HYDROGEOLOGIC CALCULATIONS
WILLIAM C. MEREDITH COMPANY
EAST POINT, GEORGIA
PERMIT NO. HW-062(D)

The following hydrogeologic calculations are provided as a supplement to the text for annual reports. The hydrogeological calculations were performed using values calculated using the April 2023 groundwater elevation data, calculated hydraulic conductivity data, and estimated values derived from published sources referenced. Supplemental vertical groundwater flow velocities were also calculated using newly installed monitoring wells MW-8A, MW-8B, and MW-8B2.

***Horizontal Groundwater Flow Velocity (Vh)*:**

The average horizontal groundwater flow was calculated using data collected during the April 2023 sampling event. Calculations were performed using the following formula taken from Darcy's equation for fluid flow through a porous medium:

$$Vh = \left[\frac{K \frac{dh}{dl}}{n} \right]$$

Where:

K = the average hydraulic conductivity of 3.565×10^{-6} centimeters per second (cm/sec) or 0.010 feet per day (ft/day), calculated using data evaluated from wells PW-1, MW-5R, MW-6R, and MW-7 from May 1990 recovery tests;

dh/dl = the hydraulic gradient measured as the hydraulic head distance between up-gradient well MW-6R and down-gradient well MW-12 (April 2023 data), divided by the measured distance between the wells, equaling 0.036 ft/ft; and

n = an estimated effective porosity for a silty-sand saprolite of 20% or 0.20 (taken from *Fetter, C. W., 1988, Applied Hydrogeology, 2nd Edition, Macmillan Publishing Company, New York, 592 p.*).

Using this formula, an average horizontal groundwater flow velocity of **0.0018** ft/day or **0.657** feet per year (ft/year) was calculated.

This calculated value assumes groundwater flow occurs through a homogeneous, isotropic, porous medium. Since groundwater flow in the Piedmont is commonly influenced by secondary fracture pathways caused by soil heterogeneities and other structural features not accounted for in this equation, this calculated value should be considered an estimate only of the actual horizontal groundwater flow velocity.

Vertical Groundwater Flow Velocity:

Vertical groundwater flow dynamics have not been evaluated through actual field testing. Comparative observations have been made based on differences in groundwater elevation readings taken from "nested" well locations. Based on these observations, there does not appear to be a hydraulic separation between shallow residuum (saprolite) and weathered rock/top-of-rock (PWR) zones. However, calculations were performed for a vertical groundwater flow or seepage velocity using MW-7/MW-8 and MW-7A/MW-8A (Vv), MW-7A/MW-8A and MW-7B/MW-8B (Vvv), and MW-7B/MW-8B and MW-7B2/MW-8B2 (Vvv).

Vertical Groundwater Flow Velocity (Vv) between Residuum and PWR Zones:

MW-7 and MW-7A

A review of the boring log and well schematic for MW-7A indicates the well is screened from 48-53 feet below ground surface (ft-bgs) in a weathered mica schist while MW-7 is screened from 28-38 ft-bgs in shallow residual soils. Vertical groundwater flow/seepage between MW-7 and MW-7A likely involves a combination of porous flow through soil and flow through secondary pathways caused by foliation or preferential pathways in the weathered bedrock (saprolite). The vertical groundwater flow (Vv) was calculated using Darcy's equation:

$$Vv = \left[\frac{Kv\,\frac{dh}{dl}}{n}\right]$$

Where:

Kv = the average hydraulic conductivity of 3.565 x 10^{-6} cm/sec or 0.010 ft/day, similar to published values for a weathered mica schist as described in *Batu, Vedat, 1998, Aquifer Hydraulics, John Wiley & Sons, Inc., New York, 727p.*;

dh/dl = the vertical hydraulic gradient measured using the head difference between MW-7 and MW-7A (April 2023 data) divided by the midpoint of each screened interval as the travel length. The calculated gradient is 0.034 ft/ft; and

n = an estimated porosity of 18% or 0.18, assuming a combination of porous and fracture flow for a schist (taken from *Batu, Vedat, 1998, Aquifer Hydraulics, John Wiley & Sons, Inc., New York, 727p.*).

Using these values, the calculated Vv = **0.0019** ft/day or **0.663** ft/year was calculated.

MW-8 and MW-8A

A review of the boring log and well schematic for MW-8A indicates the well is screened from 45-50 ft-bgs in a weathered mica schist while MW-8 is screened from 27-37 ft-bgs in shallow residual soils. As noted above, vertical groundwater flow/seepage between these wells likely involves a combination of porous flow through soil and flow through secondary pathways caused by foliation or preferential pathways in the weathered bedrock (saprolite). The vertical groundwater flow (Vv) was calculated using Darcy's equation:

$$Vv = \left[\frac{Kv \frac{dh}{dl}}{n}\right]$$

Where:

Kv = the average hydraulic conductivity of 3.565×10^{-6} cm/sec or 0.010 ft/day, similar to published values for a weathered mica schist as described in *Batu, Vedat, 1998, Aquifer Hydraulics, John Wiley & Sons, Inc., New York, 727p.*;

dh/dl = the vertical hydraulic gradient measured using the head difference between MW-8 and MW-8A (April 2023 data) divided by the midpoint of each screened interval as the travel length. The calculated gradient is 0.043 ft/ft; and

n = an estimated porosity of 18% or 0.18, assuming a combination of porous and fracture flow for a schist (taken from *Batu, Vedat, 1998, Aquifer Hydraulics, John Wiley & Sons, Inc., New York, 727p.*).

Using these values, the calculated Vv = **0.0024** ft/day or **0.876** ft/year was calculated.

Vertical Groundwater Flow Velocity between PWR and Bedrock Zones (Vvv):

MW-7A and MW-7B

Vertical groundwater flow/seepage between MW-7A and MW-7B is assumed to occur along secondary pathways caused by foliation, jointing, or fracturing in the PWR and bedrock. A review of the boring log for MW-7B indicates the presence of competent biotite-muscovite-gneiss bedrock beginning at a depth of 65 ft-bgs. Possible water-bearing fractures were identified during drilling at depths of 87 ft-bgs, 107 ft-bgs, 110 ft-bgs, 115 ft-bgs, and 118 ft-bgs. The aperture size, orientation, and connectivity of these fractures is unknown. The screened interval for MW-7B is 111-121 ft-bgs.

Vertical groundwater flow (Vvv) was calculated using Darcy's equation with the following values:

$$Vvv = \left[\frac{Kv\frac{dh}{dl}}{n}\right]$$

Where:

Kv = an estimate of the vertical hydraulic conductivity for fractured gneiss of 1 x 10^{-7} cm/sec or 0.0003 ft/day (taken from *Batu, Vedat, 1998, Aquifer Hydraulics, John Wiley & Sons, Inc., New York, 727p.*);

dh/dl = the vertical hydraulic gradient determined using the head difference between MW-7A and MW-7B (April 2023 data) divided by the midpoint of each screened interval as the travel length and equaling 0.024 ft/ft; and,

n = an estimated fracture porosity of 2% or 0.02 was used (taken from *Freeze, R.A., and Cherry, J.A., 1979, Groundwater: New Jersey, Prentice Hall, Inc., 604 p.*).

Using these values, the calculated Vvv = **0.00036** ft/day or **0.13** ft/year.

MW-8A and MW-8B

Similar to MW-7A and MW-7B, vertical groundwater flow/seepage between MW-8A and MW-8B is assumed to occur along secondary pathways caused by foliation, jointing, or fracturing in the PWR and bedrock. A review of the boring log for MW-8B indicates the presence of competent biotite-muscovite-gneiss bedrock beginning at a depth of approximately 55 ft-bgs.

Possible water-bearing fractures were identified during drilling at depths of 53-58 ft-bgs, 61-66 ft-bgs, 66-71 ft-bgs, 71-76 ft-bgs, 91-96 ft-bgs, and 148-153 ft-bgs. The aperture size, orientation, and connectivity of these fractures is unknown. MW-8B was set as an open borehole from 55-80 ft-bgs.

Vertical groundwater flow (Vvv) was calculated using Darcy's equation with the following values:

$$Vvv = \left[\frac{Kv\frac{dh}{dl}}{n}\right]$$

Where:

Kv = an estimate of the vertical hydraulic conductivity for fractured gneiss of 1 x 10^{-7} cm/sec or 0.0003 ft/day (taken from *Batu, Vedat, 1998, Aquifer Hydraulics, John Wiley & Sons, Inc., New York, 727p.*);

dh/dl = the vertical hydraulic gradient determined using the head difference between MW-8A and MW-8B (April 2023 data) divided by the midpoint of each screened interval as the travel length and equaling 0.008 ft/ft; and,

n = an estimated fracture porosity of 2% or 0.02 was used (taken from *Freeze, R.A., and Cherry, J.A., 1979, Groundwater: New Jersey, Prentice Hall, Inc., 604 p.*).

Using these values, the calculated Vvv = **0.00012** ft/day or **0.044** ft/year

Vertical Groundwater Flow Velocity between Intermediate and Deep Bedrock Zones (Vvvv):

MW-7B and MW-7B2

Vertical groundwater flow/seepage between MW-7B (screened 111-121 ft-bgs) and MW-7B2 (screened 195-200 ft-bgs) is assumed to occur along secondary pathways caused by foliation, jointing, or fracturing in the bedrock. The extent and orientation of water-bearing fractures encountered in these two wells is unknown. Dissolved VOC and SVOC contaminant impact has been observed in MW-7B and in discrete water samples collected at intervals of 148-150 ft-bgs and 173-175 ft-bgs, during the drilling of MW-7B2. Detectable VOC/SVOC concentrations were not observed in MW-7B2 suggesting some hydraulic separation between fracture zones.

Vertical groundwater flow (Vvvv) was calculated using Darcy's equation with the following values:

$$Vvv = \left[\frac{Kv\frac{dh}{dl}}{n}\right]$$

Where:

Kv = an estimate of the vertical hydraulic conductivity for fractured gneiss of 1 x 10^{-9} cm/sec or 0.000003 ft/day (taken from *Batu, Vedat, 1998, Aquifer Hydraulics, John Wiley & Sons, Inc., New York, 727p.*);

dh/dl = the vertical hydraulic gradient determined using the head difference between MW-7B and MW-7B2 (April 2023 data) divided by the midpoint of each screened interval as the travel length and equaling 0.033 ft/ft; and,

n = an estimated fracture porosity of 1% or 0.01 was used (taken from *Freeze, R.A., and Cherry, J.A., 1979, Groundwater: New Jersey, Prentice Hall, Inc., 604 p.*).

Using these values, the calculated Vvvv = **0.0000099** ft/day or **0.0036** ft/year.

MW-8B and MW-8B2

Vertical groundwater flow/seepage between MW-8B (open borehole 55-80 ft-bgs) and MW-8B2 (screened 148-153 ft-bgs) is assumed to occur along secondary pathways caused by foliation, jointing, or fracturing in the bedrock. Fractures were observed at MW-8B, most evidenced by moderate to slight rock weathering, iron oxide (rust colored) mineralization, and oil contaminant odor.

In addition, during well installation activities, MW-8B contained oil product residue in fracture zones encountered in the 66-71 ft-bgs interval. Dissolved VOC and SVOC contaminant impact has been observed in both MW-8B and MW-8B2 suggesting hydraulic connection between fracture zones.

Vertical groundwater flow (Vvvv) was calculated using Darcy's equation with the following values:

$$Vvv = \left[\frac{Kv\frac{dh}{dl}}{n}\right]$$

Where:

Kv = an estimate of the vertical hydraulic conductivity for fractured gneiss of 1 x 10^{-9} cm/sec or 0.000003 ft/day (taken from *Batu, Vedat, 1998, Aquifer Hydraulics, John Wiley & Sons, Inc., New York, 727p.*);

dh/dl = the vertical hydraulic gradient determined using the head difference between MW-8B and MW-8B2 (April 2023 data) divided by the midpoint of each screened interval as the travel length and equaling 0.0068 ft/ft; and,

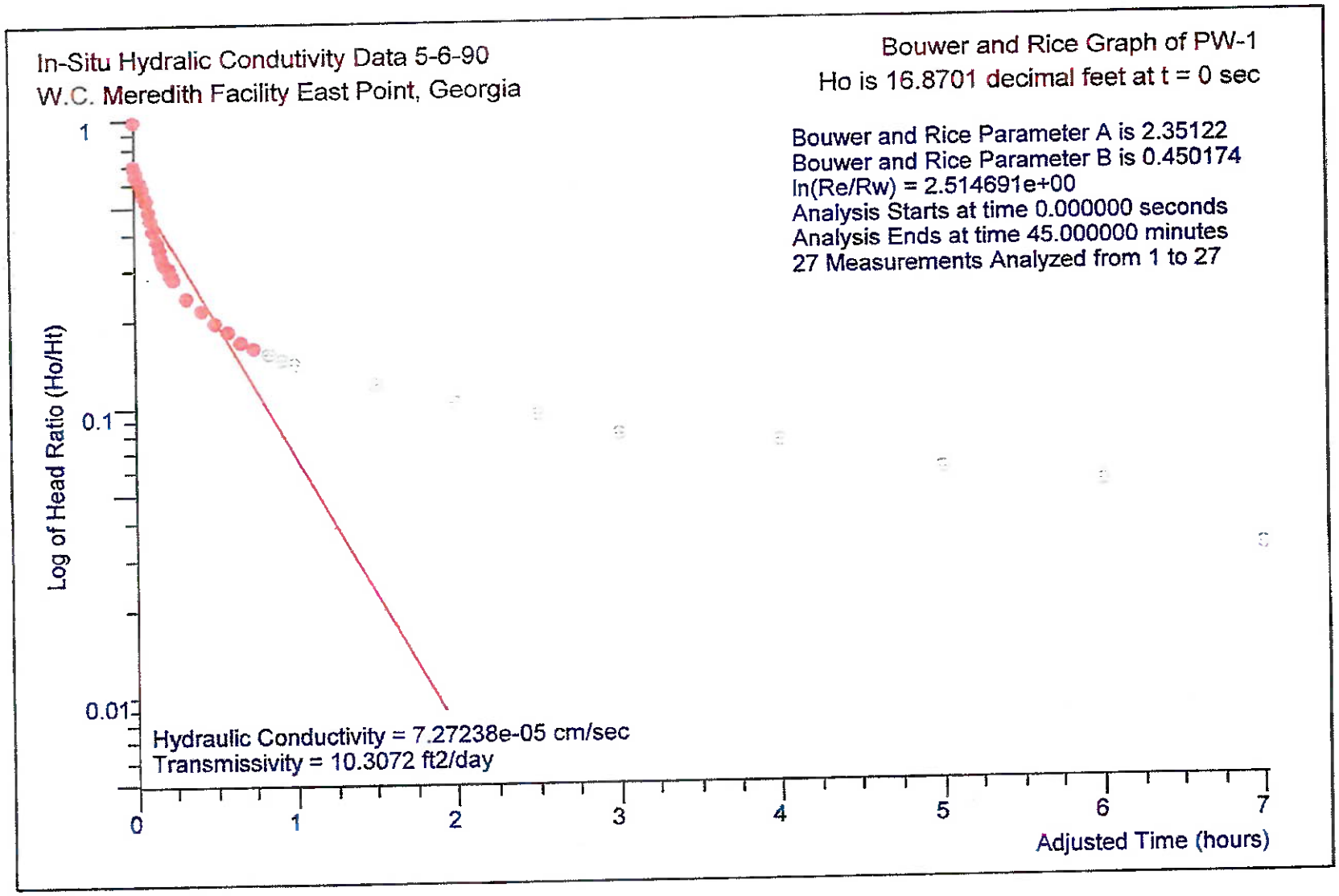
n = an estimated fracture porosity of 1% or 0.01 was used (taken from *Freeze, R.A., and Cherry, J.A., 1979, Groundwater: New Jersey, Prentice Hall, Inc., 604 p.*).

Using these values, the calculated Vvvv = **0.0000020** ft/day or **0.00073** ft/year.

Data from file:	W:\PW-1.SLG
Title:	In-Situ Hydralic Condutivity Data
Site Name:	W.C. Meredith Facility
Location:	East Point, Georgia
Client:	
Project Number:	
Test Date:	5-6-90
Well Number:	PW-1
Casing Radius:	0.167 feet
Effective Well Radius:	0.333 feet
Aquifer Thickness:	50 feet
Water Table to Screen Bottom:	25.03 feet
Screen Length:	10 feet
Static Water Level:	17.97 decimal feet

K ratio is 1
There are 38 time and drawdown measurements
Tests starts with trial 1
Time values will be adjusted by 0 days (0.000000 seconds)

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (decimal feet)	Head (decimal feet)	Head Ratio
1	0	0	34.8401	16.8701	1
2	0.5	0.5	29.76	11.79	0.698869
3	0.999999	0.999999	29.16	11.19	0.663303
4	1.5	1.5	28.86	10.89	0.645519
5	2	2	28.48	10.51	0.622995
6	2.5	2.5	28.27	10.3	0.610547
7	3	3	28.02	10.05	0.595728
8	3.50001	3.50001	27.77	9.8	0.580909
9	4	4	27.46	9.49	0.562533
10	4.5	4.5	27.08	9.10999	0.540007
11	5	5	26.75	8.78	0.520447
12	6.00001	6.00001	26.13	8.16	0.483695
13	7	7	25.53	7.56001	0.44813
14	8.00001	8.00001	24.98	7.01001	0.415528
15	9	9	24.39	6.41999	0.380554
16	9.99999	9.99999	24	6.03	0.357437
17	11	11	23.59	5.62	0.333133
18	12	12	23.3	5.33001	0.315944
19	13	13	23.12	5.14999	0.305273
20	14	14	22.87	4.9	0.290454
21	15	15	22.71	4.73999	0.28097
22	28	20	22.09	4.11999	0.244218
23	25	25	21.66	3.69001	0.21873
24	30	30	21.33	3.35999	0.199168
25	35.0001	35.0001	21.08	3.10999	0.184349
26	40	40	20.86	2.89002	0.17131
27	45	45	20.71	2.73998	0.162416
28	50	50	20.57	2.59999	0.154118
29	54.9999	54.9999	20.44	2.47001	0.146413
30	60.0001	60.0001	20.35	2.38002	0.141079
31	90	90	19.99	2.02001	0.119739
32	120	120	19.72	1.75	0.103734
33	150	150	19.53	1.56001	0.0924718
34	180	180	19.3	1.33	0.0788373
35	240	240	19.21	1.24	0.0735028
36	300	300	18.96	0.990005	0.0586839
37	360	360	18.85	0.880001	0.0521633
38	420.001	420.001	18.49	0.519998	0.0308236

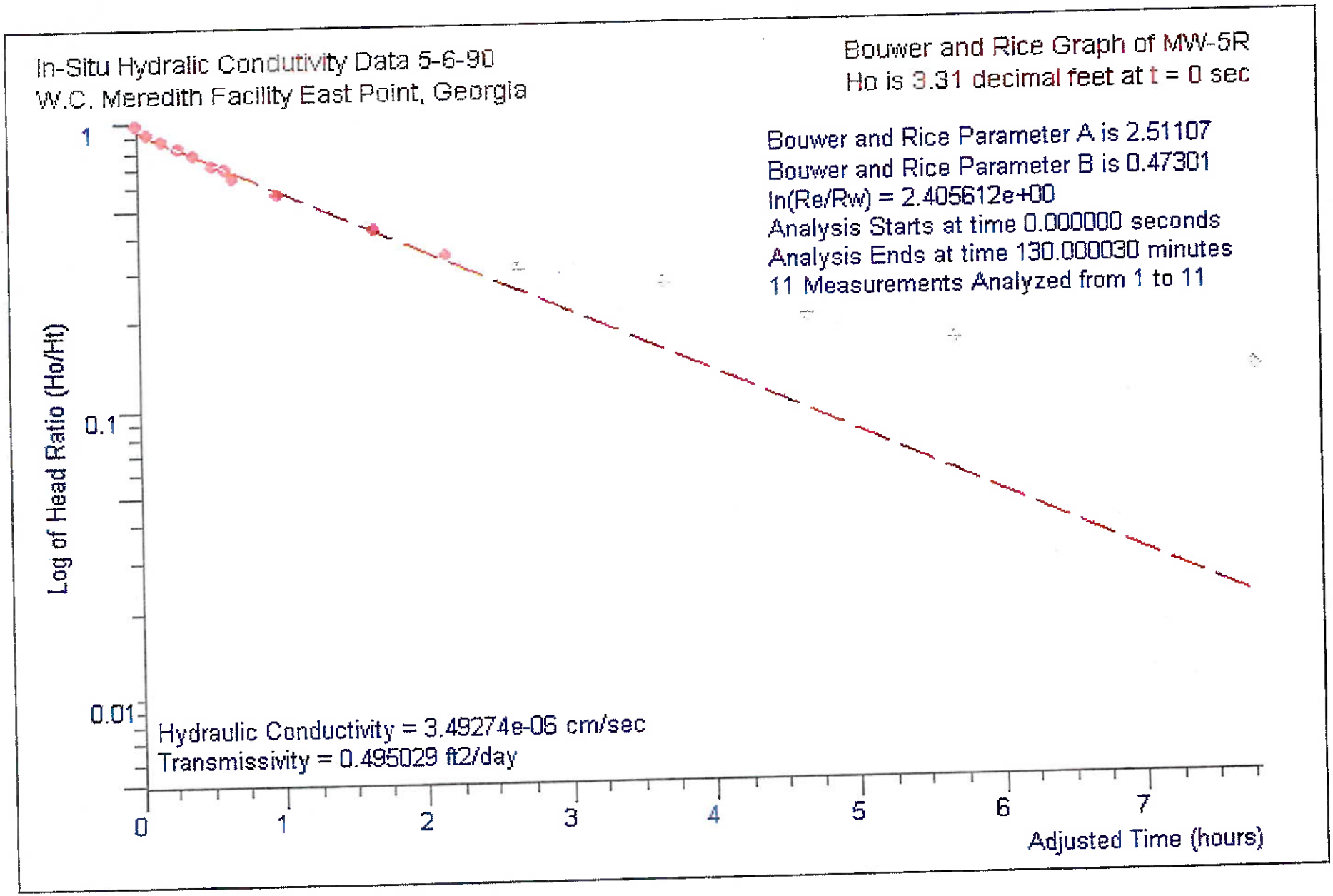

In-Situ Hydralic Condutivity Data 5-6-90
W.C. Meredith Facility East Point, Georgia
Bouwer and Rice Graph of PW-1
Ho is 16.8701 decimal feet at t = 0 sec
Bouwer and Rice Parameter A is 2.35122
Bouwer and Rice Parameter B is 0.450174
ln(Re/Rw) = 2.514691e+00
Analysis Starts at time 0.000000 seconds
Analysis Ends at time 45.000000 minutes
27 Measurements Analyzed from 1 to 27
Log of Head Ratio (Ho/Ht)
1
0.1
0.01
Hydraulic Conductivity = 7.27238e-05 cm/sec
Transmissivity = 10.3072 ft2/day
0
1
2
3
4
5
6
7
Adjusted Time (hours)

Data has not been saved

Title:	In-Situ Hydralic Condutivity Data
Site Name:	W.C. Meredith Facility
Location:	East Point, Georgia
Client:	
Project Number:	
Test Date:	5-6-90
Well Number:	MW-5R
Casing Radius:	0.083 feet
Effective Well Radius:	0.292 feet
Aquifer Thickness:	50 feet
Water Table to Screen Bottom:	15.6 feet
Screen Length:	10 feet
Static Water Level:	18.4 decimal feet

K ratio is 1
There are 16 time and drawdown measurements
Tests starts with trial 1
Time values will be adjusted by 0 days (0.000000 seconds)

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (decimal feet)	Head (decimal feet)	Head Ratio
1	0	0	21.71	3.31	1
2	5	5	21.49	3.08999	0.933532
3	11	11	21.27	2.86998	0.867063
4	18	18	21.12	2.71998	0.821746
5	25	25	20.94	2.54	0.76737
6	32	32	20.75	2.35	0.709971
7	36.9999	36.9999	20.67	2.26999	0.685797
8	41	41	20.53	2.12999	0.643503
9	60.0001	60.0001	20.25	1.85001	0.558916
10	99.9999	99.9999	19.79	1.39001	0.419943
11	130	130	19.52	1.12	0.338369
12	160	160	19.4	0.999988	0.302111
13	220	220	19.28	0.880009	0.265864
14	279.999	279.999	19.07	0.670006	0.202419
15	341.001	341.001	18.94	0.539988	0.163138
16	467.001	467.001	18.82	0.420009	0.126891

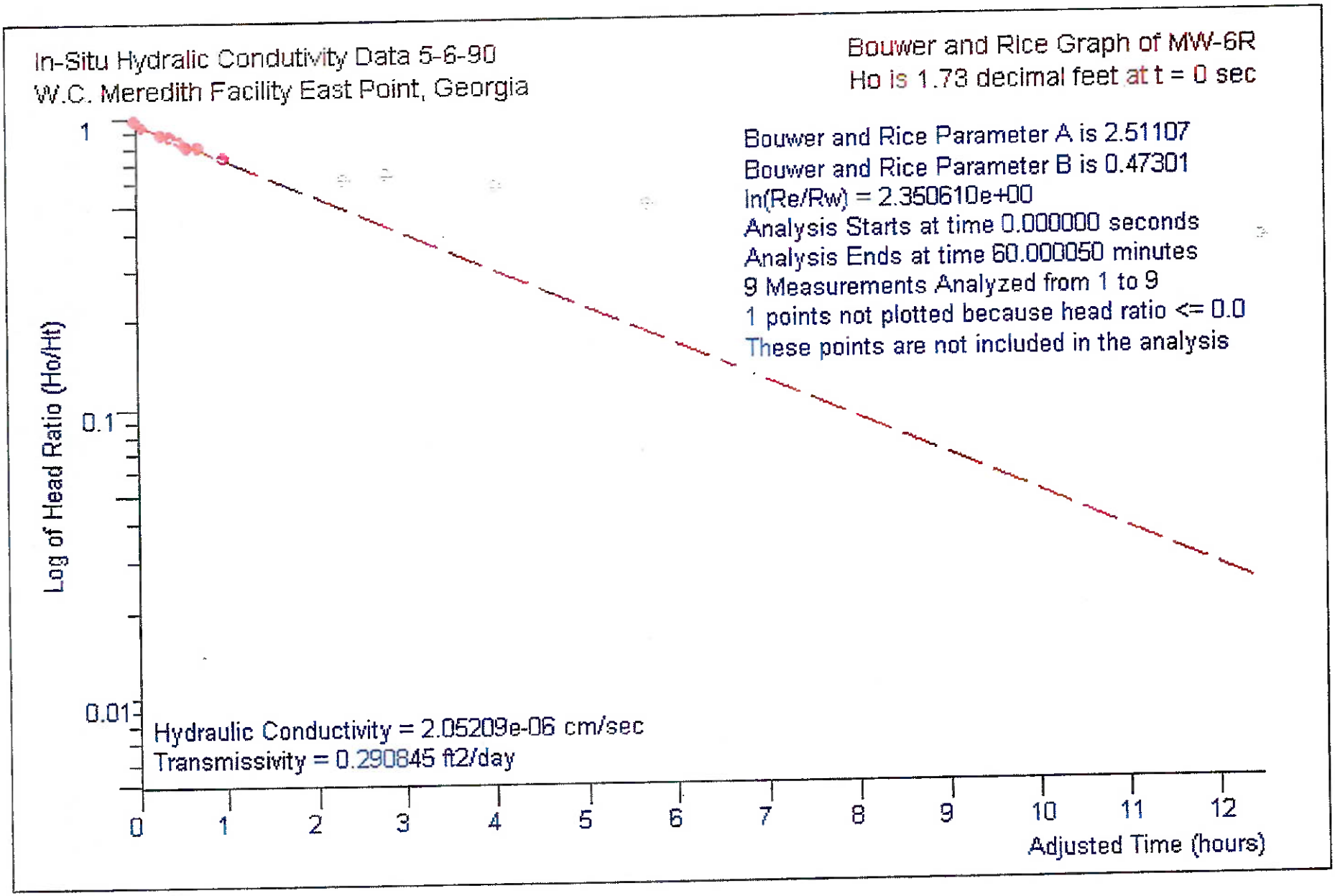

In-Situ Hydralic Condutivity Data 5-6-90
W.C. Meredith Facility East Point, Georgia
Bouwer and Rice Graph of MW-5R
Ho is 3.31 decimal feet at t = 0 sec
Bouwer and Rice Parameter A is 2.51107
Bouwer and Rice Parameter B is 0.47301
ln(Re/Rw) = 2.405612e+00
Analysis Starts at time 0.000000 seconds
Analysis Ends at time 130.000030 minutes
11 Measurements Analyzed from 1 to 11
Log of Head Ratio (Ho/Ht)
1
0.1
0.01
Hydraulic Conductivity = 3.49274e-06 cm/sec
Transmissivity = 0.495029 ft2/day
0
1
2
3
4
5
6
7
Adjusted Time (hours)

Data has not been saved

Title:	In-Situ Hydralic Condutivity Data
Site Name:	W.C. Meredith Facility
Location:	East Point, Georgia
Client:	
Project Number:	
Test Date:	5-6-90
Well Number:	MW-6R
Casing Radius:	0.083 feet
Effective Well Radius:	0.292 feet
Aquifer Thickness:	50 feet
Water Table to Screen Bottom:	13.76 feet
Screen Length:	10 feet
Static Water Level:	18.24 decimal feet

K ratio is 1
There are 16 time and drawdown measurements
Tests starts with trial 1
Time values will be adjusted by 0 days [0.000000 seconds]

Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (decimal feet)	Head (decimal feet)	Head Ratio
1	0	0	19.97	1.73	1
2	5	5	19.86	1.61999	0.936414
3	11	11	17.81	-0.430015	-0.248564
4	18	18	19.77	1.53	0.884395
5	24	24	19.74	1.50001	0.867061
6	31	31	19.68	1.44001	0.832376
7	36	36	19.63	1.39001	0.803475
8	42	42	19.63	1.39001	0.803475
9	60.0001	60.0001	19.5	1.25999	0.728319
10	140	140	19.3	1.05999	0.612714
11	169	169	19.33	1.09001	0.630066
12	241	241	19.22	0.980007	0.566479
13	341.001	341.001	19.09	0.849989	0.491324
14	441	441	19.01	0.770004	0.44509
15	542	542	18.95	0.709998	0.410404
16	747.999	747.999	18.86	0.620006	0.358385

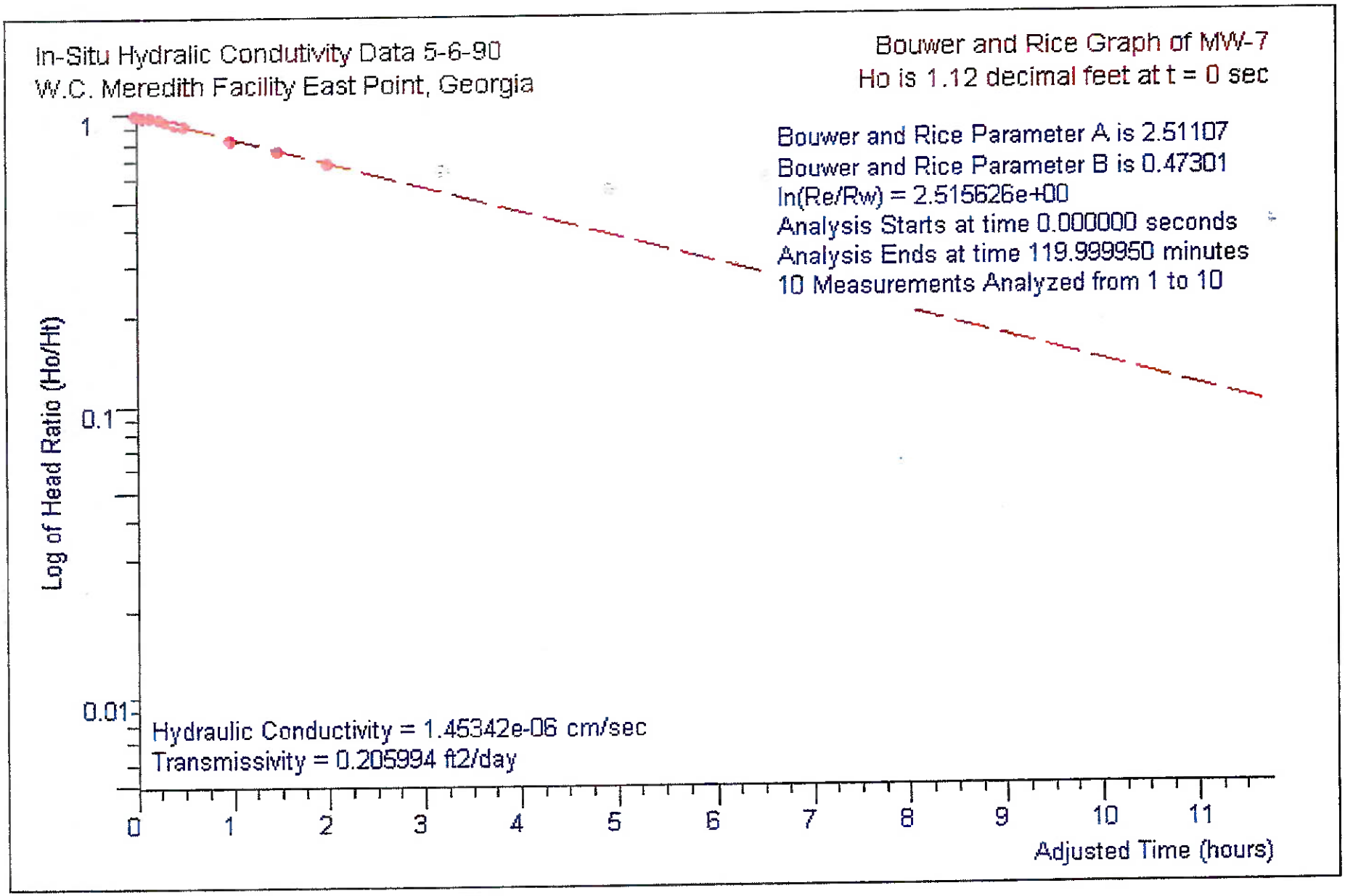

In-Situ Hydralic Condutivity Data 5-6-90
W.C. Meredith Facility East Point, Georgia
Bouwer and Rice Graph of MW-6R
Ho is 1.73 decimal feet at t = 0 sec
Bouwer and Rice Parameter A is 2.51107
Bouwer and Rice Parameter B is 0.47301
ln(Re/Rw) = 2.350610e+00
Analysis Starts at time 0.000000 seconds
Analysis Ends at time 60.000050 minutes
9 Measurements Analyzed from 1 to 9
1 points not plotted because head ratio <= 0.0
These points are not included in the analysis
Log of Head Ratio (Ho/Ht)
1
0.1
0.01
Hydraulic Conductivity = 2.05209e-06 cm/sec
Transmissivity = 0.290845 ft2/day
0
1
2
3
4
5
6
7
8
9
10
11
12
Adjusted Time (hours)

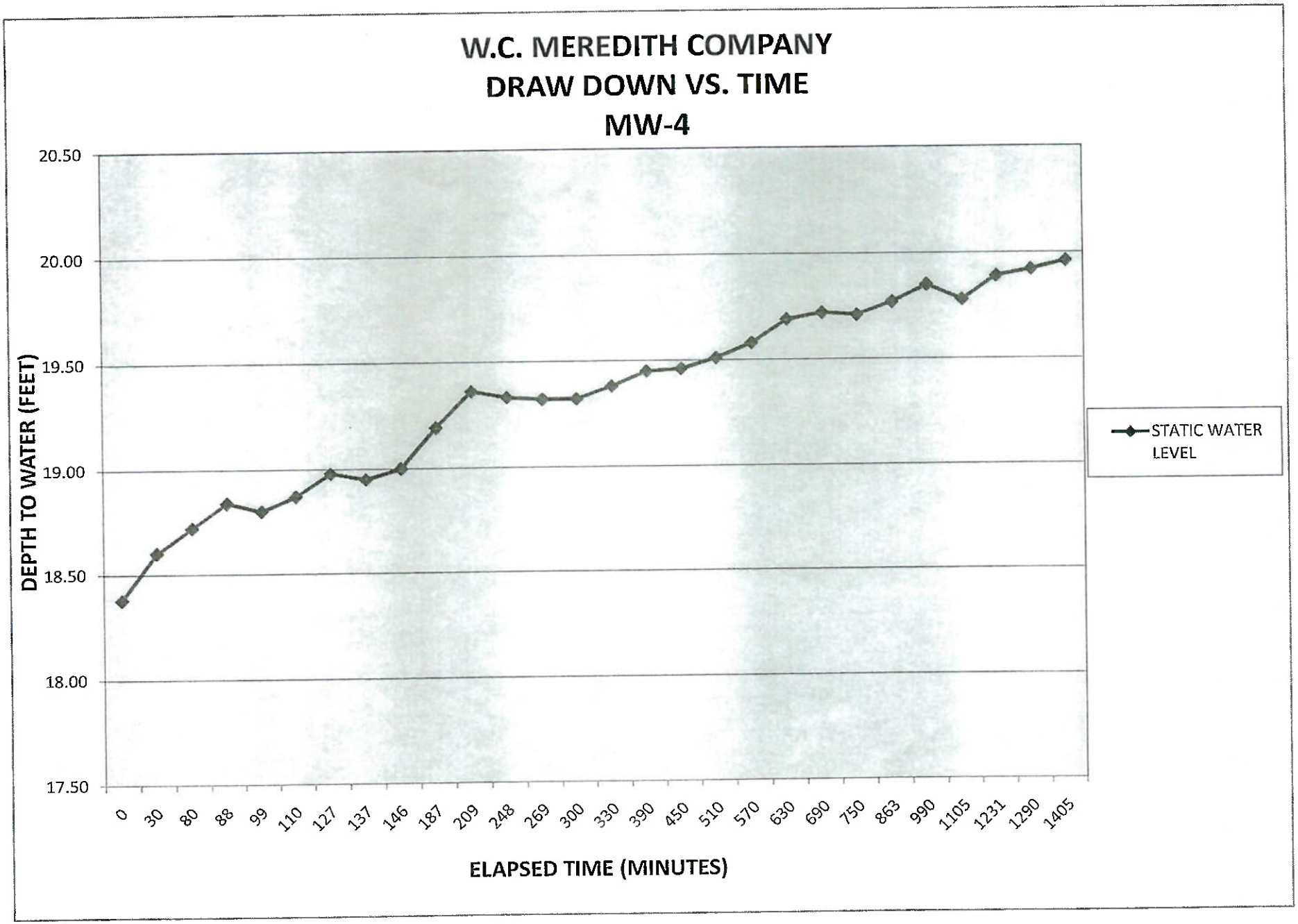
Data has not been saved

Title:	In-Situ Hydralic Condutivity Data
Site Name:	W.C. Meredith Facility
Location:	East Point, Georgia
Client:	
Project Number:	
Test Date:	5-6-90
Well Number:	MW-7
Casing Radius:	0.083 feet
Effective Well Radius:	0.292 feet
Aquifer Thickness:	50 feet
Water Table to Screen Bottom:	20.01 feet
Screen Length:	10 feet
Static Water Level:	15.99 decimal feet

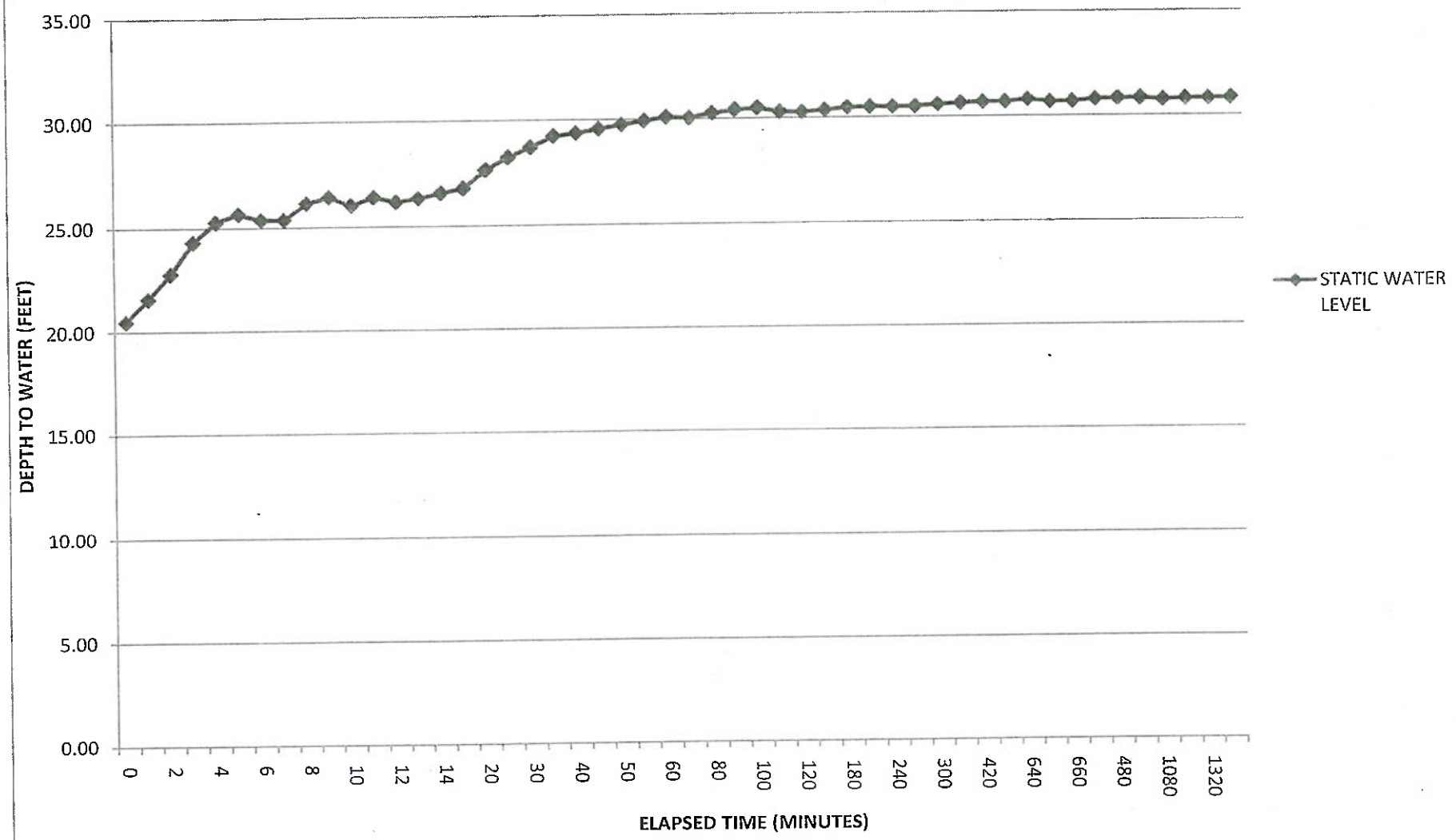
K ratio is 1
There are 15 time and drawdown measurements
Tests starts with trial 1
Time values will be adjusted by 0 days (0.000000 seconds)

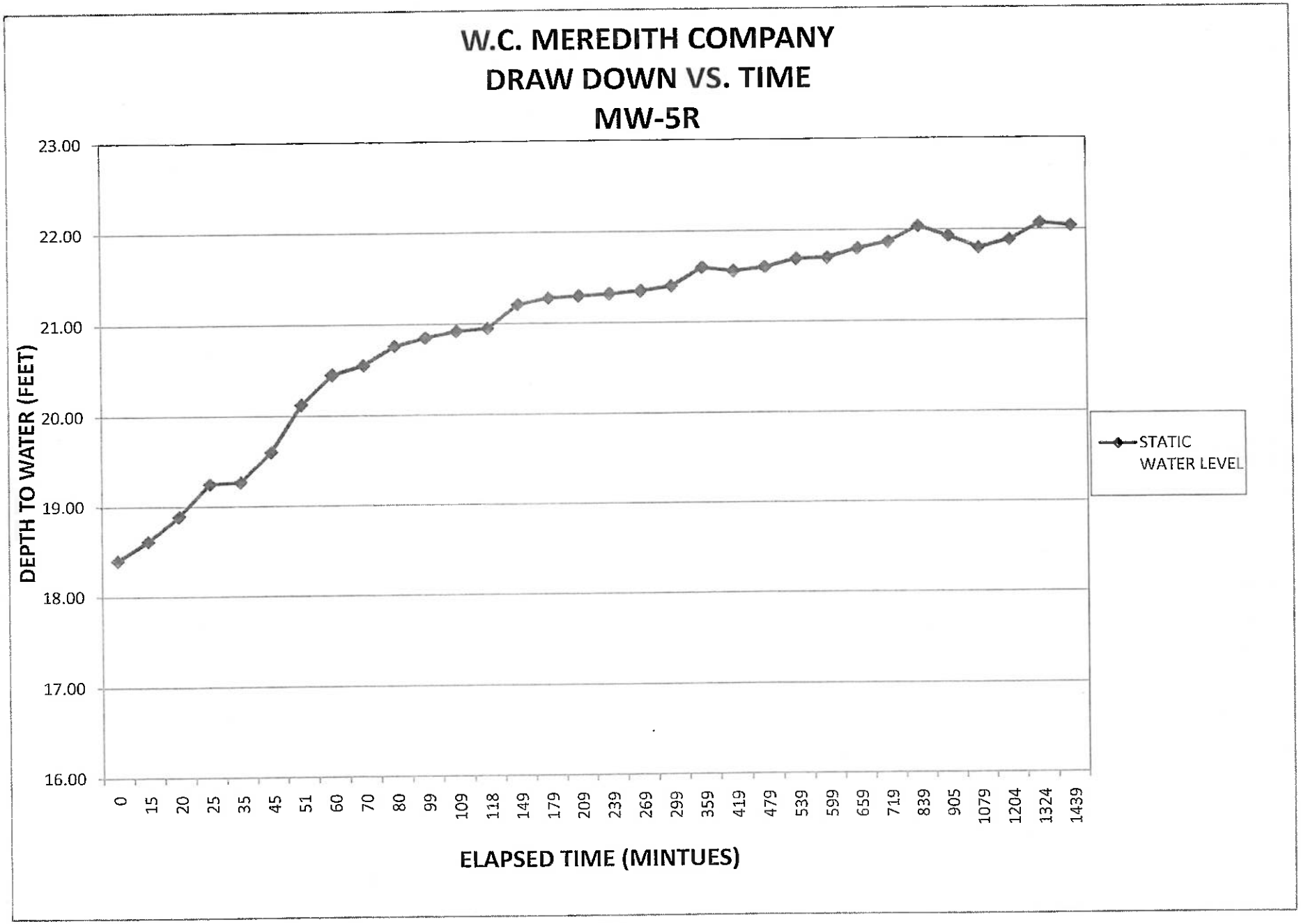
Trial	Time (minutes)	Adjusted Time (minutes)	Drawdown (decimal feet)	Head (decimal feet)	Head Ratio
1	0	0	17.11	1.12	1
2	5	5	17.09	1.10002	0.98216
3	9.99999	9.99999	17.08	1.09001	0.973226
4	15	15	17.06	1.07	0.955359
5	20	20	17.04	1.04999	0.937489
6	25	25	17.03	1.04001	0.928585
7	30	30	17.01	1.02	0.910716
8	60.0001	60.0001	16.9	0.909995	0.812496
9	90	90	16.82	0.83001	0.741081
10	120	120	16.75	0.759999	0.67857
11	192	192	16.7	0.709998	0.633927
12	296.001	296.001	16.6	0.61	0.544643
13	393	393	16.65	0.659998	0.589284
14	495	495	16.5	0.510002	0.455359
15	704.999	704.999	16.44	0.449996	0.401782


In-Situ Hydralic Condutivity Data 5-6-90
W.C. Meredith Facility East Point, Georgia
Bouwer and Rice Graph of MW-7
Ho is 1.12 decimal feet at t = 0 sec
Bouwer and Rice Parameter A is 2.51107
Bouwer and Rice Parameter B is 0.47301
ln(Re/Rw) = 2.515626e+00
Analysis Starts at time 0.000000 seconds
Analysis Ends at time 119.999950 minutes
10 Measurements Analyzed from 1 to 10
Log of Head Ratio (Ho/Ht)
1
0.1
0.01
Hydraulic Conductivity = 1.45342e-06 cm/sec
Transmissivity = 0.205994 ft2/day
0
1
2
3
4
5
6
7
8
9
10
11
Adjusted Time (hours)

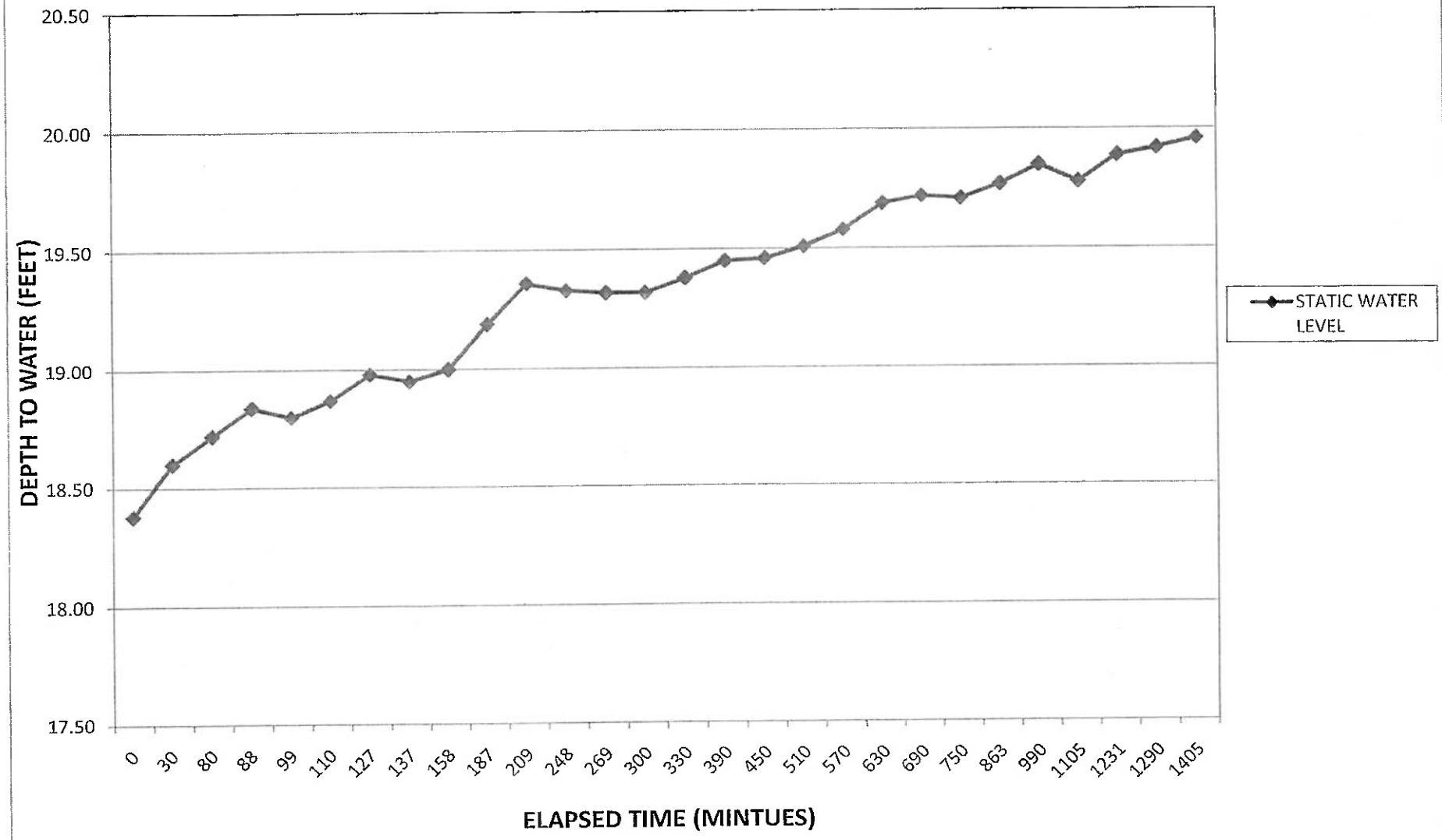

W.C. MEREDITH COMPANY
DRAW DOWN VS. TIME
MW-4
DEPTH TO WATER (FEET)
20.50
20.00
19.50
19.00
18.50
18.00
17.50
0
30
80
88
99
110
127
137
146
187
209
248
269
300
330
390
450
510
570
630
690
750
863
990
1105
1231
1290
1405
ELAPSED TIME (MINUTES)
STATIC WATER LEVEL

W.C. MEREDITH COMPANY
DRAW DOWN VS. TIME
PW-1

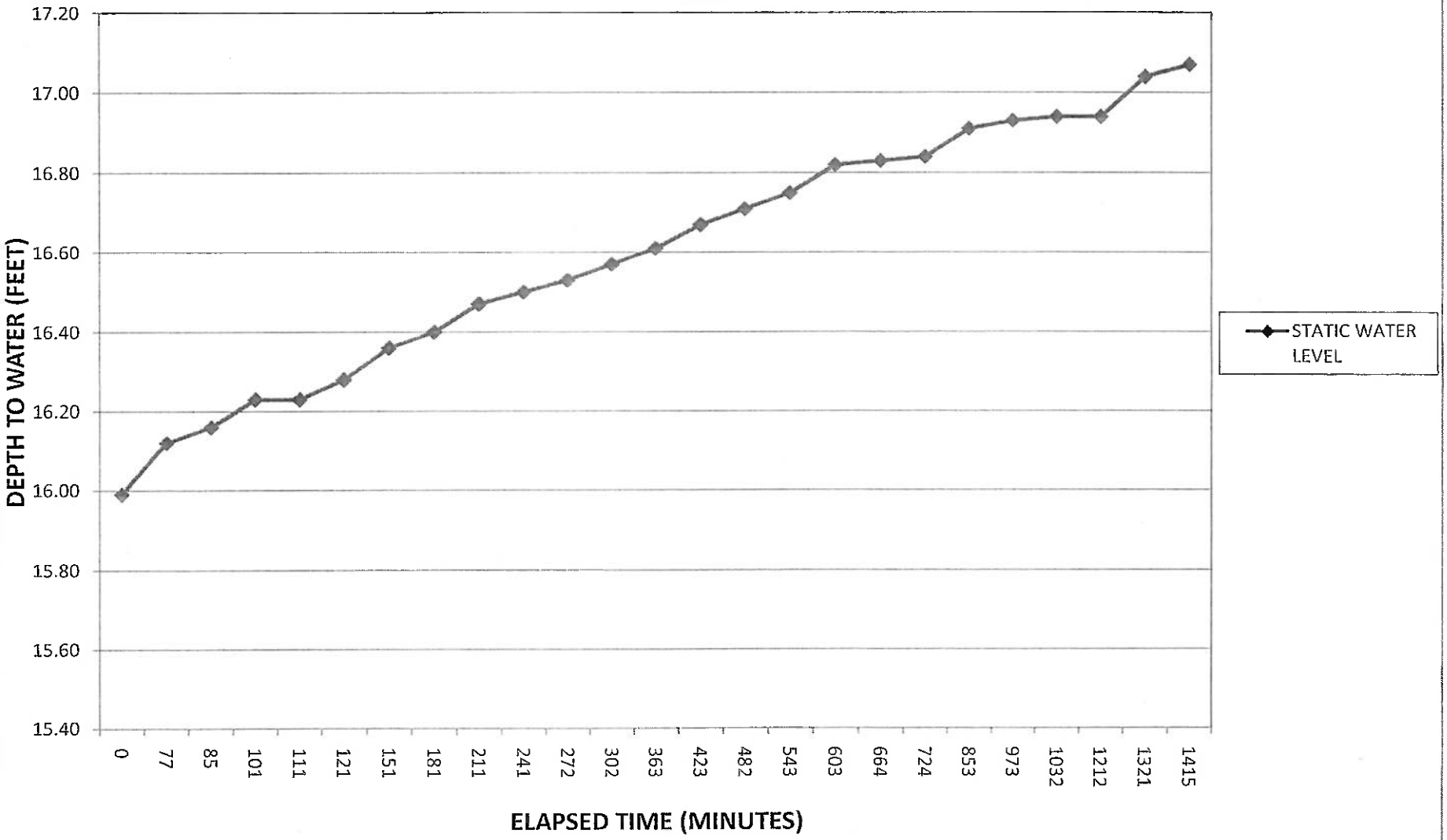



W.C. MEREDITH COMPANY
DRAW DOWN VS. TIME
MW-5R
DEPTH TO WATER (FEET)
23.00
22.00
21.00
20.00
19.00
18.00
17.00
16.00
0
15
20
25
35
45
51
60
70
80
99
109
118
149
179
209
239
269
299
359
419
479
539
599
659
719
839
905
1079
1204
1324
1439
ELAPSED TIME (MINTUES)
STATIC WATER LEVEL

W.C. MEREDITH COMPANY
DRAWN DOWN VS. TIME
MW-6R



W.C. MEREDITH COMPANY
DRAW DOWN VS. TIME
MW-7



WILLIAM C. MEREDITH CO., INC.
EAST POINT, GEORGIA

AQUIFER TEST

18 MARCH 1991

A test well, PW1, was constructed between MW5 and MW7 on 12 December 1989 to determine aquifer parameters to be used in corrective action studies. The depth of the well was 43.0 feet and the well screen and riser was 4" diameter stainless steel. Figure 1 shows well details. The aquifer test was begun at 1055 hours on the morning of 5 May 1990 and pumping continued uninterrupted until 1105 on 6 May 1990 for a total elapsed time of 24 hours 10 min. Recovery was measured until 2000 hours on 6 May 1990. A total of 4,114.7 gallons were pumped for an average of 2.84 gpm. Pump intake was set at 33.4' below casing, just above the top of screen (35.0'). Static water level was 17.97 and the maximum drawdown level was approximately 30.8 feet for a total drawdown of about 12.8 feet. All wells within an approximate 100' radius of PW1 showed the effects of the pumping well. These drawdowns varied from 3.64' at MW5, 25' east of PW1 to .79' at MW8, 100' north of PW1. See table 1.

Using the Jacob method for data analysis values for T and S were derived from time drawdown data for wells MW5 and MW6. The transmissivity (T) was found to be approximately 800 gpd/ft while the storativity (S) averaged .0025

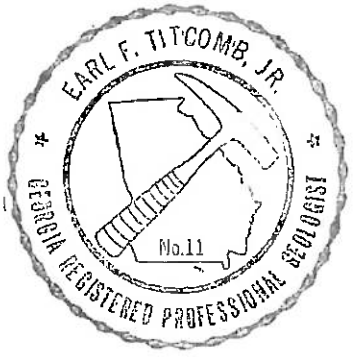
Based on the results of the aquifer test it appears that PW1 pumping at a rate of approximately 3 gpm will capture essentially the entire width of the contaminated plume. There was only a very slight effect at MW9, however this well is located very near the limit of the plume. It is recognized that this well, PW1, is not designed to recover the deeper contaminated zone, however it does appear that it can meet the objectives of recovering the shallow contamination.

EARL F. TITCOMB, JR.
GEOLOGY CONSULTANT

WILLIAM C. MEREDITH COMPANY
INCORPORATED

APPENDIX C

DETAILED PLANS AND AN
ENGINEERING REPORT DESCRIBING
THE CORRECTIVE ACTION
TO BE TAKEN
BY
EARL TITCOMB, JR. - CONSULTING GEOLOGIST
PAUL CASTLE - W.C. MEREDITH CO., INC.



Technical Analysis prepared by:

Earl F. Titcomb, Jr.
GA Professional Geologist #11

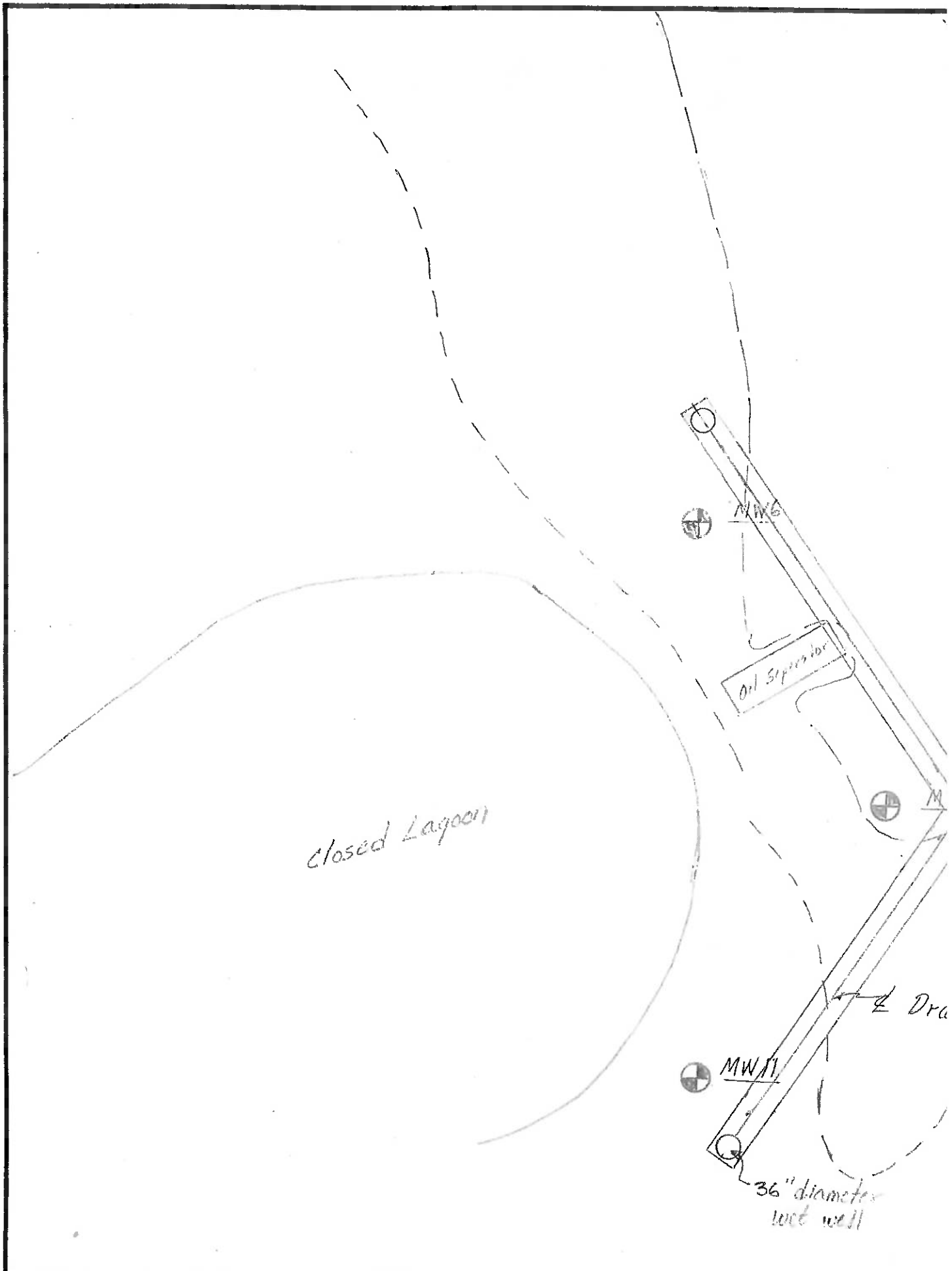
18 Nov 1991
Date

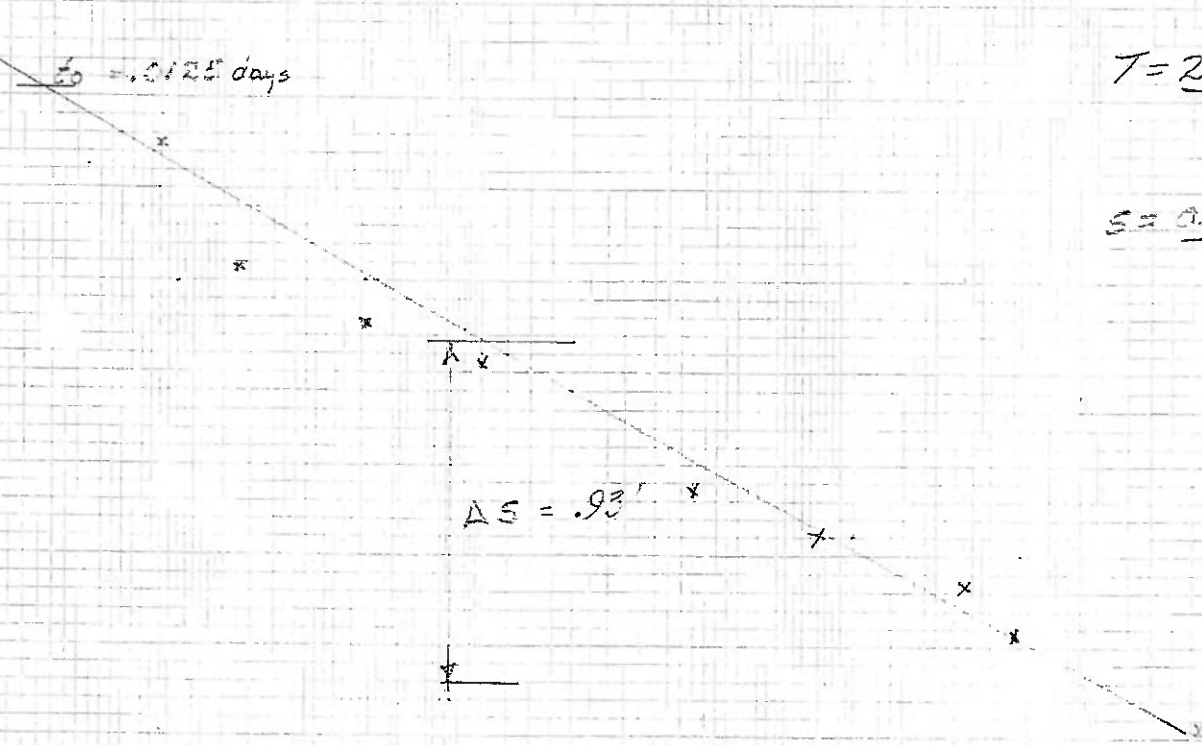
W. C. Meredith

Aquifer Test Data - etc for Corrective Action Plan.

	Distance to PW1	5 May Time	Initial Reading	Time	Final Reading	Max Dwn
MW 1	650	0926 hrs	24.41'	1047 hrs	24.45'	.04'
MW 2	340	0849	19.53	1041	19.65	.08
3	155	0852	14.67	1035	14.78	.11
4	230	0850	12.00	1042	12.14	.14
5	20	0854	8.40	1055	22.04	3.64
6	48	0951	18.24	1050	19.96	1.72
7	63	0853	15.99	1030	17.07	1.08
7A	53	0851	2.15	1036	19.37	1.18
8	101'	0903	1938	1036	20.17	.79
9	130	0844	18.46	1033	18.77	.31
10	265'	0915	2145	1038	21.67	.22
11	79	0856	16.62	1100	18.34	1.72
PW1	0	1005	17.97	1055	30.84	12.87

Table 1



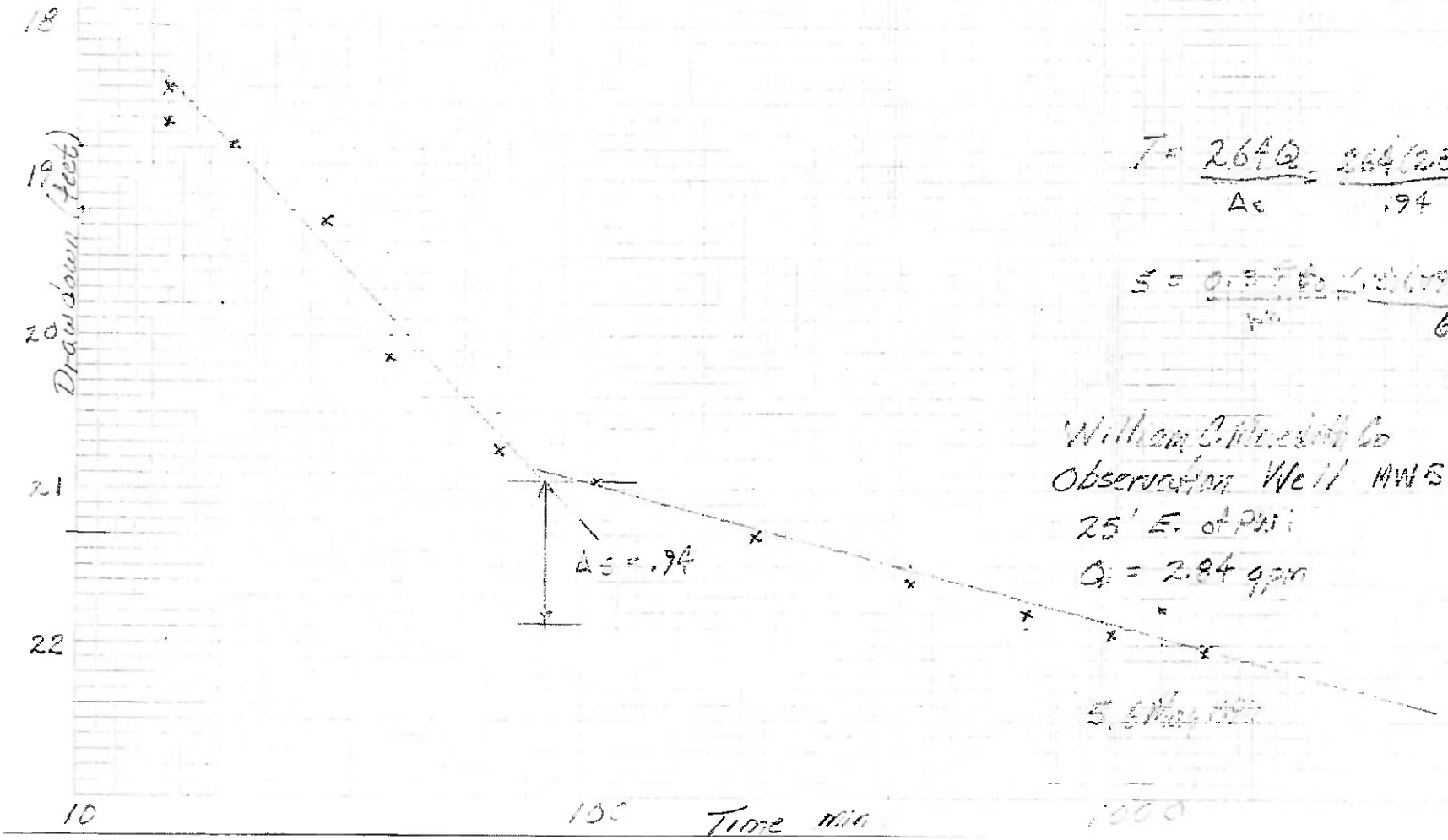


$$T = \frac{264Q}{\Delta s} = \frac{806.2}{} \text{ gpd/ft}$$

$$S = \frac{0.3 T t_0}{r^2} = \frac{3.02}{2304} = .0013$$

William E. Kendrick Co.
Observation Well MW6
48'5" of PVC
Q = 2.84 gpm
5.6 days (80%)

Figure 2



$$T = \frac{26fQ}{\Delta s} = \frac{264(2.84)}{.94} = \frac{1976}{gpd/ft}$$

$$S = \frac{0.3 \cdot T t_0}{r^2} = \frac{.3(1976)(.01)}{625}$$

$$.0038$$

William C. Attwood Co
Observation Well MW 5
25' E. of PW 1
Q = 2.84 gpm

Figure 3

County : Fulton
Location: W.C. Meredith Co

Observation well no. PW1
Pumped well no. PW1

Average Q _____ gpm r = _____ ft. r^2 = _____ SWL 17.97 ft

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment Δs	s' (adjusted)	Q (gpm)	Meter Remarks
5 May	1055	30 sec			20.49					6303.5
		60			21.58					
		90			22.41					
		120			22.78					
		150			23.10					
	30 sec	180			24.32					
		210			24.89					
		240			25.28					
		270 sec	5		25.51 ✓					
		5 min			25.65				4.0	6323.5
		6			25.38					
		8			25.38					
		9			26.16					
		10			26.44					
	1 min	10			26.04					
		13			26.42					
		12			26.19					went to tank
		15			26.35					
		14	15		26.60					
		16			26.81					
	1115	20			27.67				3.4	6374.5
	5 min	25			28.26				3.5	6392.0
		30			28.73					6409.2
		35			29.25					
		40			29.38				3.5	6444.0

Figure 3.—Continued.

26.35
17.97
8.38 ?
casing storage

24.5 min 6400

AQUIFER-TEST DESIGN, OBSERVATION, AND DATA ANALYSIS

County : Fulton
Location: W. C. Meredith

Observation well no. _____
Pumped well no. PW 1

Average Q _____ gpm r = _____ ft. r^2 = _____

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment As	s' (adjusted)	Q (gpm)	Remarks
5 May		45			29.58					6461.0
	1150	50			29.76					6488.2
		55	5		29.92					6496.0
	1155	60	↓		30.10				3.5	6513.6
	1205	70	↑		30.06			↑		6546.0 1157 adj water closet
	1215	80			30.27				3.3	6579.0 1206 adj bath
	1225	90			30.42				3.2	6611
	1235	100	10 min		30.50			3.16		6642.6
	1245	110			30.30					6673.
	1255	120	↓		30.28			↓		6703.1
	1325	150	↑		30.37			↑	3.0 gpm	6793.0
	1355	180	30 min		30.48					6882.5
	1425	210			30.50			3.05 gpm		6971.4
	1455	240			30.49				3.25	7069.0
	1525	270			30.51					7146.9 2.6
	1555	300	↓		30.59				2.9	7233.7
	1655	360	6 hrs		30.65				2.9	7406.2
	1755	420	7		30.69				2.9	7528.0
	1855	480	8		30.70				2.8	7748.0
	1955	540	9		30.80				2.8	7918.6
	2055	600	10		30.69					8095.0
	2155	660	11		30.75					8025.0 ?
5 May	2255	720	12 hrs		30.80					8423.0
6 May	55	840	14		30.83					8755.0
	255	960	16		30.84					9
	455	1080	18		30.77					9415.8
	655	1200	20		30.81					9731.0
	855	1320	22		30.82					10067.0
	1055	1440	24		30.84					104

Figure 3.—Continued.

AQUIFER-TEST DESIGN, OBSERVATION, AND DATA ANALYSIS

County : Fulton
Location: W.C. Meredith Co

Observation well no. PW 1
Pumped well no. _____

Average Q Recovery gpm r = _____ ft. r^2 = _____ 3084' 0 readings

Date	Hour	t (min)	Read (ft)	Min t/t'	Depth to water	s (unadjusted)	Adjustment As	s' (adjusted)	Q (gpm)	Remarks
6 May	1105	½ 30 sec	1		29.76				0	10418.2 = 4114.7 gpd
	6	60	2		29.16	?				
		120	3		28.86					
	1107.5	180	4		28.48					
	.5	150	5	30 sec	28.27	30 ft				
	1108	180	6		28.02					
		210	7		27.77					
	1109	240	8		27.46					
		270	9		27.08					
	1110	300 5 min	10	5	26.75					
	1111	360 1	11	6	26.13					
	12	120	12	7	25.53					
	13	480	13	8	24.98					
	14	540	14	9	24.39					
	1115	600	15	10	24.00	1 min				
	16	660	16	11	23.59					
	17	720	17	12	23.30					
	18	780	18	13	23.12					
	19	840	19	14	22.87					
	1120	900	20	15	22.71					
	1125		21	20	22.09	4				
	30		22	25	21.66					
	35		23	30	21.35					
	40		24	35	21.08	5 min				
	45		25	40	20.86					
	50		26	45	20.71					
	55		27	50	20.57					
	1200		28	55	20.44					
	1205		29	60	20.35					

Figure 3.—Continued.

AQUIFER-TEST DESIGN, OBSERVATION, AND DATA ANALYSIS

County : Fulton
Location: W.C. Meredith

Observation well no. ____
Pumped well no. PW1

Average Q Recovery gpm r = ____ ft. r^2 = ____

Date	Hour	Sec (min)	Reading (ft)	Min t/t'	Depth to water	s (unadjusted)	Adjustment Δs	s' (adjusted)	Q (gpm)	Remarks
5 May 90	1235		30	90	19.99					
	1301			120	19.[illegible]					
	1335			150	19.[illegible]					
	1405			180	19.30					
	1505			240	19.[illegible]					90% recovered
	[illegible]			[illegible]	18.96					
	[illegible]			360	18.8[illegible]					
	1911			420	18.49					96%

Figure 3.—Continued.

30.83 − 12.86 = 17.97
30.83 − 19.21 = 11.62
5
86
30.83 − 18.49 = 12.34
92.1
7.97
1.241

County : Fulton
Location: W.C. Meredith

Observation well no. MW5
Pumped well no. PW1

Average Q _____ gpm r = _____ ft. r^2 = _____

SWL - 18.40

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment As	s' (adjusted)	Q (gpm)	Remarks
5 May	11:11	15			18.61					RECOVERY 11:25 21.71
	11:16	20			18.93					11:30 21.49
		25			19.25					11:36 21.27
		30			19.27					11:43 21.12
	11:41	35			19.60					11:50 20.94
	11:47	40			20.12					11:57 20.75
	11:56	45			20.45					12:02 20:67
	12:06	55			20.55					12:06 20:53
	12:16	65			20.76					12:25 20.25
	12:35				20.85					~~RETRIEVE - INSTRUMENT~~ 13 06 19.79
	12:45				20.92					13:30 19.52
	12:54				20.95					14:05 19.40
	13:25				21.21					~~RETRIEVE~~ 1505 19.28
	13:55				21.28					1605 19.07
	14:25				21.30					1705 18.94
	14:55				21.32					1914 18.82
	15:25				21.35					
	15:55				21.40					
	16:55				21.60					~~SHUT IN RECORDER~~
	17:55				21.56					
	18:55				21.60					
	19:55				21.69					
	20:55				21.70					
	21:55				21.85					
	22:55				21.87					
	24:55				22.04					

Figure 3.—Continued.

6 May 0455 21.93
0700 21.89
0900 22.07
1055 22.04

County : Fulton
Location: W.C. Meredith

Observation well no. MW 6
Pumped well no. PW 1

Average Q _____ gpm r = _____ ft. r^2 = _____ 18.29

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment Δs	s' (adjusted)	Q (gpm)	Remarks
5 May		30			18.32					Recovery
	11:10	35			18.66					11:27 1997
	11,58	40			18.72					11:32 19.26
	11.48	45			18.64					11:38 19.81
	12:09	1 05			18.80					11:44 19.77
	12:20	1 15			18.87					11:51 19.14
	12:39				18.98					11:58 19.67
	12:51				18.96					12:03 19.63
	12-56				19.00					12:09 19.63
	13:37				19.19					30 min 12.32 19.00
	13:59				19.36					Restored 13:41 19.30
	14:38				19.33					13.36 19.32
	14:59				19.32					14:36 19.32
	15:30				19.32					1508 19.29
	16:00				19.31					1609 19.31
	17:00				19.32					1709 18.95
	18:00				19.42					1915 18.95
	19:00				19.51					
	20:00				19.58					
	21:00				19.69					
	22:00				19.72					
	23:00				19:71					
	24				19.72					
	0:30				19.84					
	01:00				19.76					

Figure 3.—Continued.

0700 19.92
10:30 19.92

80.05
1/19

County : Fulton
Location: W. C. Meredith

Observation well no. MW 7
Pumped well no. PW1

Average Q_____ gpm r=_____ft. r^2=_____

WL 15.99 0835 hrs

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment Δs	s' (adjusted)	Q (gpm)	Remarks	
5 May	1210				16.12					Recovery	
	1220				16.16				6 May	11.37 hrs	17.11
	1236				16.23					1142	17.09
	1246				16.23					1147	17.08
	1256				16.28					1152	17.06
	1326				16.36					1157	17.04
	1356				16.40					1202	17.03
	1426				16.47					1207	17.01
	1456				16.50					1237	16.90
	1527				16.53					1307	16.82
	1557				16.57					1337	16.75
	1658				16.61					1469	16.70
	1757				16.67					1513	16.60
	1857				16.71					1610	16.65
	1958				16.75					1712	16.50
	2058				16.82					1919	16.44
	2159				16.83						
	2259				16.84				7 May	0739 hrs	16.41
6 May	0108				16.91						
	0308				16.93						
	0507				16.94						
	0707				16.94						
	0856				17.04						
	1030				17.07						

Figure 3.—Continued.

Pump on 1055, 5 May 90
off 1105, 6 May 90

County : Fulton
Location: W.C. Meredith

Observation well no. MW9
Pumped well no. PW1

Average Q_____ gpm r = _____ ft. r^2 = _____

Date	Hour	t (min)	t′ (min)	t/t′	Depth to water	s (unadjusted)	Adjustment Δs	s′ (adjusted)	Q (gpm)	Remarks
5 May	1212	117			18.46					Recovery
	1222				18.47				6 May	1207 18.75
	1238				18.47					1240 18.75
	1248				18.48					1310 18.76
	1258				18.47					1340 18.77
	1328				18.47					1411 18.73
	1358				18.48					1515 18.71
	1428				18.51					1613 18.70
	1500				18.49					1714 18.68
	1530				18.50					1922 18.70
	1600				18.51					
	1701				18.52				7 May	0136 18.76
	1800				18.53					
	1900				18.55					
	2001				18.64					
	2100				18.67					
	2203				18.69					
	2303				18.66					
6 May	0111				18.67					
	0314				18.60					
	0509				18.66					
	0712				18.73					
	0859				18.75					
	1033				18.77					

Figure 3.—Continued.

Pump on 1055, 5 May 70
off 1105, 6 May 70

County : Fulton
Location: W. C. Meredith

Observation well no. MW11
Pumped well no. PW1

Average Q _____ gpm r = _____ ft. r^2 = _____ WL 16.62' 0953hrs

Date	Hour	t (min)	t' (min)	t/t'	Depth to water	s (unadjusted)	Adjustment Δs	s' (adjusted)	Q (gpm)	Remarks	Recovery
5 May	1137	30			17.56						11:30 18:43
	11:45	45			17.80						11:39 18:26
	11:54	40			17.82						11:41 18:33
	11:59				17.92						11:47 18:30
	12:12				17.93						11:55 18:27
	12:25	65			17.94						11:57 18:34
	12:40				17.92						12:06 18:25
	12:50				17.93						12:14 18:24
	13:00				18.01						12:30 18:20
	13:30				18.01						12:47 18:11
	14:00				18.14						13:34 18:07
	14:30				18.14						14:10 18:07
	15:00				18.13						1510 17.98
	15:30				18.07						1610 17.98
	16:00				18.13						1710 17.83
	17:00				18.11						1916 17.83
	18:00				18.13						
	19:00				18.12						
	20:00				18.19						
	21:00				18.20						
	22:00				18.24						
	23:00				18.24						
6	2955				18.16						
	3055				18.20						
	3155										

Figure 3.—Continued.

702 East 44th Street
Savannah, Georgia 31405
December 29, 1988

Mr. Victor Barr
Georgia Department of Natural Resources
205 Butler Street, S. E.
Suite 1252
Atlanta, Georgia 30334

Dear Mr. Barr:

In compliance with Section III.E of William C. Meredith Company's permit HW-062D, I am submitting the following data on their corrective actions program.

The initial studies were begun on December 22, 1988, by the excavation of a test trench adjacent to MW5, the area thought to be most contaminated. The purposes of this trench were to further define the nature of the subsurface materials in the vicinity of the compliance point, to determine if MW5 had encountered any unusual pockets or concentrations of K001 contaminants, and to test the practicality of constructing an infiltration trench.

A Drott 40 BEC backhoe was used for the construction. The bucket used was about 30 inches in width and was about 1 CY capacity. Digging began six feet from MW5 and was extended toward the east about 30 feet. Due to the recent lowering of the water table it was necessary to bench down several times in order to reach below the water table, since the reach of the backhoe arm was only 19.5 feet. Total length of the completed trench was 24 feet at the surface; total depth was 27 feet.

The excavation reveals conditions to be as had been reported by W. C. Meredith, the company founder. He had indicated that many rubble blocks, bricks, etc., had been used to raise the area around the retention pond. This very quickly became apparent as the test trench progressed. The upper portion from about 0 to 10 feet in depth consisted of red to green-gray micaceous silts containing wood, electrical wire, etc. As the trench was enlarged, rocks, wood timbers, cable, reinforcing bar, sheet metal, masonry, asphalt, granite dimension stone, wood fibers, cans, bits of glass, etc., were encountered. Most soil had a creosote odor but only a few black pieces of creosote soaked wood and soil were observed.

At 14 feet, what appeared to be an old wooden box and cardboard soaked with creosote were found. At the end of the trench near MW5 several voids up to 6 inches in diameter were found 13 to 14 feet in depth. Top of natural ground was found about 23 feet in depth; here there was a sandy,

green-gray clay with some black, creosote soaked areas. At about 25 feet rock structure (mineral bonding) could be observed although the materials were totally decomposed to a sandy micaceous soil. These soils did not exhibit the black creosote areas but had a noticeable odor. The trench sides were relatively stable, with slumping only occurring where the largest concentration of large debris was found, i.e., the northeast corner. Approximately 20 minutes after completion, free water was observed seeping into the bottom of the trench. Due to safety considerations, the trench was backfilled prior to darkness.

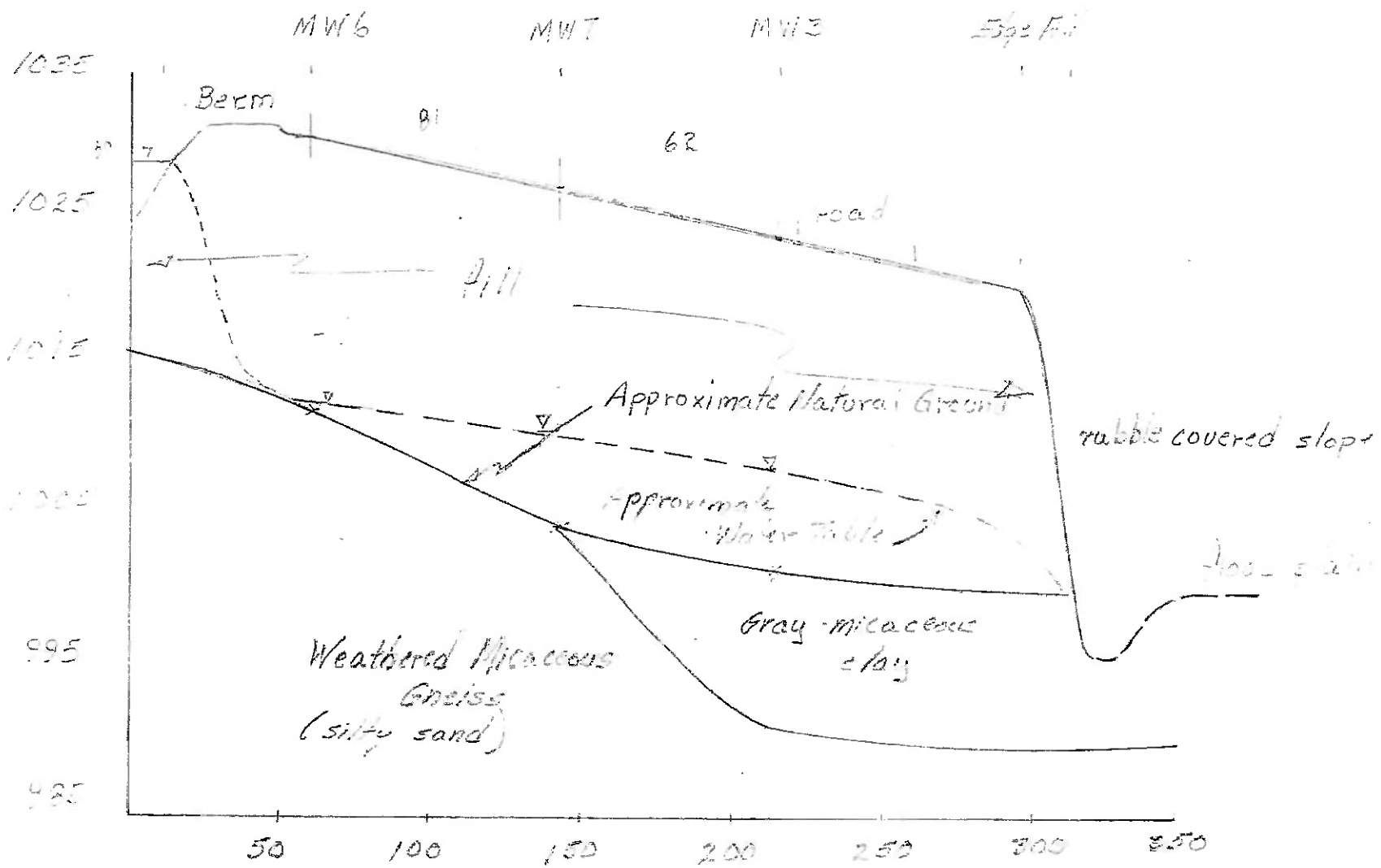
The test excavation confirmed the nature of the subsurface to be essentially as previously reported. Types of materials, depths to natural ground and water table were as anticipated. No large discreet pockets of contamination were encountered, however evidence of creosote/penta was found as described. Removal is feasible with the equipment utilized and an infiltration trench could be constructed, with some difficulty. Since free creosote and/or penta was found in pockets near the present water table, a trench would allow at least some movement of even the more viscous material into the open voids along with the water. This could be removed through sumps.

The corrective action studies should continue by the construction of an additional test trench near MW6 to further define subsurface conditions. This should be done as soon as the biological treatment cells have completed treatment, now estimated to be about February or March, 1989. The final corrective action selected will depend upon results of this additional study. At present the removal and/or the use of an infiltration trench appear to be the most feasible, effective option although other actions such as pumping will also be evaluated.

Very truly yours,

Earl F. Titcomb, Jr.
Geology Consultant

CF:
William C. Meredith Co.

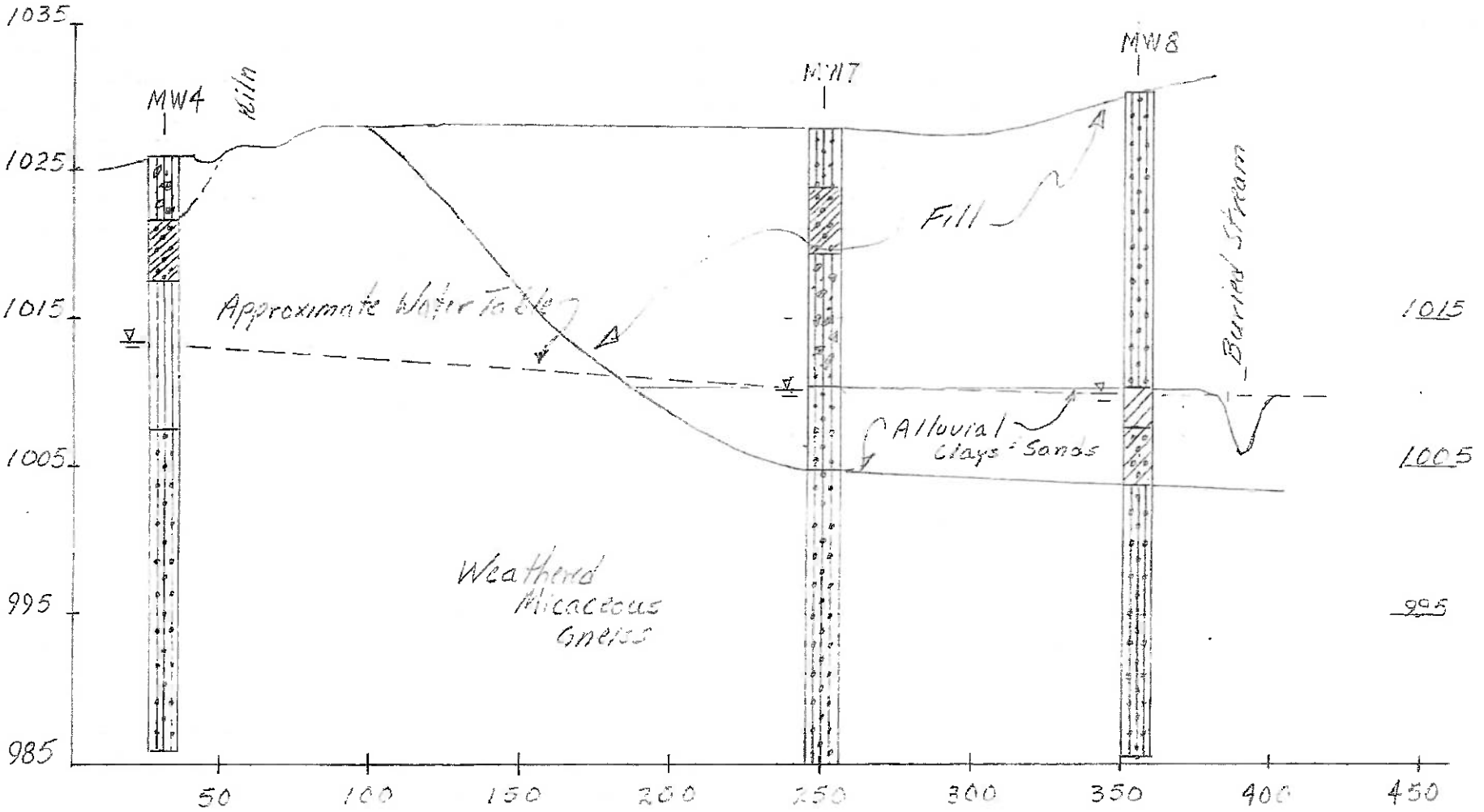


Geologic Section N 35° W
A — A'

Vertical Scale 1" = 10'
Horizontal Scale 1" = 50'

Figure 2

William C. Alexander Co.

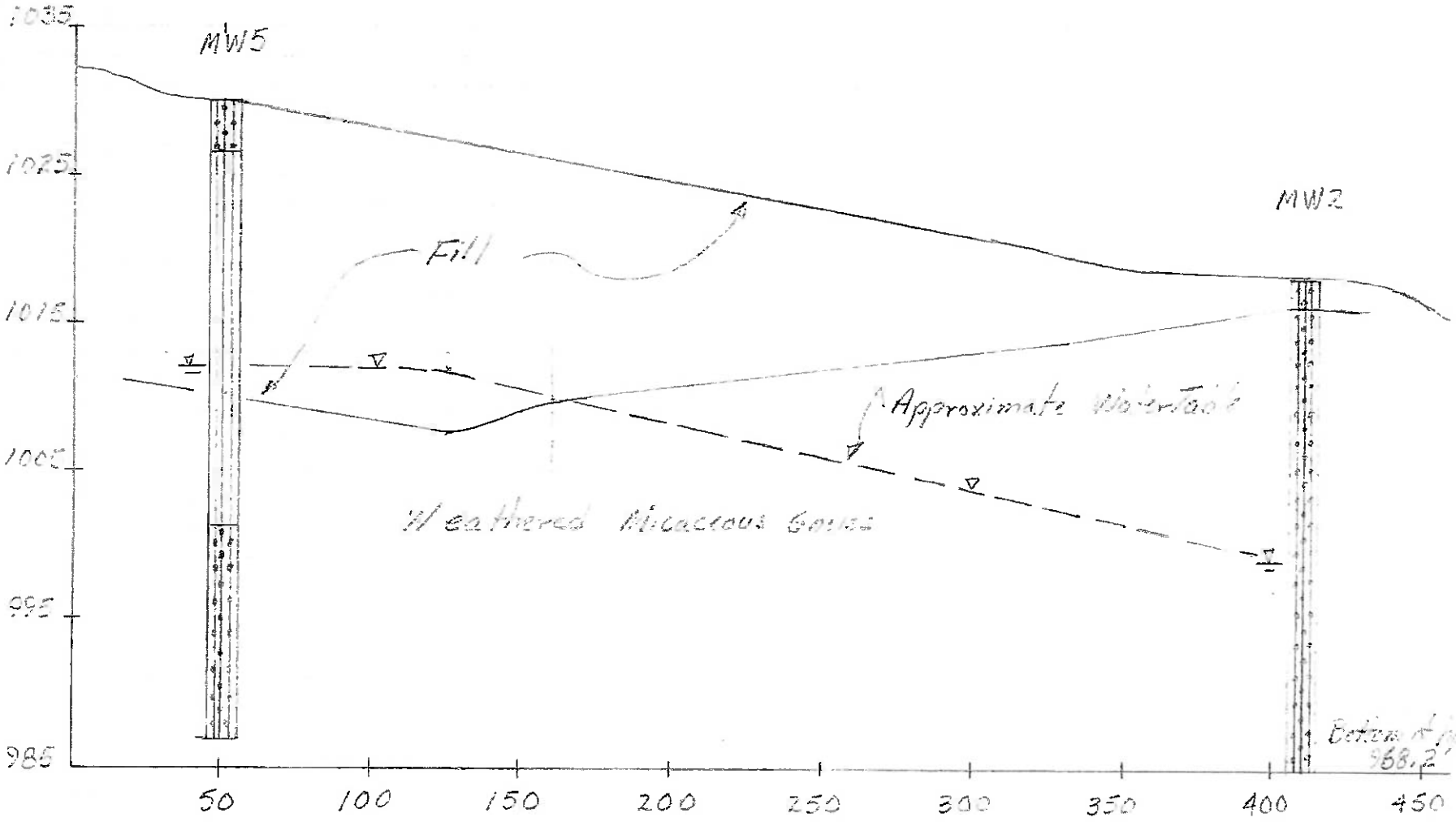


Geologic Section N 50° E

C - C'

Vertical Scale 1" = 10'

Horizontal Scale 1" = 50'



Geologic Section N 80° W

D - D'

Vertical Scale 1" = 10'

Horizontal Scale 1" = 50'

MONITORING WELL ELEVATIONS

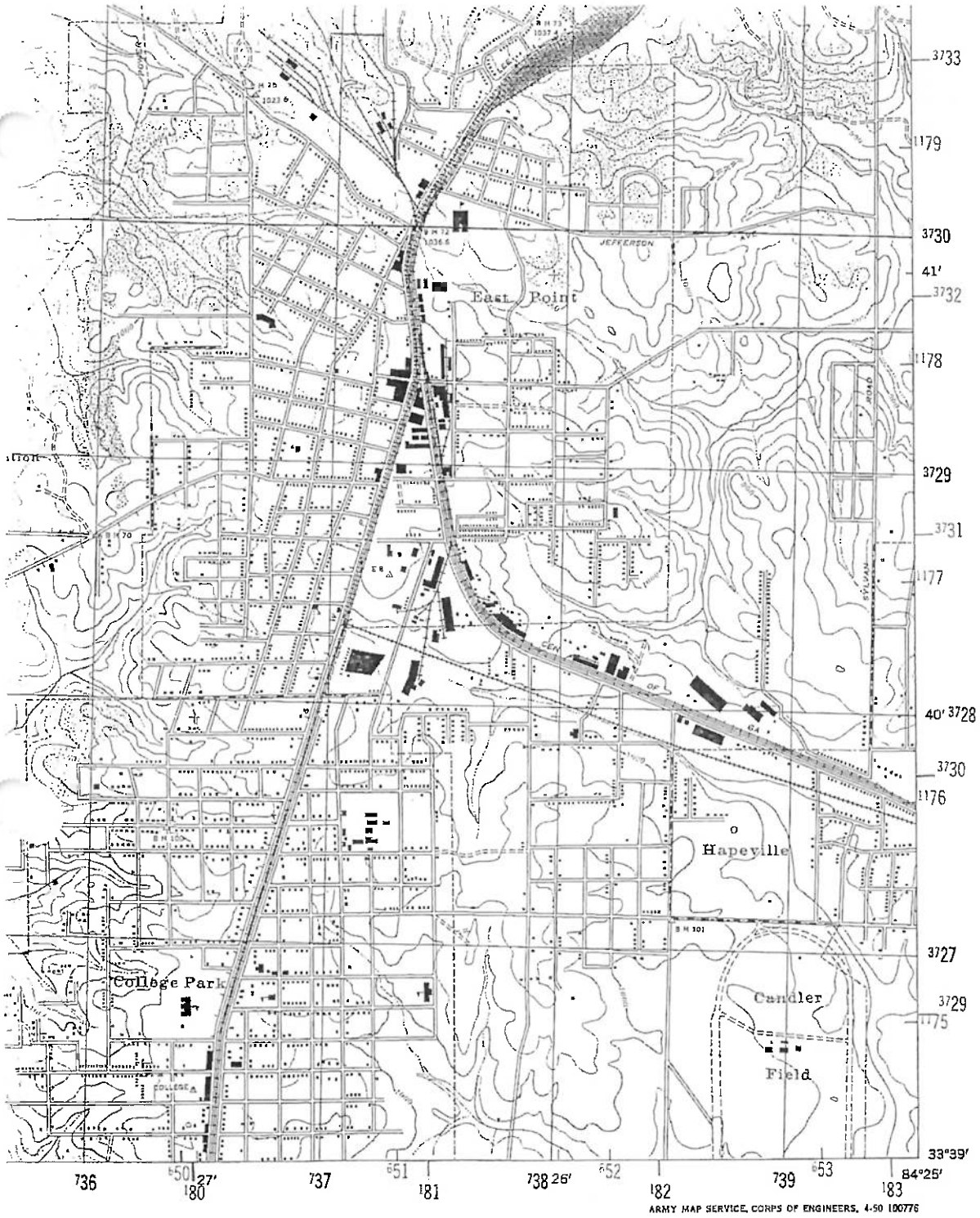
	8-18-89	11-13-89	1-31-90 (recheck)	4-30-90
MW1	27' 1"	27' 4"	~~27'~~ (26' 10 1/2")	24' 5"
MW2	21' 7"	21' 1 5/8"	18' 8" (18' 8")	19' 6 1/2"
MW3	16' 7 1/4"	16' 8 1/2"	16' 1 1/2"	14' 8 5/8"
MW4	14' 11 1/2"	14' 11"	11' 1 3/4" (11-1 3/4")	11' 8 7/8"
MW5	19' 5"	19' 4 3/4"	19' 1"	18' 2 1/4"
MW6	20' —	20' —	19' 6 1/4"	18' 3/4"
MW7	17' 10"	17' 11 1/2"	17' 3"	16 0
MW7A	20' 1"	20' 2 3/8"	19' 4 1/4"	18' 3 1/4"
MW7B	21' 5"	21' 6"	20' —	19' 3 1/4"
MW8	20' 10 1/4"	21' 1/4"	20' 9 1/4"	19' 4 3/4"
MW9	20' 8 1/4"	20' 8 3/8"	19' 7"	18' 4 7/8"
MW10	23' 1"	23' 2 7/8"	22' 11 1/4"	21' 5 1/4"
MW11	19' 1 1/4"	19' 4 1/8"	18' 8 3/4"	17' 5"
		1PM TO 3PM	10AM - 12 NOON	

↑ new elevation 1 foot lower cap

vent holes

1
10
11
7B

PW1



ARMY MAP SERVICE, CORPS OF ENGINEERS, 4-50 100776

TO GIVE A STANDARD REFERENCE ON THIS SHEET TO NEAREST 100 METERS		
SAMPLE POINT: GEORGIA SANITARIUM		
1. Locate first VERTICAL grid line to LEFT of point and read LARGE figures labeling the line either in the top or bottom margin, or on the line itself:	30	
Estimate tenths from grid line to point:	2	
2. Locate first HORIZONTAL grid line BELOW point and read LARGE figures labeling the line either in the left or right margin, or on the line itself:		33
Estimate tenths from grid line to point:		8
REFERENCE:	302338	
If reporting beyond 100,000 meters or if sheet overlapping grid prefix 100,000 Meter Square Identification, as:	GN302338	
If reporting beyond 18° in any direction, prefix Grid Zone Designation as:	16SGN302338	

1930

FORT McPHERSON & VICINITY, GEORGIA

N3339-W8425/6x10

DATA BASE:

AQUIFER HORIZ. HYDR. COND. (GPD/SQ FT)= 240.00
AQUIFER VERT. HYDR. COND. (GPD/SQ FT)= 80.000
AQUIFER THICKNESS (FT)= 16.00
ARTESIAN AQUIFER STORATIVITY (DIM)= 3.0000D-03
WATER TABLE STORATIVITY (DIM)= 0.0030
PRODUCT. WELL EFFECTIVE RADIUS (FT)= 0.170
TOP OF AQUIFER DEPTH (FT)= 12.00
BASE OF AQUIFER DEPTH (FT)= 28.00
INITIAL WATER LEVEL DEPTH (FT)= 12.00
INFINITE AQUIFER SYSTEM

COMPUTATION RESULTS:

PRODUCTION WELL DISCHARGE RATE (GPM)= 15.00

TIME-DRAWDOWN OR WATER LEVEL VALUES (FT)

	SELECTED DISTANCES (FT)					
TIME(MIN)	0.17	26.94	67.68	170.00	427.02	1072.63
0.15	13.89	12.00	12.00	12.00	12.00	12.00
0.24	14.46	12.00	12.00	12.00	12.00	12.00
0.38	15.05	12.00	12.00	12.00	12.00	12.00
0.61	15.63	12.01	12.00	12.00	12.00	12.00
0.96	16.15	12.03	12.00	12.00	12.00	12.00
1.53	16.59	12.06	12.00	12.00	12.00	12.00
2.42	16.97	12.12	12.00	12.00	12.00	12.00
3.84	17.31	12.21	12.01	12.00	12.00	12.00
6.08	17.61	12.31	12.02	12.00	12.00	12.00
9.64	17.91	12.44	12.04	12.00	12.00	12.00
15.27	18.20	12.58	12.08	12.00	12.00	12.00
24.20	18.51	12.74	12.15	12.00	12.00	12.00
38.36	18.84	12.92	12.25	12.01	12.00	12.00
60.80	19.19	13.11	12.38	12.03	12.00	12.00
96.36	19.56	13.31	12.53	12.07	12.00	12.00
152.72	19.95	13.52	12.70	12.13	12.00	12.00
242.04	20.36	13.75	12.89	12.23	12.01	12.00
383.61	20.80	13.97	13.09	12.36	12.03	12.00
607.98	21.27	14.21	13.30	12.52	12.06	12.00
963.59	21.78	14.45	13.52	12.69	12.13	12.00
1320.00	22.16	14.62	13.68	12.83	12.20	12.01

TIME AFTER PUMPING STARTED(MIN)= 1320.00

DISTANCE-DRAWDOWN OR WATER LEVEL VALUES AT END OF PUMPING PERIOD

NODE NO	RADIUS(FT)	DRAWDOWN OR WATER LEVEL (FT)
2	0.17	22.16
3	0.27	21.13
4	0.43	20.23
5	0.68	19.42
6	1.07	18.69
7	1.70	18.00
8	2.69	17.36
9	4.27	16.76
10	6.77	16.19
11	10.73	15.64
12	17.00	15.12
13	26.94	14.62
14	42.70	14.14
15	67.68	13.68
16	107.26	13.24
17	170.00	12.83
18	269.43	12.47
19	427.02	12.20
20	676.78	12.05
21	1072.63	12.01

DATA BASE:

AQUIFER HORIZ. HYDR. COND. (GPD/SQ FT)= 240.00
AQUIFER VERT. HYDR. COND. (GPD/SQ FT)= 80.000
AQUIFER THICKNESS (FT)= 16.00
ARTESIAN AQUIFER STORATIVITY (DIM)= 3.0000D-02
WATER TABLE STORATIVITY (DIM)= 0.0300
PRODUCT. WELL EFFECTIVE RADIUS (FT)= 0.170
TOP OF AQUIFER DEPTH (FT)= 12.00
BASE OF AQUIFER DEPTH (FT)= 28.00
INITIAL WATER LEVEL DEPTH (FT)= 12.00
INFINITE AQUIFER SYSTEM

COMPUTATION RESULTS:

PRODUCTION WELL DISCHARGE RATE (GPM)= 15.00

TIME-DRAWDOWN OR WATER LEVEL VALUES (FT)

	SELECTED DISTANCES (FT)					
TIME(MIN)	0.17	26.94	67.68	170.00	427.02	1072.63
0.15	13.51	12.00	12.00	12.00	12.00	12.00
0.24	13.90	12.00	12.00	12.00	12.00	12.00
0.38	14.31	12.00	12.00	12.00	12.00	12.00
0.61	14.70	12.00	12.00	12.00	12.00	12.00
0.96	15.06	12.00	12.00	12.00	12.00	12.00
1.53	15.41	12.00	12.00	12.00	12.00	12.00
2.42	15.73	12.00	12.00	12.00	12.00	12.00
3.84	16.03	12.00	12.00	12.00	12.00	12.00
6.08	16.32	12.01	12.00	12.00	12.00	12.00
9.64	16.61	12.03	12.00	12.00	12.00	12.00
15.27	16.89	12.07	12.00	12.00	12.00	12.00
24.20	17.16	12.14	12.00	12.00	12.00	12.00
38.36	17.43	12.22	12.01	12.00	12.00	12.00
60.80	17.70	12.33	12.02	12.00	12.00	12.00
96.36	17.96	12.45	12.04	12.00	12.00	12.00
152.72	18.24	12.59	12.09	12.00	12.00	12.00
242.04	18.54	12.75	12.15	12.00	12.00	12.00
383.61	18.86	12.92	12.25	12.01	12.00	12.00
607.98	19.20	13.11	12.38	12.03	12.00	12.00
963.59	19.57	13.31	12.53	12.07	12.00	12.00
1320.00	19.84	13.46	12.65	12.11	12.00	12.00

TIME AFTER PUMPING STARTED(MIN)= 1320.00

DISTANCE-DRAWDOWN OR WATER LEVEL VALUES AT END OF PUMPING PERIOD

NODE NO	RADIUS(FT)	DRAWDOWN OR WATER LEVEL (FT)
2	0.17	19.84
3	0.27	19.07
4	0.43	18.36
5	0.68	17.70
6	1.07	17.07
7	1.70	16.49
8	2.69	15.93
9	4.27	15.39
10	6.77	14.88
11	10.73	14.39
12	17.00	13.92
13	26.94	13.46
14	42.70	13.04
15	67.68	12.68
16	107.26	12.33
17	170.00	12.11
18	269.43	12.02
19	427.02	12.00

DATA BASE:

AQUIFER HORIZ. HYDR. COND. (GPD/SQ FT)= 240.00
AQUIFER VERT. HYDR. COND. (GPD/SQ FT)= 80.000
AQUIFER THICKNESS (FT)= 16.00
ARTESIAN AQUIFER STORATIVITY (DIM)= 3.0000D-04
WATER TABLE STORATIVITY (DIM)= 0.0003
PRODUCT. WELL EFFECTIVE RADIUS (FT)= 0.170
TOP OF AQUIFER DEPTH (FT)= 12.00
BASE OF AQUIFER DEPTH (FT)= 28.00
INITIAL WATER LEVEL DEPTH (FT)= 12.00
INFINITE AQUIFER SYSTEM

COMPUTATION RESULTS:

PRODUCTION WELL DISCHARGE RATE (GPM)= 15.00

TIME-DRAWDOWN OR WATER LEVEL VALUES (FT)

	SELECTED DISTANCES (FT)					
TIME(MIN)	0.17	26.94	67.68	170.00	427.02	1072.63
0.13	14.15	12.02	12.00	12.00	12.00	12.00
0.24	14.87	12.06	12.00	12.00	12.00	12.00
0.38	15.64	12.12	12.00	12.00	12.00	12.00
0.61	16.41	12.21	12.01	12.00	12.00	12.00
0.96	17.10	12.33	12.03	12.00	12.00	12.00
1.53	17.69	12.48	12.08	12.00	12.00	12.00
2.42	18.19	12.66	12.13	12.00	12.00	12.00
3.84	18.63	12.86	12.22	12.01	12.00	12.00
6.08	19.05	13.07	12.35	12.03	12.00	12.00
9.64	19.46	13.28	12.51	12.06	12.00	12.00
15.27	19.88	13.50	12.69	12.13	12.00	12.00
24.20	20.31	13.73	12.88	12.23	12.01	12.00
38.36	20.77	13.96	13.08	12.36	12.03	12.00
60.80	21.25	14.20	13.29	12.51	12.06	12.00
96.36	21.76	14.44	13.51	12.69	12.13	12.00
152.72	22.31	14.69	13.74	12.88	12.23	12.01
242.04	22.93	14.94	13.97	13.08	12.36	12.03
383.61	23.62	15.19	14.20	13.30	12.52	12.06
607.98	24.43	15.45	14.44	13.51	12.69	12.13
963.59	25.47	15.72	14.69	13.74	12.88	12.23

EXCESSIVE DRAWDOWN

TIME AFTER PUMPING STARTED(MIN)= 1330.00

DISTANCE-DRAWDOWN OR WATER LEVEL VALUES AT END OF PUMPING PERIOD

NODE NO	RADIUS(FT)	DRAWDOWN OR WATER LEVEL (FT)
2	0.17	25.47
3	0.27	23.62
4	0.43	22.32
5	0.68	21.26
6	1.07	20.35
7	1.70	19.53
8	2.69	18.79
9	4.27	18.10
10	6.77	17.45
11	10.73	16.84
12	17.00	16.27
13	26.94	15.72
14	42.70	15.19
15	67.68	14.69
16	107.26	14.20
17	170.00	13.74
18	269.43	13.30
19	427.02	12.88
20	676.78	12.52
21	1072.63	12.23
22	1700.00	12.06
23	2694.32	12.01

DATA BASE:

AQUIFER HORIZ. HYDR. COND. (GPD/SQ FT)= 240.00
AQUIFER VERT. HYDR. COND. (GPD/SQ FT)= 80.000
AQUIFER THICKNESS (FT)= 16.00
ARTESIAN AQUIFER STORATIVITY (DIM)= 3.0000D-03
WATER TABLE STORATIVITY (DIM)= 0.0020
PRODUCT. WELL EFFECTIVE RADIUS (FT)= 0.170
TOP OF AQUIFER DEPTH (FT)= 12.00
BASE OF AQUIFER DEPTH (FT)= 28.00
INITIAL WATER LEVEL DEPTH (FT)= 12.00
INFINITE AQUIFER SYSTEM

COMPUTATION RESULTS:

PRODUCTION WELL DISCHARGE RATE (GPM)= 15.00

TIME-DRAWDOWN OR WATER LEVEL VALUES (FT)

	SELECTED DISTANCES (FT)					
TIME(MIN)	0.17	26.94	67.68	170.00	427.02	1072.63
0.15	13.89	12.00	12.00	12.00	12.00	12.00
0.24	14.46	12.00	12.00	12.00	12.00	12.00
0.38	15.05	12.00	12.00	12.00	12.00	12.00
0.61	15.63	12.01	12.00	12.00	12.00	12.00
0.96	16.15	12.03	12.00	12.00	12.00	12.00
1.53	16.59	12.06	12.00	12.00	12.00	12.00
2.42	16.97	12.12	12.00	12.00	12.00	12.00
3.84	17.31	12.21	12.01	12.00	12.00	12.00
6.08	17.61	12.31	12.02	12.00	12.00	12.00
9.64	17.91	12.44	12.04	12.00	12.00	12.00
15.27	18.20	12.58	12.08	12.00	12.00	12.00
24.20	18.51	12.74	12.15	12.00	12.00	12.00
38.36	18.84	12.92	12.25	12.01	12.00	12.00
60.80	19.19	13.11	12.38	12.03	12.00	12.00
96.36	19.56	13.31	12.53	12.07	12.00	12.00
152.72	19.93	13.52	12.70	12.13	12.00	12.00
242.04	20.36	13.75	12.89	12.23	12.01	12.00
383.61	20.80	13.97	13.09	12.36	12.03	12.00
607.98	21.27	14.21	13.30	12.52	12.06	12.00
963.59	21.78	14.45	13.52	12.69	12.13	12.00
1320.00	22.16	14.62	13.68	12.83	12.20	12.01

TIME AFTER PUMPING STARTED(MIN)= 1320.00

DISTANCE-DRAWDOWN OR WATER LEVEL VALUES AT END OF PUMPING PERIOD

NODE NO	RADIUS(FT)	DRAWDOWN OR WATER LEVEL (FT)
2	0.17	22.16
3	0.27	21.13
4	0.43	20.23
5	0.68	19.42
6	1.07	18.69
7	1.70	18.00
8	2.69	17.36
9	4.27	16.76
10	6.77	16.19
11	10.73	15.64
12	17.00	15.12
13	26.94	14.62
14	42.70	14.14
15	67.68	13.68
16	107.26	13.24
17	170.00	12.83
18	269.43	12.47
19	427.02	12.20
20	676.78	12.05
21	1072.63	12.01

MONITORING WELL ELEVATIONS

	8-18-89	11-13-89	(recheck) 1-31-90
MW1	27' 1"	27' 4"	~~27'~~ (26' 10 1/2")
MW2	21' 7"	21' 1 7/8"	18' 8" (18'8")
MW3	16' 7 1/4"	16' 8 1/2"	16' 1 1/2"
MW4	14' 11 1/2"	14' 11"	11' 1 3/4" (11-1 3/4")
MW5	19' 5"	19' 4 3/4"	19' 1"
MW6	20' —	20' —	19' 6 1/4"
MW7	17' 10"	17' 11 1/2"	17' 3"
MW7A	20' 1"	20' 2 3/8"	19' 4 1/4"
MW7B	21' 5"	21' 6"	20' —
MW8	20' 10 1/4"	21' 1/4"	20' 9 1/4"
MW9	20' 8 1/4"	20' 8 3/8"	19' 7"
MW10	23' 1"	23' 2 7/8"	22' 11 1/4"
MW11	19' 1 1/4"	19' 4 1/8"	18' 8 3/4"
		1 PM TO 3 PM	10 AM 12 NOON

1 new elevation
1 Boot lower cap

vent holes
1
10
11
7B

PW1

2 Feb
18.36
11.50

DATA BASE:

AQUIFER HORIZ. HYDR. COND. (GPD/SQ FT)= 218.00
AQUIFER VERT. HYDR. COND. (GPD/SQ FT)= 40.000
AQUIFER THICKNESS (FT)= 17.85
ARTESIAN AQUIFER STORATIVITY (DIM)= 3.0000D-03
WATER TABLE STORATIVITY (DIM)= 0.0030
PRODUCT. WELL EFFECTIVE RADIUS (FT)= 0.170
TOP OF AQUIFER DEPTH (FT)= 9.75
BASE OF AQUIFER DEPTH (FT)= 27.60
INITIAL WATER LEVEL DEPTH (FT)= 9.75
INFINITE AQUIFER SYSTEM

COMPUTATION RESULTS:

PRODUCTION WELL DISCHARGE RATE (GPM)= 15.00

TIME-DRAWDOWN OR WATER LEVEL VALUES (FT)

	SELECTED DISTANCES (FT)					
TIME(MIN)	0.17	26.94	67.68	170.00	427.02	1072.63
0.15	11.74	9.75	9.75	9.75	9.75	9.75
0.24	12.33	9.75	9.75	9.75	9.75	9.75
0.38	12.96	9.75	9.75	9.75	9.75	9.75
0.60	13.56	9.75	9.75	9.75	9.75	9.75
0.95	14.10	9.78	9.75	9.75	9.75	9.75
1.51	14.57	9.92	9.75	9.75	9.75	9.75
2.39	14.98	9.90	9.75	9.75	9.75	9.75
3.79	15.34	10.00	9.76	9.75	9.75	9.75
6.00	15.67	10.12	9.78	9.75	9.75	9.75
9.51	15.98	10.26	9.81	9.75	9.75	9.75
15.07	16.26	10.42	9.86	9.75	9.75	9.75
23.89	16.58	10.59	9.94	9.75	9.75	9.75
37.84	16.88	10.74	10.04	9.76	9.75	9.75
60.00	17.21	10.95	10.17	9.78	9.75	9.75
95.09	17.55	11.15	10.32	9.83	9.75	9.75
150.71	17.93	11.37	10.50	9.90	9.75	9.75
238.85	18.32	11.59	10.69	10.00	9.76	9.75
378.55	18.73	11.83	10.90	10.14	9.78	9.75
599.97	19.17	12.07	11.12	10.30	9.82	9.75
950.89	19.64	12.32	11.36	10.48	9.89	9.75
1506.00	20.30	12.50	11.51	10.62	9.96	9.76

TIME AFTER PUMPING STARTED(MIN)= 1506.00

DISTANCE-DRAWDOWN OR WATER LEVEL VALUES AT END OF PUMPING PERIOD

NODE NO	RADIUS(FT)	DRAWDOWN OR WATER LEVEL (FT)
2	0.17	20.00
3	0.27	19.14
4	0.42	18.19
5	0.69	17.35
6	1.07	16.66
7	1.70	15.97
8	2.69	15.32
9	4.27	14.71
10	6.77	14.12
11	10.73	13.56
12	17.00	13.02
13	26.94	12.50
14	42.70	11.99
15	67.69	11.51
16	107.25	11.05
17	170.00	10.62
18	269.43	10.24
19	427.02	9.96
20	676.78	9.80
21	1072.63	9.76

DATA BASE:

AQUIFER HORIZ. HYDR. COND. (GPD/SQ FT)= 240.00
AQUIFER VERT. HYDR. COND. (GPD/SQ FT)= 80.000
AQUIFER THICKNESS (FT)= 16.00
ARTESIAN AQUIFER STORATIVITY (DIM)= 3.0000D-03
WATER TABLE STORATIVITY (DIM)= 0.0030
PRODUCT. WELL EFFECTIVE RADIUS (FT)= 0.170
TOP OF AQUIFER DEPTH (FT)= 12.00
BASE OF AQUIFER DEPTH (FT)= 28.00
INITIAL WATER LEVEL DEPTH (FT)= 12.00
INFINITE AQUIFER SYSTEM

COMPUTATION RESULTS:

PRODUCTION WELL DISCHARGE RATE (GPM)= 15.00

TIME-DRAWDOWN OR WATER LEVEL VALUES (FT)

	SELECTED DISTANCES (FT)					
TIME(MIN)	0.17	26.94	67.68	170.00	427.02	1072.63
0.15	13.89	12.00	12.00	12.00	12.00	12.00
0.24	14.46	12.00	12.00	12.00	12.00	12.00
0.38	15.05	12.00	12.00	12.00	12.00	12.00
0.61	15.63	12.01	12.00	12.00	12.00	12.00
0.96	16.15	12.03	12.00	12.00	12.00	12.00
1.53	16.59	12.06	12.00	12.00	12.00	12.00
2.42	16.97	12.12	12.00	12.00	12.00	12.00
3.84	17.31	12.21	12.01	12.00	12.00	12.00
6.08	17.61	12.31	12.02	12.00	12.00	12.00
9.64	17.91	12.44	12.04	12.00	12.00	12.00
15.27	18.20	12.58	12.08	12.00	12.00	12.00
24.20	18.51	12.74	12.15	12.00	12.00	12.00
38.36	18.84	12.92	12.25	12.01	12.00	12.00
60.80	19.19	13.11	12.38	12.03	12.00	12.00
96.36	19.56	13.31	12.53	12.07	12.00	12.00
152.72	19.95	13.52	12.70	12.13	12.00	12.00
242.04	20.36	13.75	12.89	12.23	12.01	12.00
383.61	20.80	13.97	13.09	12.36	12.03	12.00
607.98	21.27	14.21	13.30	12.52	12.06	12.00
963.59	21.78	14.45	13.52	12.69	12.13	12.00
1320.00	22.16	14.62	13.68	12.83	12.20	12.01

TIME AFTER PUMPING STARTED(MIN)= 1320.00

DISTANCE-DRAWDOWN OR WATER LEVEL VALUES AT END OF PUMPING PERIOD

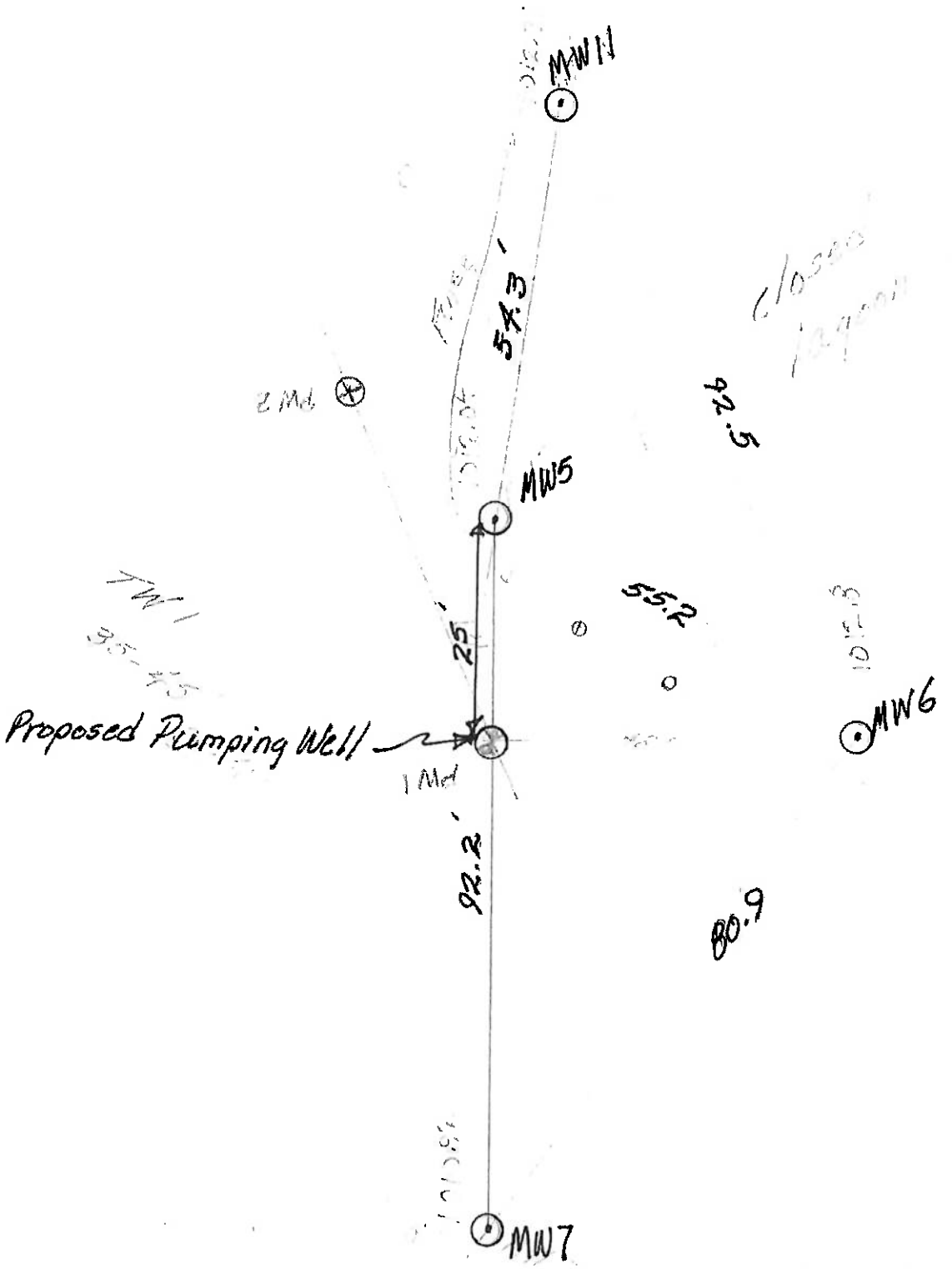
NODE NO	RADIUS(FT)	DRAWDOWN OR WATER LEVEL (FT)
2	0.17	22.16
3	0.27	21.13
4	0.43	20.23
5	0.68	19.42
6	1.07	18.69
7	1.70	18.00
8	2.69	17.36
9	4.27	16.76
10	6.77	16.19
11	10.73	15.64
12	17.00	15.12
13	26.94	14.62
14	42.70	14.14
15	67.68	13.68
16	107.26	13.24
17	170.00	12.83
18	269.43	12.47
19	427.02	12.20
20	676.78	12.05
21	1072.63	12.01

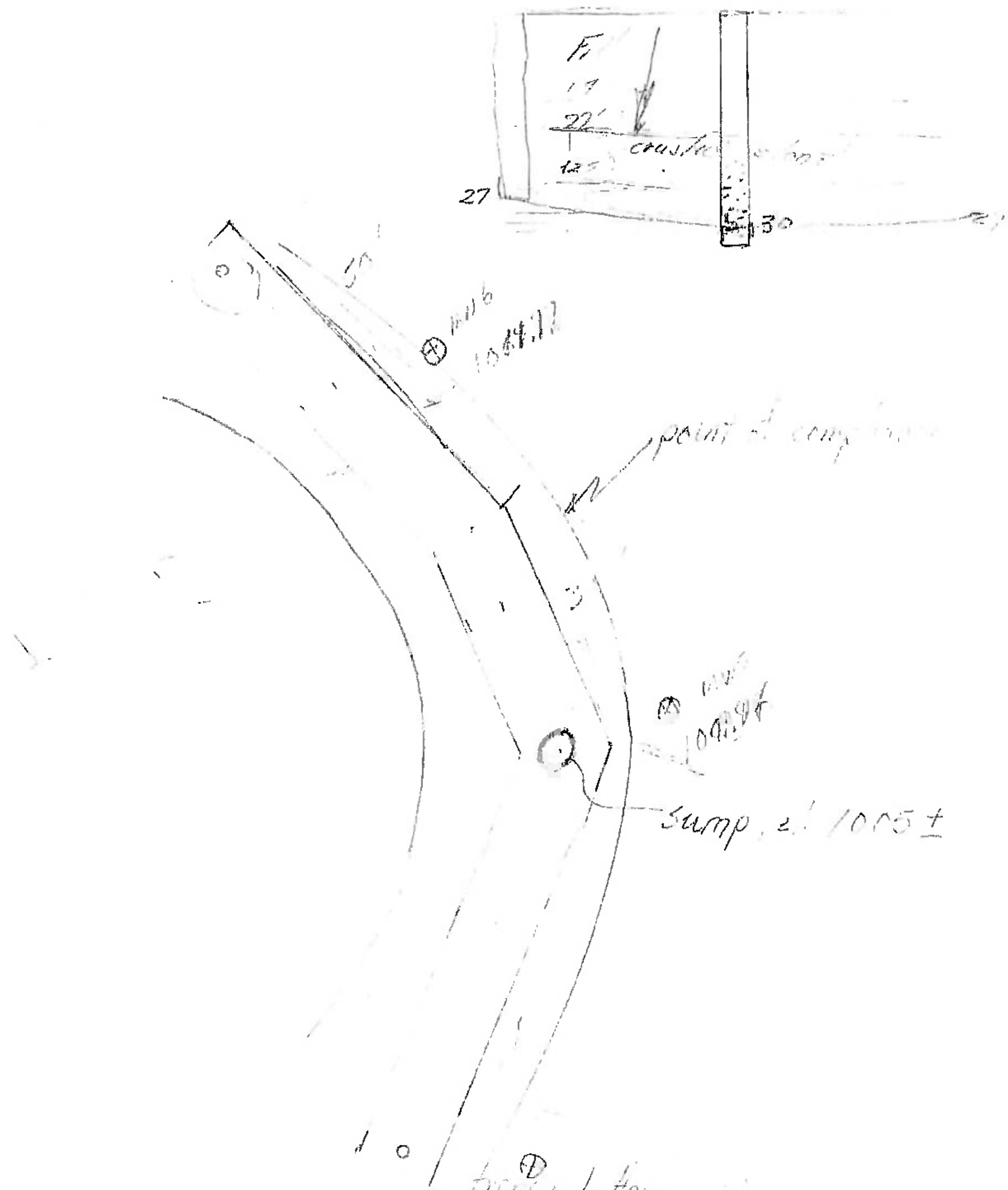
DATA BASE:

AQUIFER HORIZ. HYDR. CONDUCTIVITY GPD/SQ FT)= 2.4000E+02
AQUIFER VERT. HYDR. CONDUCTIVITY (GPD/SQ FT)= 8.0000E+01
RADIAL DISTANCE TO WELL (FT)= 5.0000E+01
AQUIFER THICKNESS (FT)= 1.6000E+01
DIST. FROM AQUIFER TOP TO BOTTOM OF PROD. WELL (FT)= 1.5000E+01
DIST. FROM AQUIFER TOP TO PROD. WELL SCREEN TOP (FT) 0.0000E+00
DIST. FROM AQUIFER TOP TO BOTTOM OF OBS. WELL (FT)= 1.5000E+01
DIST. FROM AQUIFER TOP TO TOP OF OBS. WELL SCREEN(FT)= 0.0000E+00
U= 0.0000E+00

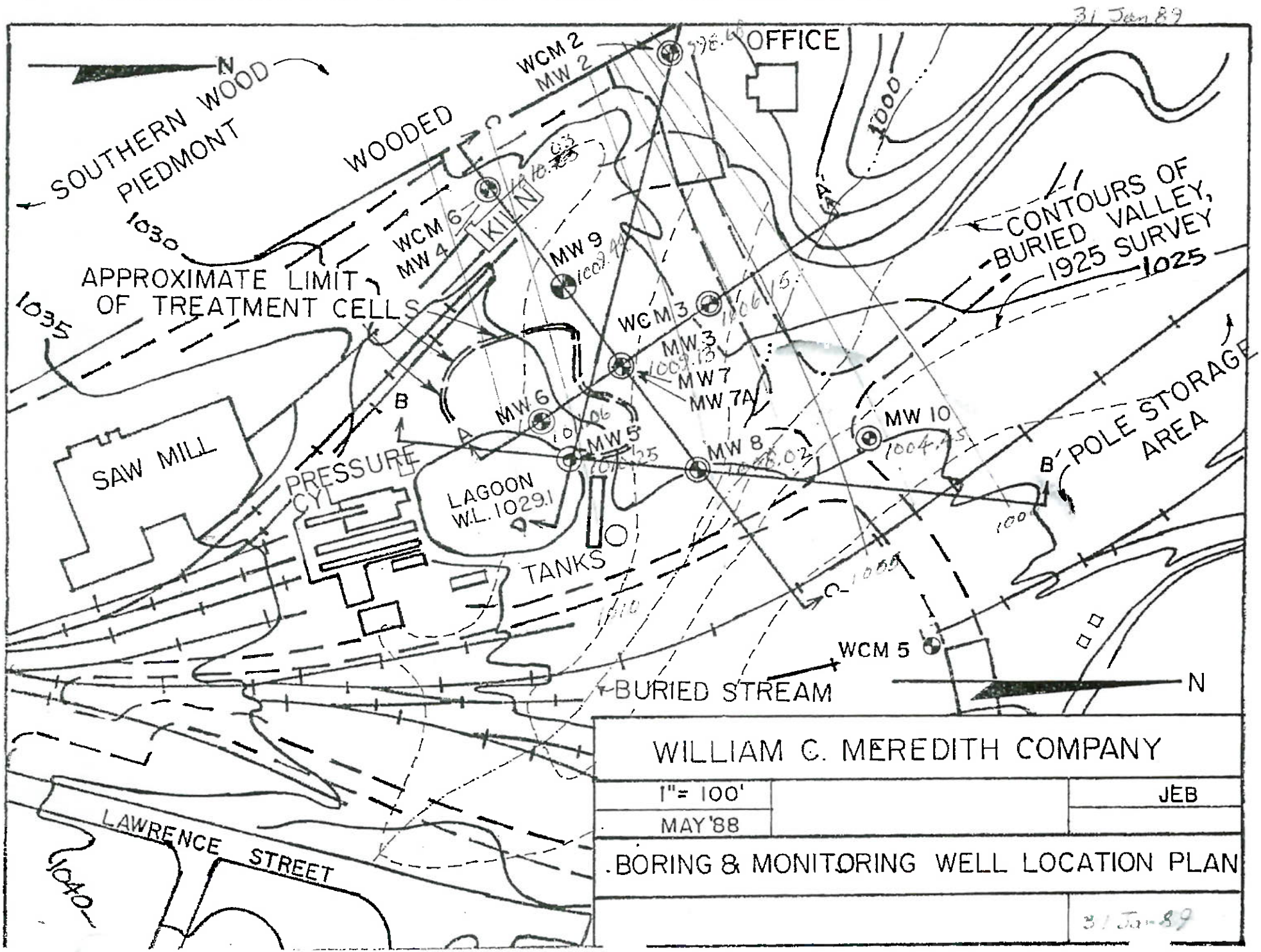
COMPUTATION RESULTS:

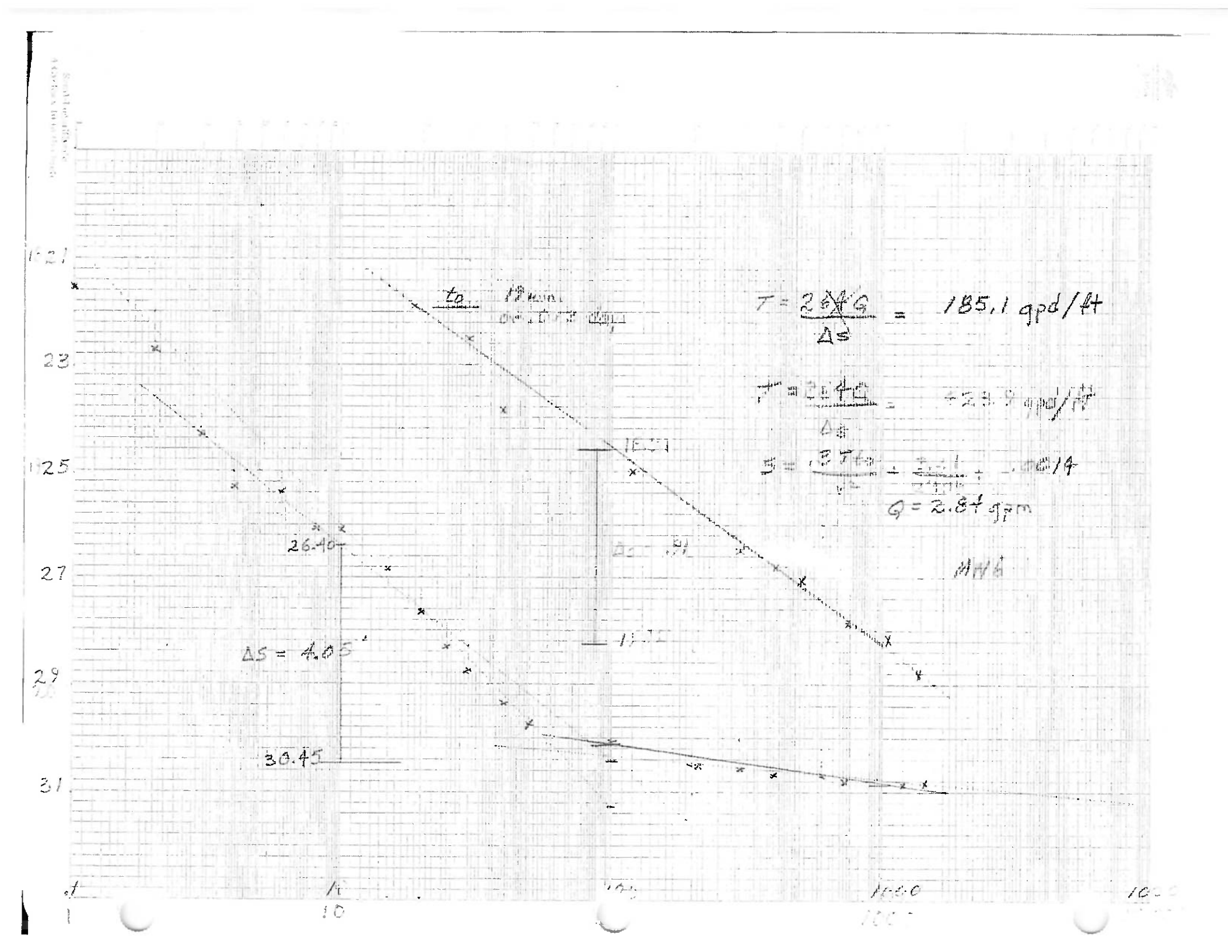
WELL FUNCTION= 4.0694E-04


MW1
54.3'
MW5
25'
55.2
MW6
Proposed Pumping Well
92.2'
80.9
MW7
W. C. Meredith Co



W. C. Moore & Co
Infiltration Trench


31 Jan 89
N
SOUTHERN WOOD PIEDMONT
WOODED
WCM 2
MW 2
OFFICE
1000
1030
WCM 6
MW 4
KILN
MW 9
CONTOURS OF BURIED VALLEY, 1925 SURVEY
1025
APPROXIMATE LIMIT OF TREATMENT CELLS
1035
WCM 3
MW 3
MW 7
MW 7A
B
A
MW 6
MW 5
MW 8
MW 10
POLE STORAGE AREA
SAW MILL
PRESSURE CYL
LAGOON W.L. 1029.1
TANKS
WCM 5
BURIED STREAM
N
LAWRENCE STREET
1040
WILLIAM C. MEREDITH COMPANY
1"= 100'
JEB
MAY '88
BORING & MONITORING WELL LOCATION PLAN
31 Jan 89


$T = \frac{264G}{\Delta s} = 185.1$ gpd/ft
26.40
$\Delta s = 4.05'$
30.45

GRUNDFOS

4

.055 24 cm 24 00
-1059.5 10 59.5
2255 1345.5 mm 13½ 5.5
785.5 min ½ cm
0 5 1059.5 664.5
2450.0 11 4.5 785.5
1109.5 km 66 4.5 1450.0 mm 2.84 cm

SWL 17.27

Drawdown at conclusion of test

MW7 0835 hr. 5 May 19.29
1036 hr 6 May 17.07
1.08

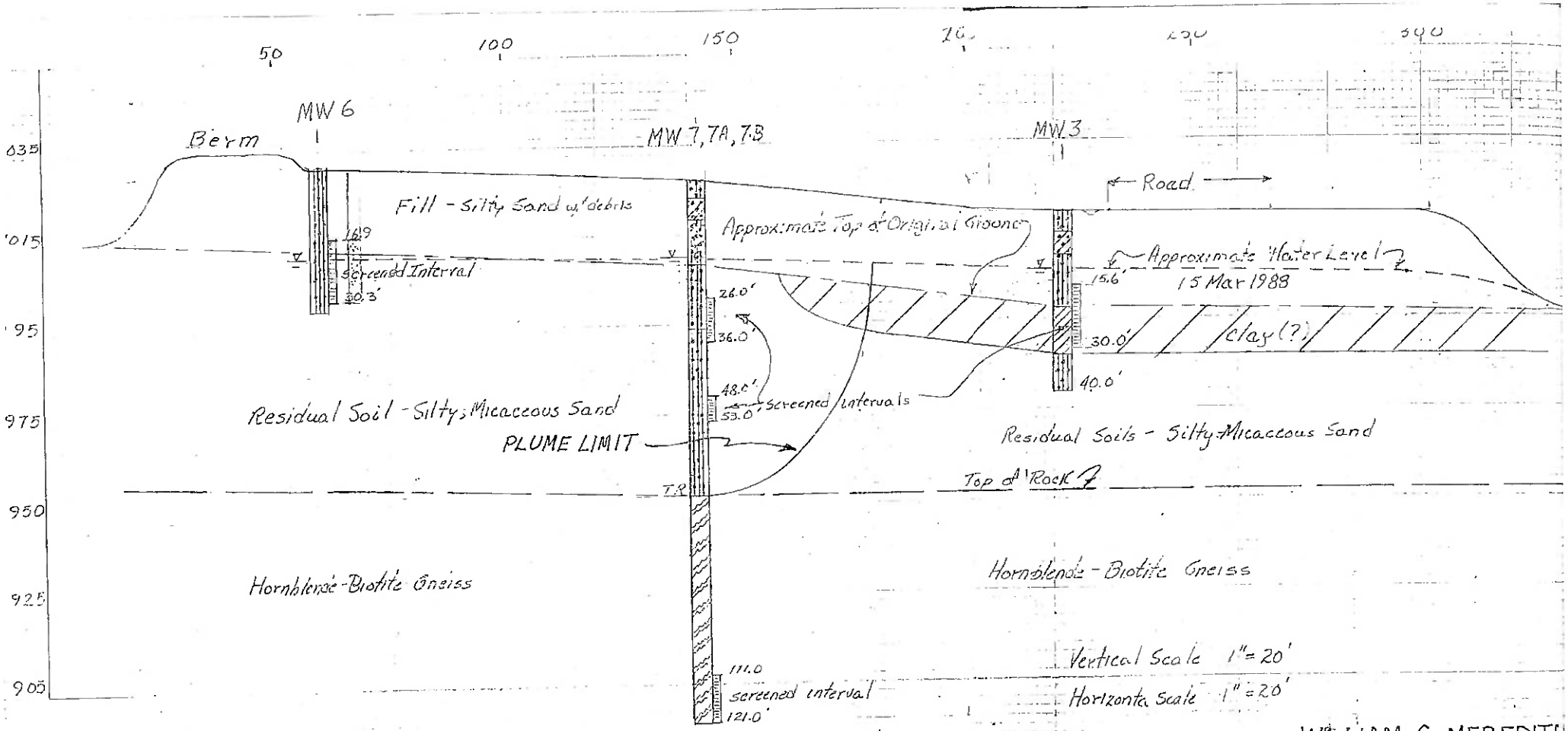
MW3 0944 5 May 18.46
1033 6 May 18.77
.31

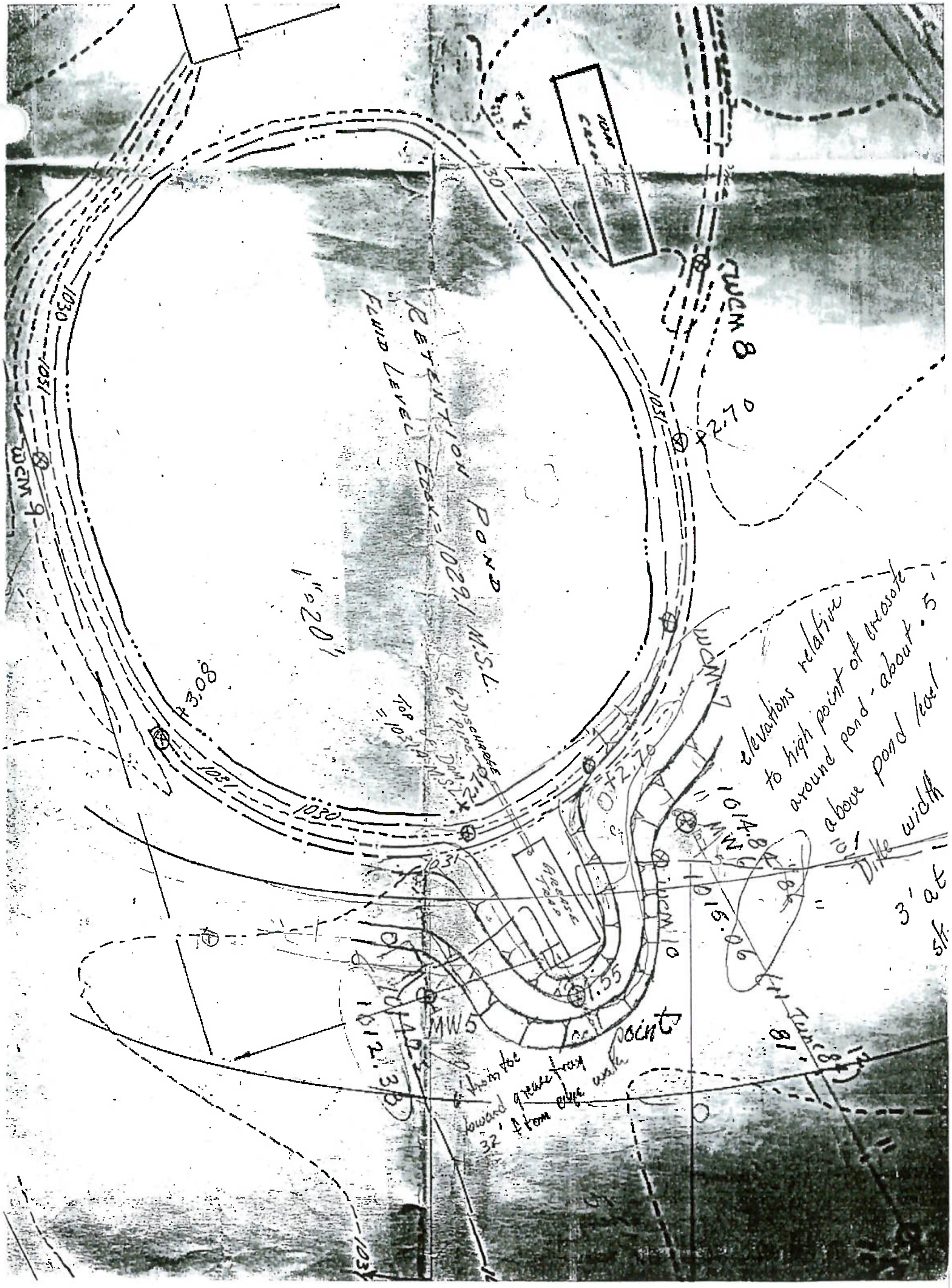
MW7H 837 5 May 18.19
1031 6 May 19.37
1.18

MW6 08 18.24
1035 19.06
1.72

MW5 18.40
22.04
3.64

MW11


50
100
150
MW 6
MW 7, 7A, 7B
MW 3
Berm
635
615
595
975
950
925
905
Fill - Silty Sand w/ debris
Approximate Top of Original Grade
Road
Approximate Water Level
15 Mar 1988
16.9
Screened Interval
30.3'
26.0'
36.0'
48.0'
53.0'
screened intervals
15.6'
30.0'
40.0'
Clay (?)
Residual Soil - Silty, Micaceous Sand
PLUME LIMIT
TR
Top of Rock
Residual Soils - Silty, Micaceous Sand
Hornblende-Biotite Gneiss
Hornblende - Biotite Gneiss
111.0
screened interval
121.0'
Vertical Scale 1" = 20'
Horizontal Scale 1" = 20'
Geologic Cross Section - A - A'
21 MAY 1988
WILLIAM C MEREDITH


RETENTION POND
FLUID LEVEL ELEV=1029.1 M.S.L.
1"=20'
6" DISCHARGE PIPE
TOP OF DAM 1031.4 M.S.L.
GREASE TRAP
WCM 7
WCM 8
WCM 9
WCM 10
MW 5
MW 6
+3.08
+2.70
1.55
1030
1031
1014.8
1015.06
1012.38
elevations relative
to high point of creosote
around pond - about .5
above pond level
Dike width
3' at
point
toward grease trap
32' from edge walk