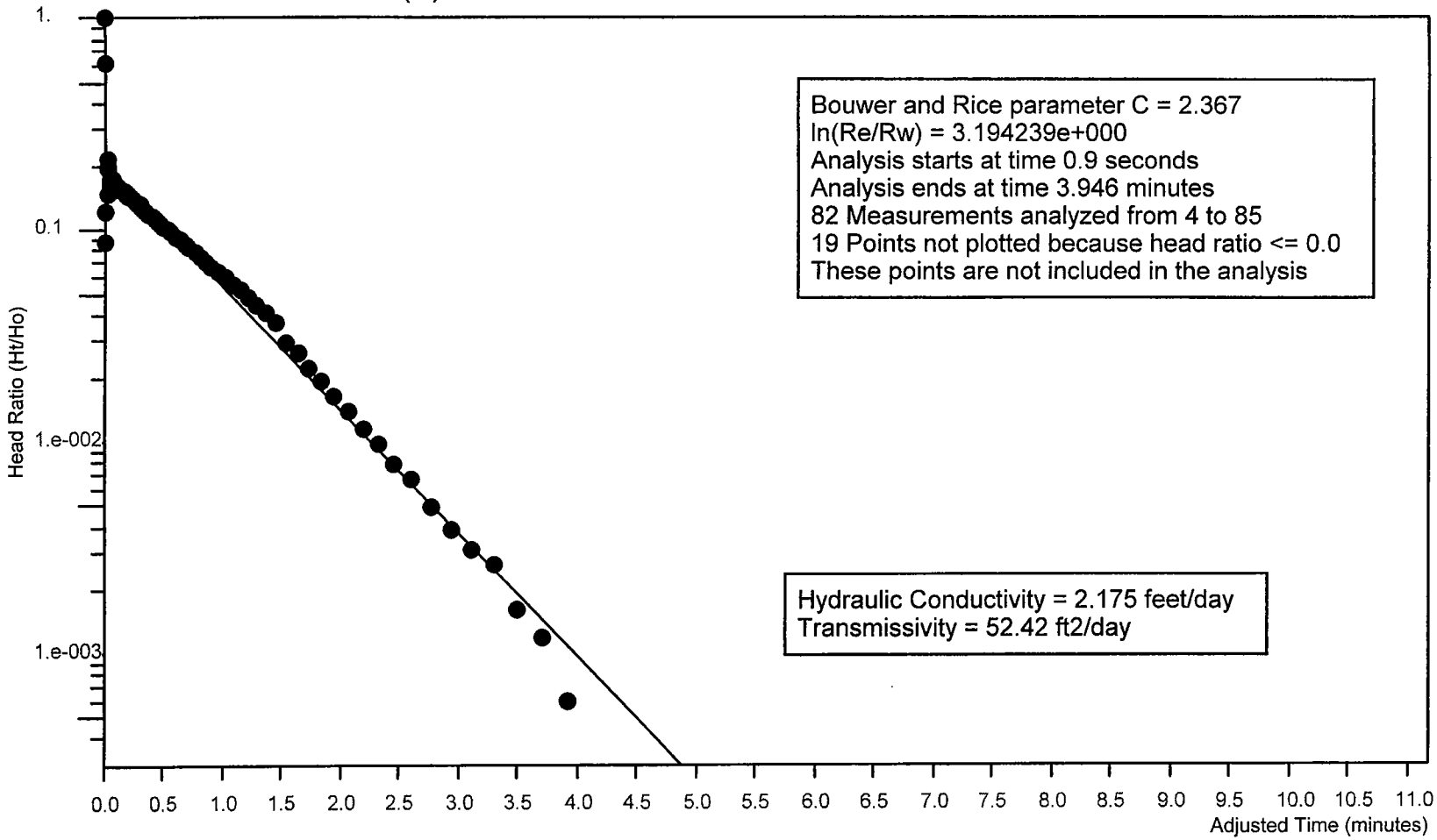
Ho is 1.121 feet at 1.5 seconds

Falling Head Test 11/26/01

Fort McClellan Parcel 94 (7)

Bouwer and Rice Method

FTA-94-MW02



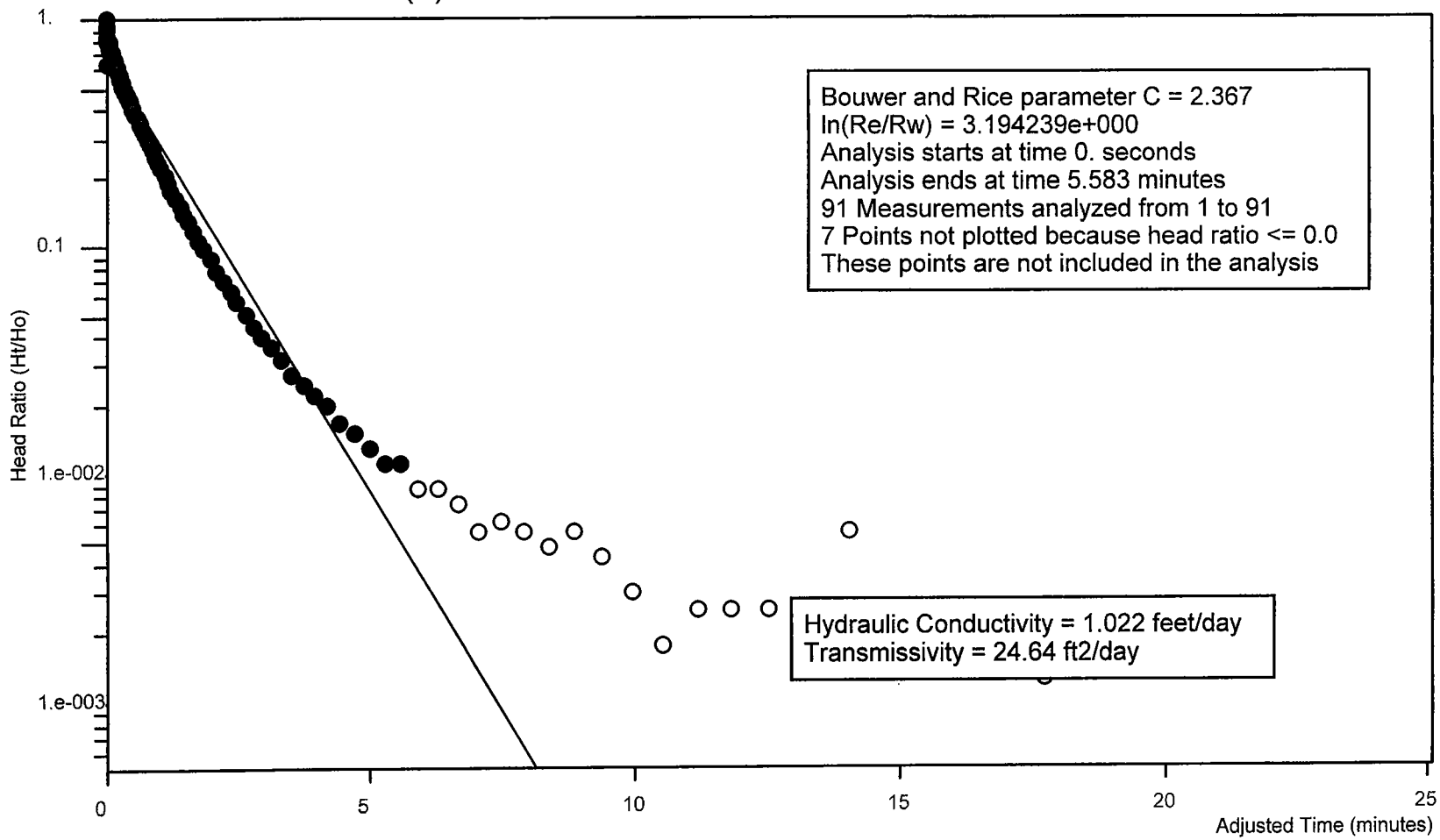
Ho is 16.99 feet at 0.9 seconds

Rising Head Test 11/26/01

Fort McClellan Parcel 94 (7)

Bouwer and Rice Method

FTA-94-MW02



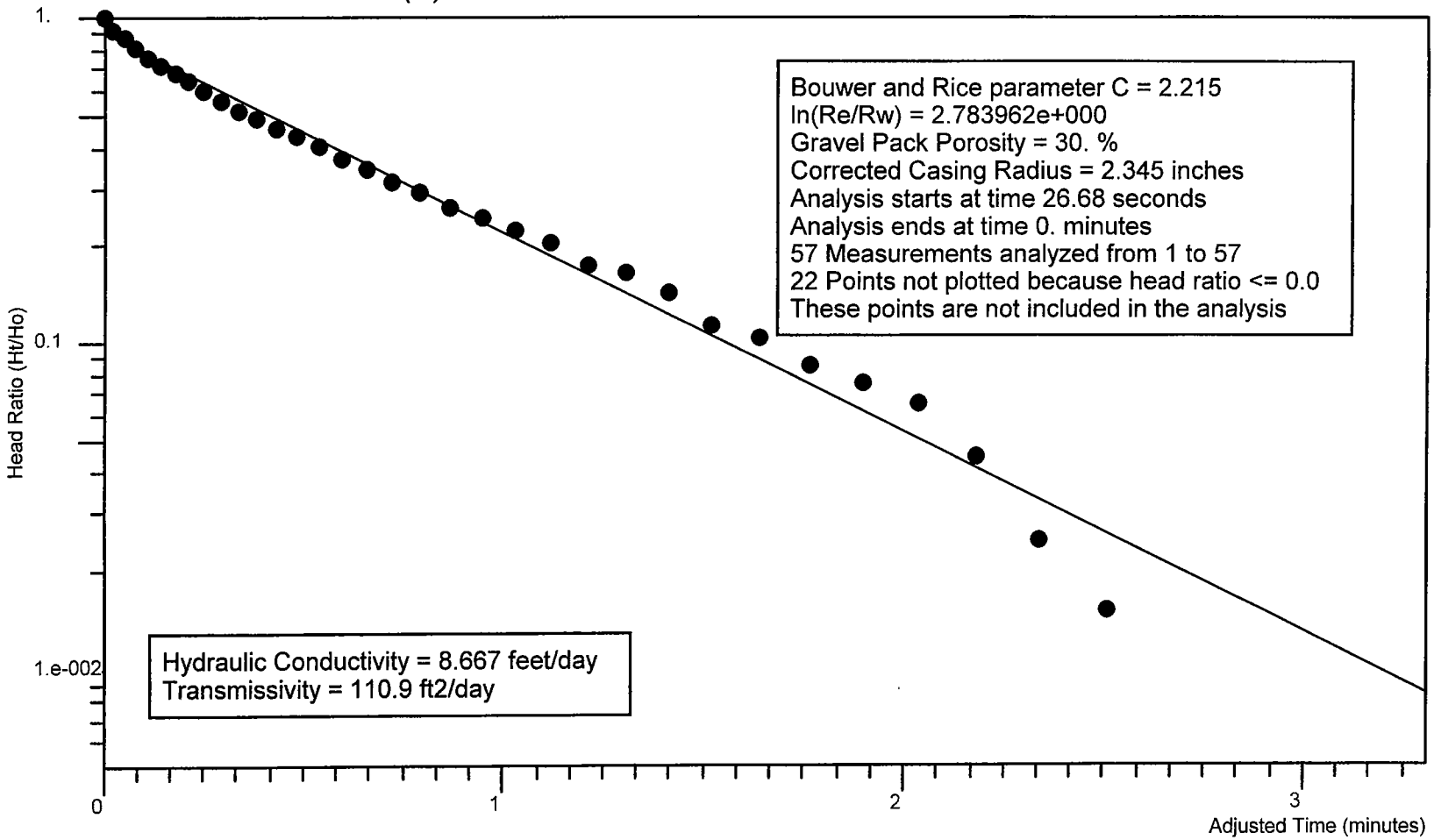
Ho is 3.907 feet at 0. seconds

Rising Head Test 11/27/01

Fort McClellan Parcel 94 (7)

Bouwer and Rice Method

FTA-94-MW05



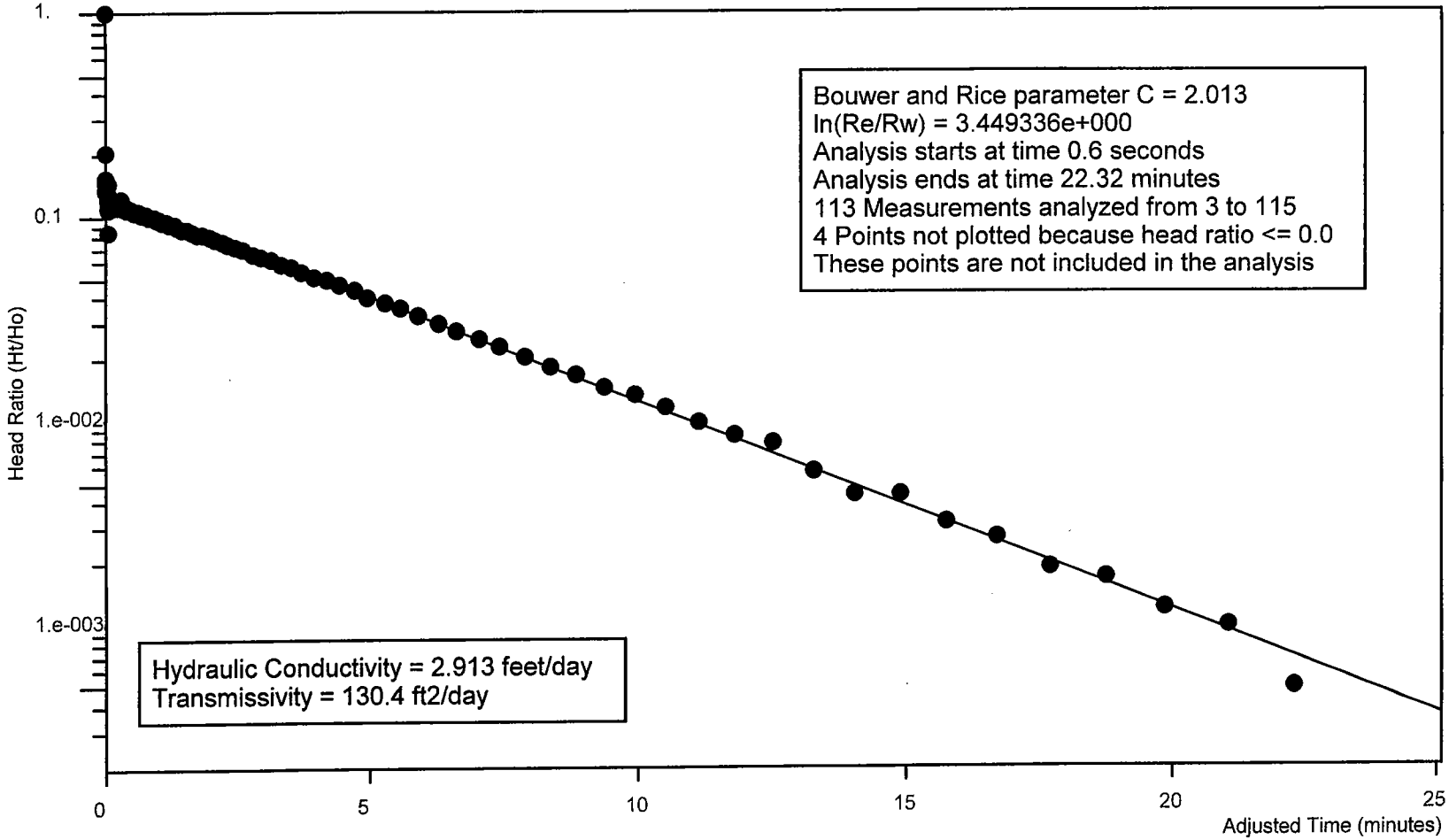
Ho is 0.201 feet at 26.68 seconds

Falling Head Test 11/26/01

Fort McClellan Parcel 94 (7)

Bouwer and Rice Method

FTA-94-MW11



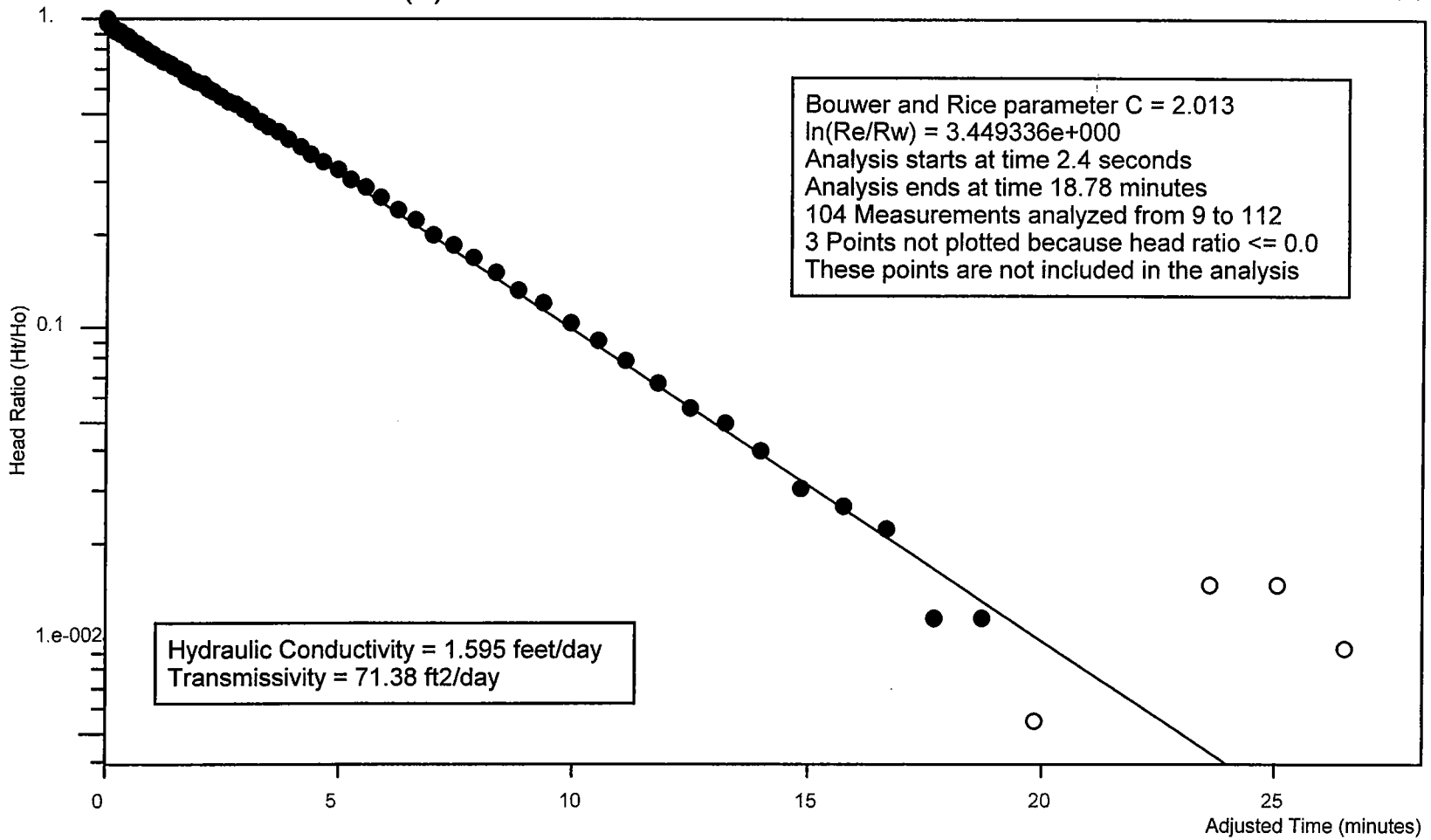
Ho is 10.06 feet at 0.6 seconds

Rising Test 11/26/01

Fort McClellan Parcel 94 (7)

Bouwer and Rice Method

FTA-94-MW11



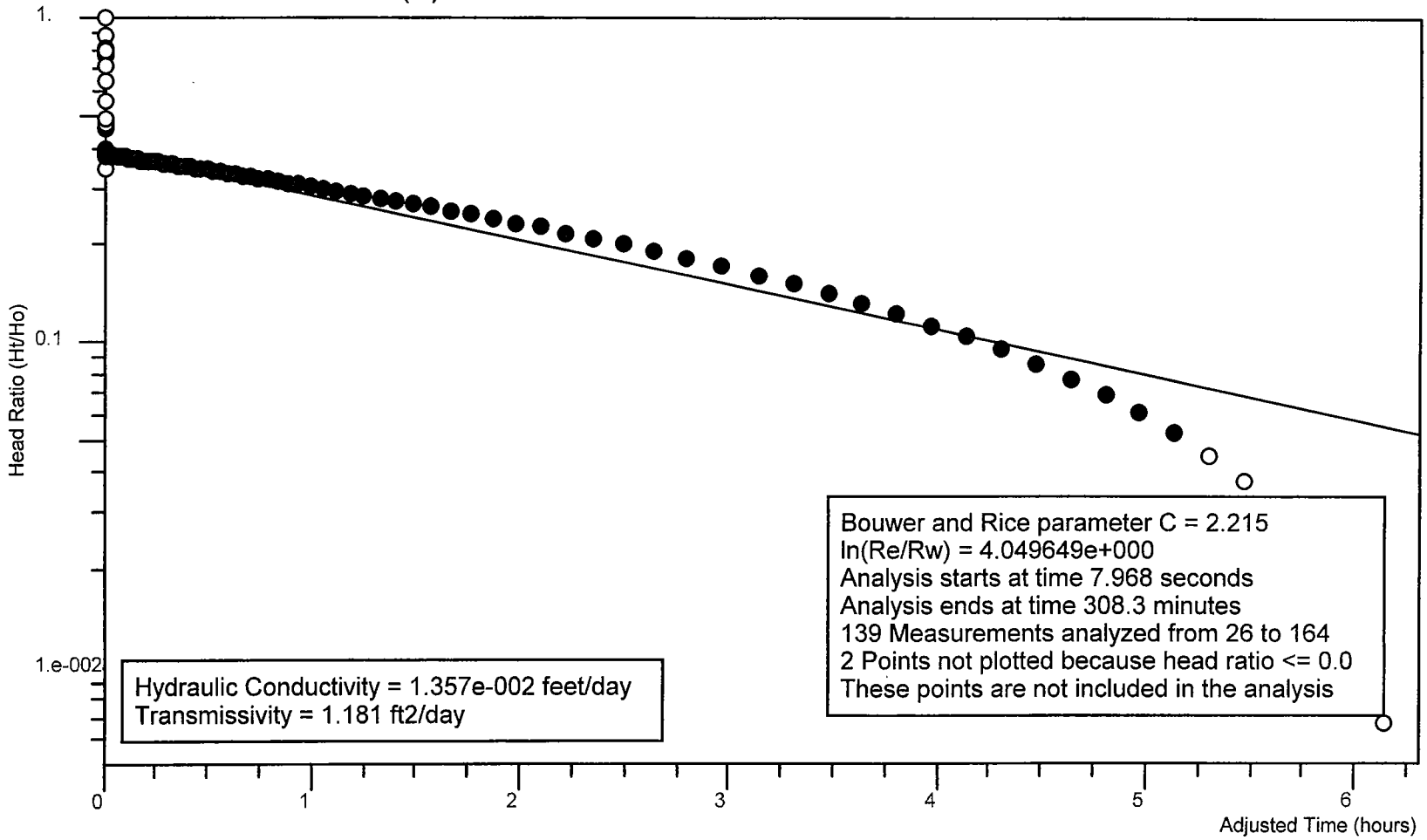
Ho is 1.275 feet at 2.4 seconds

Falling Head Test 11/26/01

Fort McClellan Parcel 94 (7)

Bouwer and Rice Method

FTA-94-MW12



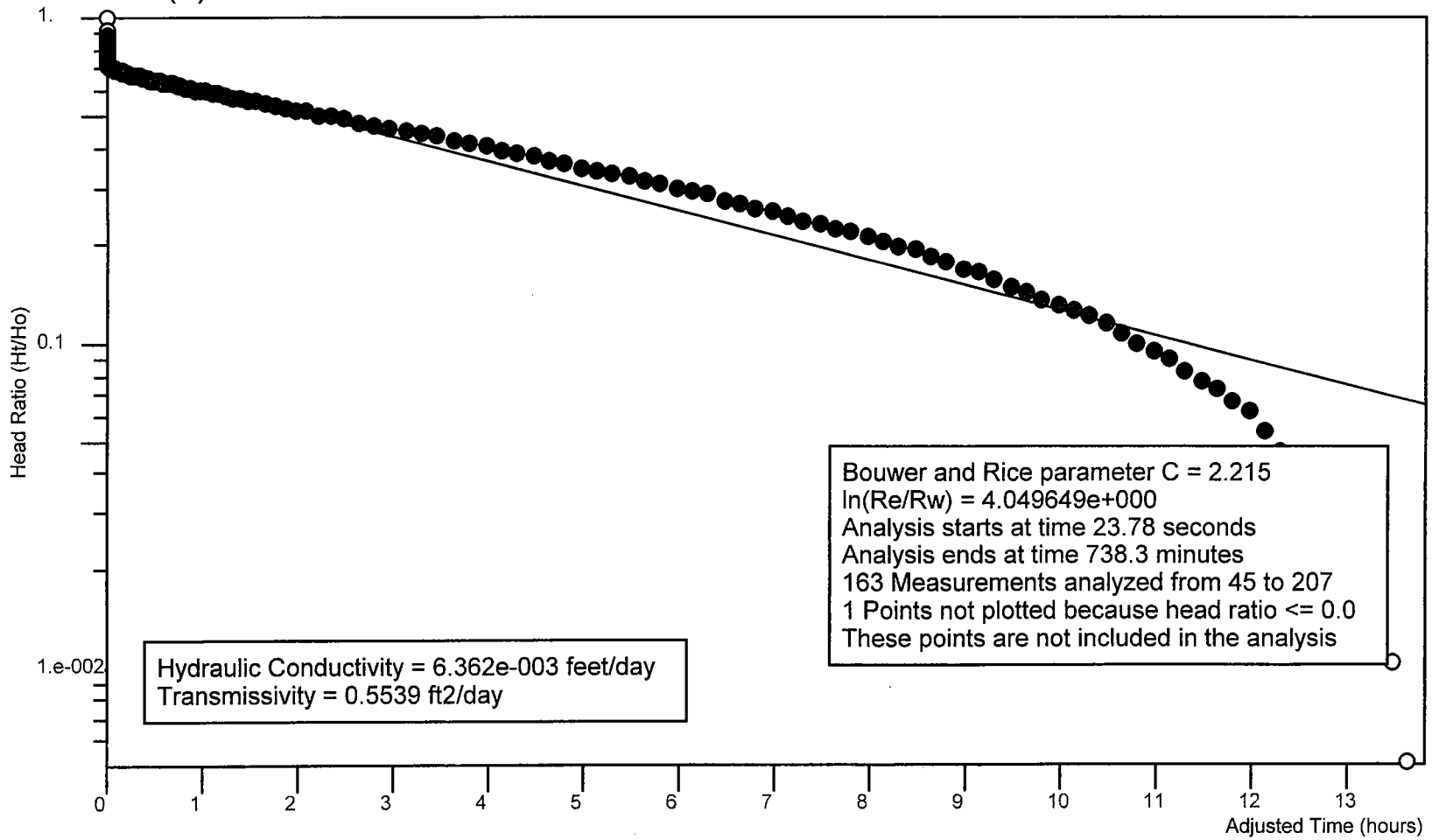
Ho is 4.466 feet at 2.1 seconds

Rising Head Test 11/26/01

Parcel 94 (7) FTA-94-MW12

Bouwer and Rice Method

FTA-94-MW12



Ho is 0.777 feet at 2.7 seconds

APPENDIX F

SEEP SURVEY RESULTS

the IT group

IT Corporation
A Member of The IT Group

M E M O R A N D U M

To: CK10 File, Fort McClellan, Calhoun County, Alabama
Former Chemical Laundry and
Motor Pool Area 1500, Parcel 94(7)

Date: December 8, 2000

From: Josh Jenkins 12/8/00

Subject: Seep Survey, December 6, 2000, Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)

IT conducted a seep survey at the Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7) to determine if any seeps are present at the parcel. The area surveyed is shown on Figure 1. The survey was performed to fulfill proposed work efforts outlined in Section 3.8 of the Site-Specific field Sampling Plan Addendum, Remedial Investigation, Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7), September 2000. The seep survey was conducted December 6, 2000. The previous measurable precipitation event was 0.13 inches recorded on November 29, 2000 at the Anniston Metropolitan Airport. There had not been any measurable rainfall recorded in the Anniston area since November 29, 2000, however, 7.21 inches of precipitation were recorded at the Anniston Metropolitan Airport during entire month of November 2000.

Based on observations made during the survey, surface soil observed at the parcel generally appeared damp to moist. Flowing water was observed in both Ingram Creek and Cane Creek. There were not any seeps, springs or wet areas noted in the survey area. Furthermore, there were not any observable changes in vegetation type, vegetation distribution, odors, or other evidence suggesting that intermittent seeps may exist at the Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7).

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 25 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- FENCE
- UTILITY POLE
- SEEP SURVEY AREA

SCALE

0 200 400 FEET

FIGURE F-1
SEEP SURVEY LOCATION MAP
FORMER CHEMICAL LAUNDRY
AND MOTOR POOL AREA 1500
PARCEL 94(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

DBILLING 04/29/02 05:28:19 PM c:\cadd\design\796887es.418

STARTING DATE: 03/21/02 DRAWN BY: D. BOMAR

DRAFT. CHCK. BY: ENGR. CHCK. BY: S. MORAN

INITIATOR: L. O'HARE PROJ. MGR.: J. YACOUB

DATE LAST REV.: DRAWN BY:

DWG. NO.: ...\796887es.418 PROJ. NO.: 796887

APPENDIX G

SURVEY DATA

Appendix G

Survey Data
Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
FTA-94-DEP01	1169027.56	672433.09	777.24	NA
FTA-94-DEP02	1168738.23	672962.34	791.83	NA
FTA-94-DEP03	1168570.10	672955.38	804.97	NA
FTA-94-DEP04	1168237.95	673260.38	789.05	NA
FTA-94-GP01	1168845.89	672425.33	790.89	NA
FTA-94-GP02	1168857.42	672494.45	792.92	795.49
FTA-94-GP03	1168587.00	672618.48	820.91	NA
FTA-94-GP04	1168588.88	672633.42	819.93	NA
FTA-94-GP05	1168051.03	673128.97	806.99	808.77
FTA-94-GP06	1168159.68	672968.37	807.24	NA
FTA-94-GP07	1168141.70	672986.82	806.57	NA
FTA-94-GP08	1167972.75	673352.38	811.49	NA
FTA-94-GP09	1167810.20	673240.16	812.71	NA
FTA-94-GP10	1167814.04	673223.78	812.51	NA
FTA-94-GP11	1168463.37	672762.39	814.10	816.10
FTA-94-GP12	1167659.86	673305.91	816.17	NA
FTA-94-GP13	1168014.74	673370.37	825.89	NA
FTA-94-GP14	1168018.80	673366.20	829.42	NA
FTA-94-GP15	1168023.20	673366.72	819.10	NA
FTA-94-GP16	1168024.29	673374.92	820.78	NA
FTA-94-GP17	1168030.33	673372.05	819.99	NA
FTA-94-GP18	1168031.57	673378.64	812.17	NA
FTA-94-GP19	1168014.24	673352.57	825.32	NA
FTA-94-MW01	1168296.49	673080.58	805.13	807.29
FTA-94-MW02	1168419.42	672884.35	810.70	812.75
FTA-94-MW03	1168564.57	673200.15	784.57	786.49
FTA-94-MW04	1168475.74	673257.53	785.55	787.60
FTA-94-MW05	1168068.27	673141.15	806.68	808.70
FTA-94-MW06	1168265.17	673318.48	787.84	789.78
FTA-94-MW07	1167807.94	673527.78	797.16	799.10
FTA-94-MW08	1168045.72	673349.50	809.10	811.09
FTA-94-MW09	1167889.92	673055.72	810.70	813.25
FTA-94-MW10	1168109.95	672924.08	806.69	806.59
FTA-94-MW11	1168303.58	673090.77	804.82	806.79
FTA-94-MW12	1168556.63	673203.52	785.13	787.16
FTA-94-MW13	1168275.09	673052.85	805.89	808.06
FTA-94-MW14	1168071.00	673025.20	807.44	807.20
FTA-94-MW15	1168571.48	673049.12	793.14	795.19
FTA-94-MW16	1168583.05	673064.25	790.99	793.00
WS-94-SW/SD01	1168579.63	673227.99	790.68	NA
WS-94-SW/SD02	1168005.85	673662.21	787.64	NA
WS-94-SW/SD03	1168922.60	673088.27	776.25	NA
WS-94-SW/SD04	1168153.28	673485.91	787.44	NA
WS-94-SW/SD05	1167923.83	673748.30	790.77	NA

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983 (NAD83).
Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).
ft amsl - Feet above mean sea level.
NA - Not applicable.

APPENDIX H

VARIANCE REPORTS

INTERNATIONAL TECHNOLOGY CORPORATION	**Variance No:** PARCEL94(7)SEPTEMBER00.VR1 **Linked w/NC No:** x **Date of Issue:** 9/28/00 **Page _1 of 1__**
Project Name: **Fort McClellan** – CK10	Project Number: 796887.03020300

-Variance Report -

I.Description: (by the person identifying the change)

FINAL SITE-SPECIFIC FIELD SAMPLING PLAN ADDENDUM, REMEDIAL INVESTIGATION FOR THE FORMER CHEMICAL LAUNDRY AND MOTOR POOL AREA 1500, PARCEL 94(7):

The Final Site-Specific Field Sampling Plan proposed residuum monitoring well FTA-94-MW10 hydraulically upgradient of existing well FTA-94-MW01, adjacent to 5th Avenue. Monitoring well FTA-94-MW10 was relocated approximately 80 feet northwest of the proposed location.

Identified by: Jeffrey Tarr, PG – IT Site Manager	Date: 9-28-00

II. Justification for Variance:

Permanent residuum monitoring well FTA-94-MW10 was not installed at its proposed location because competent bedrock was encountered and groundwater was not present during hollow-stem auger drilling operations. Three attempts were made to install monitoring well FTA-94-MW10, but all attempts were unsuccessful. Therefore, monitoring well FTA-94-MW10 was relocated approximately 80 feet northwest of the proposed location and successfully installed. This variance will not alter the scope or intent of the Remedial Investigation at the Former Chemical Laundry and Motor Pool Area 1500.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan Addendum, Remedial Investigation for the Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7), September 2000.

Distribution List:
1. Jeanne Yacoub, IT Project Manager
2. Steve Moran, IT Technical Lead
3. Jeffrey Tarr, IT Site Manager
4. Randy McBride, IT QA Officer
5. Mr. Ellis Pope, US Army Corps of Engineers
6. Mr. Ross McCollum, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr, PG - IT Site Manager	1-08-2001 Date
Approved by: Ellis C. Pope	1/12/01 Date
Project Manager Approval: Jeanne Yacoub	1/10/01 Date
QA Approval: Randall L. McBride	1/15/01 Date

INTERNATIONAL TECHNOLOGY CORPORATION	**Variance No:** PARCEL94(7)AUGUST01.VR1 **Linked w/NC No:** x **Date of Issue:** 8/13/01 **Page _1 of 1__**
Project Name: **Fort McClellan** – CK10 \ WAD03	Project Number: 796887.03020300

-Variance Report -

I.Description: (by the person identifying the change)

FINAL SITE-SPECIFIC FIELD SAMPLING PLAN ADDENDUM, FORMER CHEMICAL LAUNDRY AND MOTOR POOL AREA 1500, PARCEL 94(7)

The Final Site-Specific Field Sampling Plan (FSSFSP) proposed using hollow-stem augers to install residuum monitoring well FTA-94-MW15. Permanent residuum monitoring well FTA-94-MW15 was installed in competent bedrock using air-rotary drilling techniques.

Identified by: Jeffrey Tarr, PG – IT Site Manager	Date: 8-13-01

II. Justification for Variance:

The FSSFSP proposed drilling with hollow-stem augers at permanent residuum monitoring well location FTA-94-MW15. During hollow-stem auger drilling, competent bedrock was encountered at 15.5 feet below land surface (bls) and groundwater was not present. Therefore decision was made by the IT Site Manager to install residuum monitoring well FTA-94-MW15 using air-rotary drilling techniques. During air-rotary drilling groundwater was encountered in bedrock at approximately 39 feet bls and the well was successfully installed. Installing the proposed residuum well in bedrock will more accurately delineate the extent of the groundwater contaminant plume. This variance will not alter the intent of the Remedial Investigation at the Former Chemical Laundry and Motor Pool Area 1500.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan Addendum, Remedial Investigation, Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7), September, 2000.

Distribution List: 1. Jeanne Yacoub, IT Project Manager 2. Steve Moran, IT Technical Lead 3. Jeffrey Tarr, IT Site Manager 4. Randy McBride, IT QA Officer 5. Mr. Ellis Pope, US Army Corps of Engineers 6. Mr. Ross McCollum, US Army Corps of Engineers	**- Signatures -** Requested by: Jeffrey Tarr, PG - IT Site Manager Jeffrey J. Tarr 8-20-2001 Date Approved by: Stanley E. Sarratt 8-22-01 Date Project Manager Approval: Jeanne Yacoub 8/20/01 Date QA Approval: Randall L. McBride 8/23/01 Date

INTERNATIONAL TECHNOLOGY CORPORATION	Variance No: PARCEL94JAN99.VR1
	Linked w/NC No: x
	Date of Issue: 1-29-99
	Page _1 of 1__
Project Name: **Fort McClellan** - CK05	Project Number: **774645**

-Variance Report -

I.Description: (by the person identifying the change)

FORMER CHEMICAL LAUNDRY AREA AND MOTOR POOL 1500 PARCEL 94(7)

Proposed temporary well FTA-94-GP08 was not installed because bedrock was encountered and groundwater was not present.

Identified by: Jeffrey Tarr, PG - IT Site Manager	Date: 1-29-99

II. Proposed Corrective Action:

Unable to install temporary well FTA-94-GP08 using hollow-stem augers because bedrock was encountered and groundwater was not present during hollow-stem auger drilling operations. Drilling using air rotary techniques may produce enough groundwater so that a well can be installed and groundwater samples collected for chemical analysis.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan, Former Chemical Laundry and Motor Pool Area 1500 Parcel 94(7), October 1998.

Distribution List:
1. Jeanne Yacoub, IT Project Manager
2. Steve Moran, IT Technical Lead
3. Jeffrey Tarr, IT Site Manager
4. Randy McBride, IT QA Officer
5. Mr. Ellis Pope, US Army Corps of Engineers
6. Mr. Ross McCollum, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr Site Manager	Jeffrey Tarr	2/19/99 Date
Approved by:	Ellis C. Pope	11/5/99 Date
Project Manager Approval:	Jeanne Yacoub	3/18/99 Date
QA Approval:	[illegible]	2/28/99 Date

INTERNATIONAL TECHNOLOGY CORPORATION	Variance No: M1500OCT.VAR Linked w/NC No: Date of Issue: 10/27/98 Page _1 of 1__
Project Name: **Fort McClellan** - CK05	Project Number: **774645**

-Variance Report -

I.Description: (by the person identifying the change)

Former Chemical Laundry And Motor Pool Area 1500 Parcel 94(7), 132(7), 133(7), & Parcel 134(7)

Direct-push temporary wells were not installed because groundwater was not encountered during drilling operations using direct-push technology. The following direct-push temporary wells were not installed.
FTA-94-GP02, FTA-94-GP08, and FTA-94-GP11

Identified by: Jeffrey Tarr, PG - IT Site Manager	Date: 10-27-98

II. Justification for Variance:

Unable to install direct-push temporary wells because groundwater was not encountered during direct-push drilling operations. ;ef
International Technology will attempt to install wells using a drill rig. Drilling using hollow-stem augers may produce enough groundwater so that wells can be developed and groundwater samples collected.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan, Former Chemical Laundry and Motor Pool Area 1500, October 1998.

Distribution List: 1. Jeanne Yacoub, IT Project Manager 2. Steve Moran, IT Technical Lead 3. Jeffrey Tarr, IT Site Manager 4. Randy McBride, IT QA Officer 5. Mr. Ellis Pope, US Army Corps of Engineers 6. Mr. Ross McCollum, US Army Corps of Engineers	**- Signatures -** Requested by: Jeffrey Tarr, PG - IT Site Manager 3/4/99 Approved by: Ellis C. Pope 4/1/99 Project Manager Approval: Jeanne Yacoub 3/4 QA Approval:Randy McBride

INTERNATIONAL TECHNOLOGY CORPORATION	**Variance No:** PARCEL94(7)MARCH01.VR1
	Linked w/NC No: x
	Date of Issue: 3/19/01
	Page _1 of 1__
Project Name: **Fort McClellan** – CK10 \ WAD03	Project Number: 796887.03020300

-Variance Report -

I.Description: (by the person identifying the change)

FINAL SITE-SPECIFIC FIELD SAMPLING PLAN ADDENDUM, FORMER CHEMICAL LAUNDRY AND MOTOR POOL AREA 1500, PARCEL 94(7)

The Final Site-Specific Field Sampling Plan (FSSFSP) proposed using hollow-stem augers to install residuum monitoring well FTA-94-MW06. Permanent residuum monitoring well FTA-94-MW06 was moved approximately 60 feet southwest and installed into competent bedrock using air rotary drilling techniques.

Identified by: Jeffrey Tarr, PG – IT Site Manager	Date: 3-19-01

II. Justification for Variance:

The FSSFSP proposed drilling with hollow-stem augers at permanent residuum monitoring well location FTA-94-MW06. Hollow-stem auger refusal was encountered and groundwater was not present during drilling activities. Four attempts were made to install the monitoring well, but all attempts were unsuccessful. Therefore, a decision was made by the IT Site Manager to install residuum monitoring well FTA-94-MW06 using air rotary drilling techniques. Based upon groundwater data from existing monitoring wells at the site, a decision was made to move monitoring well FTA-94-MW06 approximately 60 feet further southwest. During air rotary drilling competent bedrock was encountered and groundwater was present. Therefore, the well was installed at that location. Relocation monitoring well FTA-94-MW06 will more accurately delineate the extent of the groundwater contaminant plume. This variance will not alter the intent of the Remedial Investigation at the Former Chemical Laundry and Motor Pool Area 1500.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan Addendum, Remedial Investigation, Former Chemical Laundry and Motor Pool Area 1500, Parcel 94(7), September, 2000.

Distribution List:
1. Jeanne Yacoub, IT Project Manager
2. Steve Moran, IT Technical Lead
3. Jeffrey Tarr, IT Site Manager
4. Randy McBride, IT QA Officer
5. Mr. Ellis Pope, US Army Corps of Engineers
6. Mr. Ross McCollum, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr, PG - IT Site Manager 3-20-01 Date

Approved by: Date

Project Manager Approval: Jeanne Yacoub 3/30/01 Date

QA Approval: Randy McBride 3/21/01 Date