MONITORING WELL CONSTRUCTION LOG

MONITORING WELL: MW-2 JOB NO.: 49498-001 DATE: 7-24-01

PROJECT: Chesapeake Golf Course

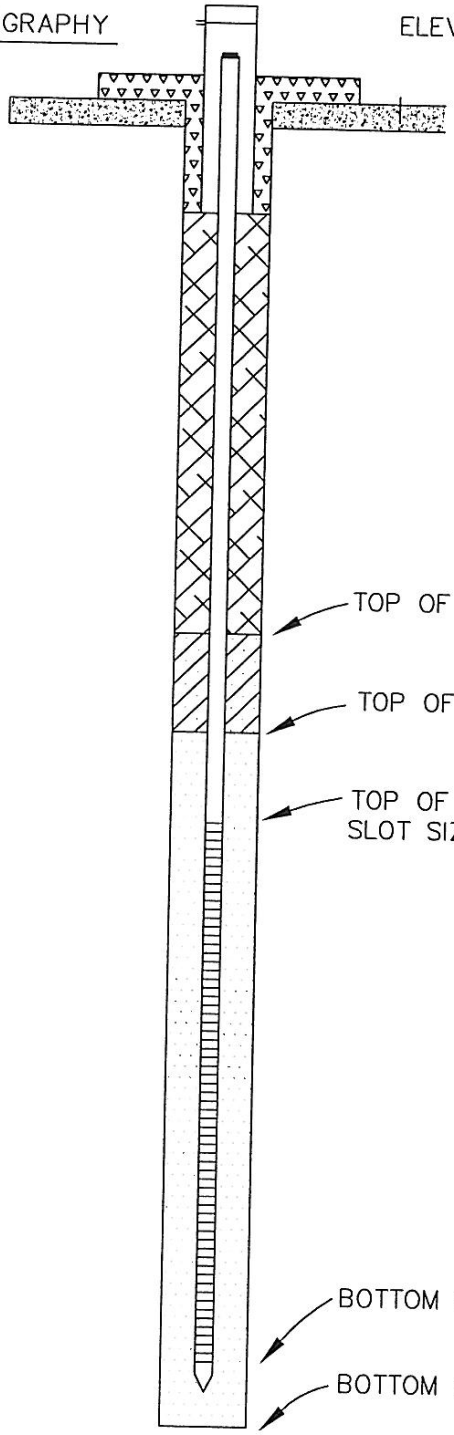
SITE LOCATION: Chesapeake, Virginia GEOLOGIST: M.R.

DRILLING CONTRACTOR: Fishburne Drilling Inc.

URS

GENERALIZED STRATIGRAPHY

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25



ELEVATIONS: GROUND SURFACE: 9.86
TOP OF CASING: 13.11

TOP OF BENTONITE SEAL: DEPTH (FEET) 11

TOP OF SAND PACK: DEPTH (FEET) 13

TOP OF SCREEN: DEPTH (FEET) 15
SLOT SIZE: 0.01

BOTTOM OF SCREEN: DEPTH (FEET) 25

BOTTOM OF BORING: DEPTH (FEET) 25

MONITORING WELL CONSTRUCTION LOG

MONITORING WELL: MW-3 JOB NO.: 49498-001 DATE: 7-25-01

PROJECT: Chesapeake Golf Course

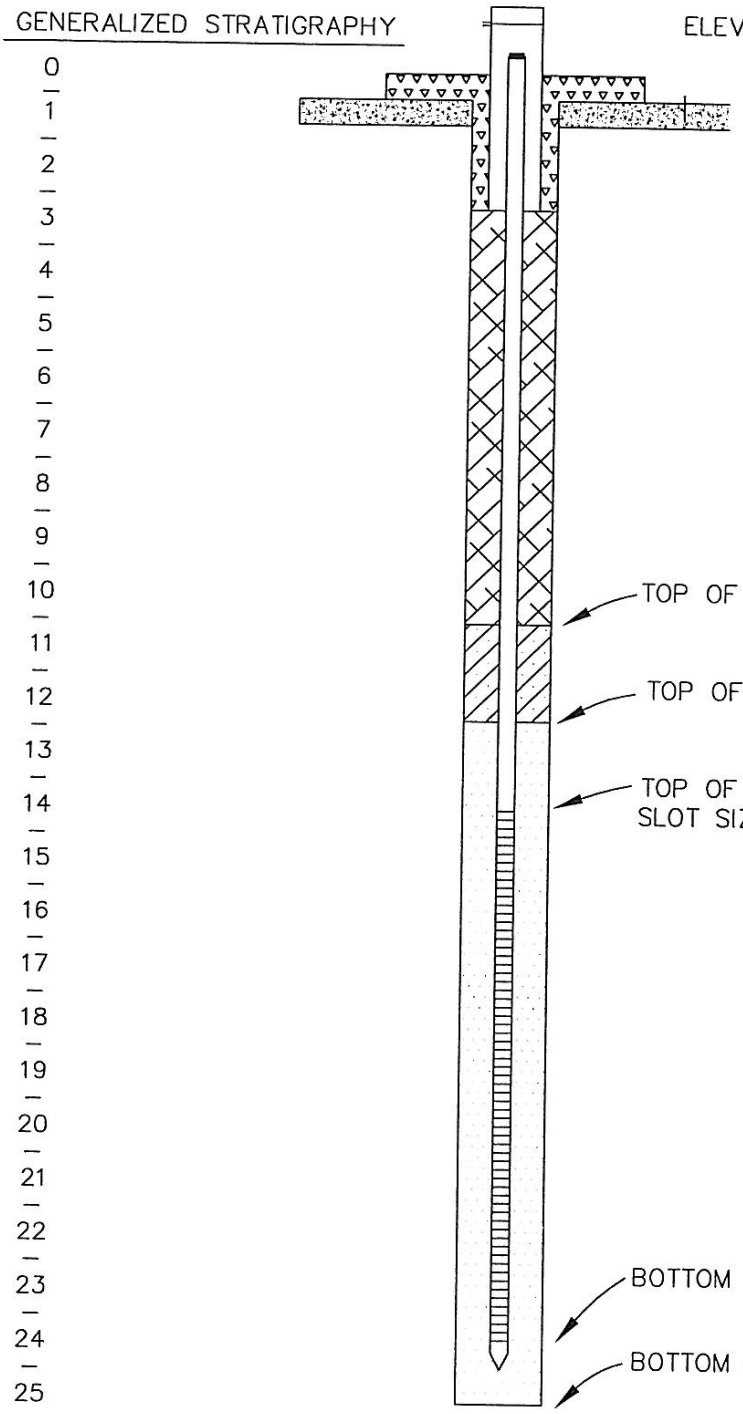
SITE LOCATION: Chesapeake, Virginia GEOLOGIST: M.R./B.F.

DRILLING CONTRACTOR: Fishburne Drilling Inc.

URS

GENERALIZED STRATIGRAPHY

ELEVATIONS: GROUND SURFACE: 9.71
TOP OF CASING: 12.75



TOP OF BENTONITE SEAL: DEPTH (FEET) 11

TOP OF SAND PACK: DEPTH (FEET) 13

TOP OF SCREEN: DEPTH (FEET) 15
SLOT SIZE: 0.01

BOTTOM OF SCREEN: DEPTH (FEET) 25

BOTTOM OF BORING: DEPTH (FEET) 25

MONITORING WELL CONSTRUCTION LOG

MONITORING WELL: MW-4 JOB NO.: 49498-001 DATE: 7-25-01

PROJECT: Chesapeake Golf Course

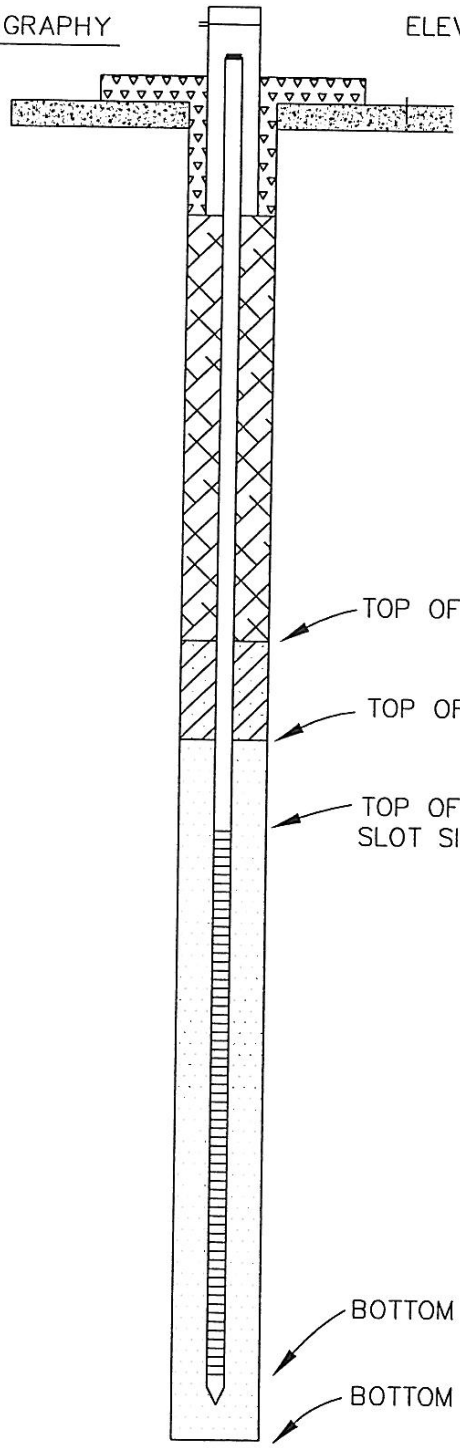
SITE LOCATION: Chesapeake, Virginia GEOLOGIST: M.R.

DRILLING CONTRACTOR: Fishburne Drilling Inc.

URS

GENERALIZED STRATIGRAPHY

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25



ELEVATIONS: GROUND SURFACE: 11.13

TOP OF CASING: 14.10

TOP OF BENTONITE SEAL: DEPTH (FEET) 11

TOP OF SAND PACK: DEPTH (FEET) 13

TOP OF SCREEN: DEPTH (FEET) 15

SLOT SIZE: 0.01

BOTTOM OF SCREEN: DEPTH (FEET) 25

BOTTOM OF BORING: DEPTH (FEET) 25

MONITORING WELL CONSTRUCTION LOG

MONITORING WELL: MW-5 JOB NO.: 49498-001 DATE: 7-25-01

PROJECT: Chesapeake Golf Course

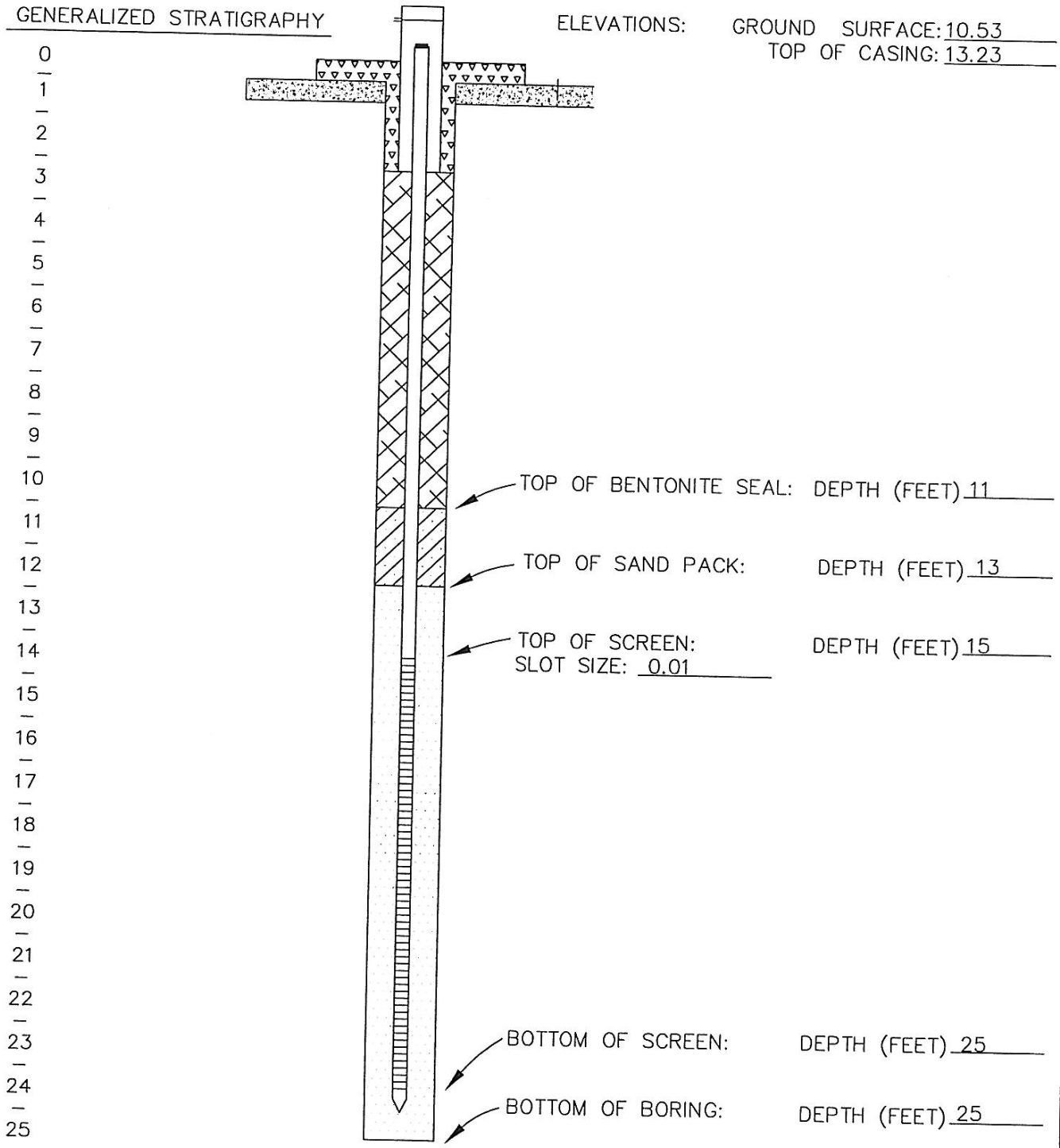
SITE LOCATION: Chesapeake, Virginia GEOLOGIST: M.R.

DRILLING CONTRACTOR: Fishburne Drilling Inc.

URS

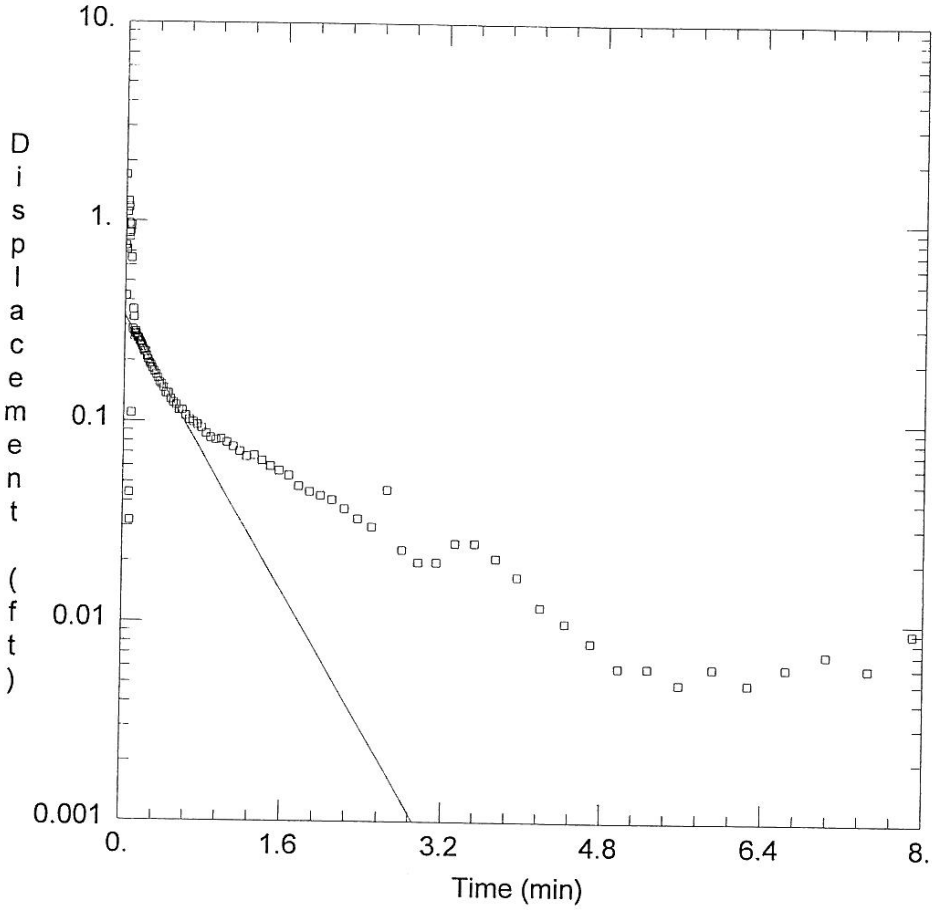
GENERALIZED STRATIGRAPHY

ELEVATIONS: GROUND SURFACE: 10.53
TOP OF CASING: 13.23



APPENDIX C

Aquifer Test Data



WELL TEST ANALYSIS

Data Set: P:\Dominion Chesapeake GC\Hydro Study\03 - Slug Test\Cleveland Files\mw02fh.aqt
Date: 09/07/01 Time: 12:40:19

PROJECT INFORMATION

Test Well: Falling Head

AQUIFER DATA

Saturated Thickness: 36. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW2)

Initial Displacement: 1.706 ft
Wellbore Radius: 0.333 ft
Screen Length: 10. ft
Casing Radius: 0.08333 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 17. ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0008455 cm/sec
y0 = 0.3348 ft

In-Situ Inc. Troll

Report generated: 08/10/01 14:27:50
Report from file: P:\Dominion Chesapeake GC\Hydro Study\03- Slug Test\Mw2nefh.bin
DataMgr Version 3.68

Serial number: 00012080
Firmware Version 6.24
Unit name: SP4000

Test name: MW2NEfh

Test defined on: 08/01/01 16:09:16
Test started on: 08/01/01 16:13:53
Test stopped on: 08/01/01 16:34:18
Test extracted on: 08/02/01 12:16:45

Data gathered using Logarithmic testing
Maximum time between data points: 5.0000 Minutes.
Number of data samples: 113

TOTAL DATA SAMPLES 113

Channel number [1]
Measurement type: Temperature
Channel name: OnBoard Temp

Channel number [2]
Measurement type: Pressure
Channel name: OnBoard Pressure
Sensor Range: 15 PSI.

Date	Time	ET (min)	Chan[1] Celsius	Chan[2] PSI
08/01/01	16:13:53	0.0000	14.88	10.366
08/01/01	16:13:53	0.0050	14.88	9.413
08/01/01	16:13:53	0.0100	14.89	9.082
08/01/01	16:13:53	0.0150	14.89	9.377
08/01/01	16:13:54	0.0200	14.90	9.760
08/01/01	16:13:54	0.0250	14.90	9.912
08/01/01	16:13:54	0.0300	14.90	9.826
08/01/01	16:13:55	0.0350	14.90	9.627
08/01/01	16:13:55	0.0400	14.91	9.526
08/01/01	16:13:55	0.0450	14.92	9.547
08/01/01	16:13:56	0.0500	14.92	9.608
08/01/01	16:13:56	0.0550	14.92	9.615
08/01/01	16:13:56	0.0600	14.92	9.309
08/01/01	16:13:56	0.0650	14.93	8.704
08/01/01	16:13:57	0.0700	14.93	8.692
08/01/01	16:13:57	0.0750	14.93	8.770
08/01/01	16:13:57	0.0800	14.93	8.945
08/01/01	16:13:58	0.0850	14.94	9.020
08/01/01	16:13:58	0.0900	14.95	8.990
08/01/01	16:13:58	0.0950	14.95	8.938
08/01/01	16:13:59	0.1000	14.95	8.924
08/01/01	16:13:59	0.1058	14.95	8.932
08/01/01	16:13:59	0.1120	14.95	8.939
08/01/01	16:14:00	0.1185	14.96	8.929
08/01/01	16:14:00	0.1255	14.96	8.922
08/01/01	16:14:00	0.1328	14.96	8.919
08/01/01	16:14:01	0.1407	14.96	8.918
08/01/01	16:14:01	0.1490	14.96	8.910
08/01/01	16:14:02	0.1578	14.97	8.906
08/01/01	16:14:03	0.1672	14.98	8.901
08/01/01	16:14:03	0.1770	14.99	8.894
08/01/01	16:14:04	0.1875	15.00	8.886
08/01/01	16:14:04	0.1985	15.00	8.882

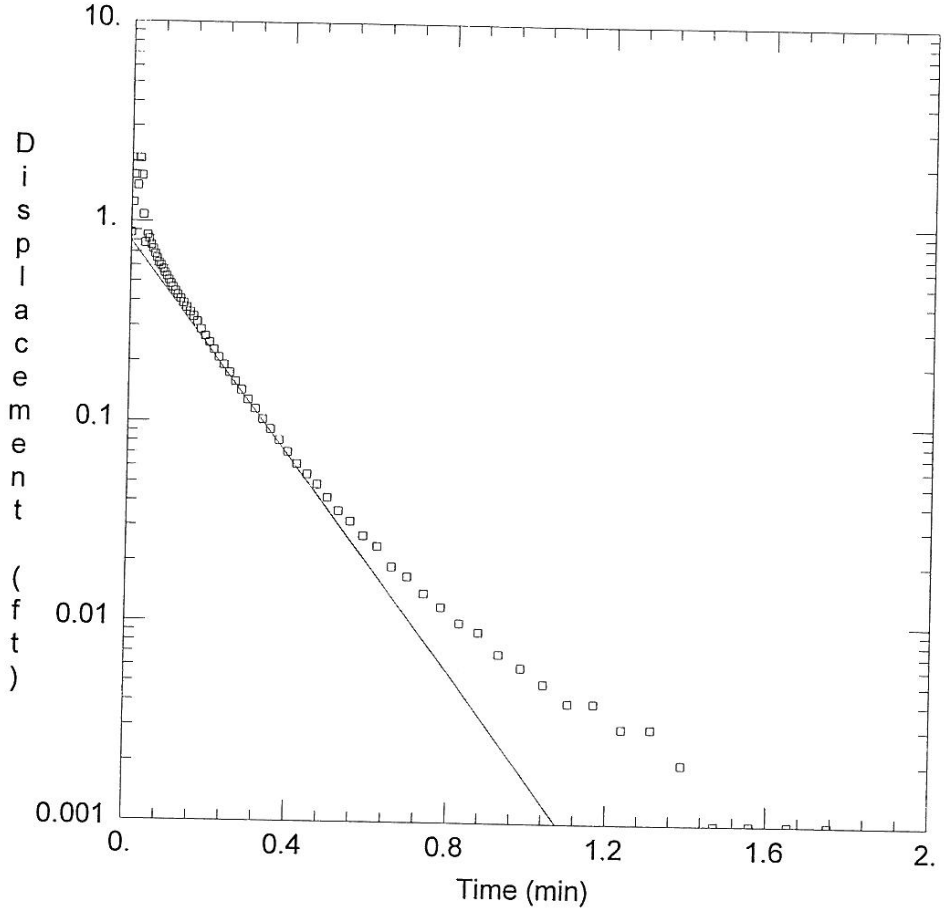
08/01/01	16:14:05	0.2102	15.00	8.882
08/01/01	16:14:06	0.2227	15.00	8.870
08/01/01	16:14:07	0.2358	15.00	8.862
08/01/01	16:14:07	0.2498	15.01	8.855
08/01/01	16:14:08	0.2647	15.01	8.850
08/01/01	16:14:09	0.2803	15.01	8.843
08/01/01	16:14:10	0.2970	15.01	8.837
08/01/01	16:14:11	0.3147	15.01	8.831
08/01/01	16:14:13	0.3333	15.02	8.824
08/01/01	16:14:14	0.3532	15.02	8.816
08/01/01	16:14:15	0.3742	15.02	8.813
08/01/01	16:14:16	0.3963	15.02	8.807
08/01/01	16:14:18	0.4198	15.02	8.798
08/01/01	16:14:19	0.4447	15.02	8.798
08/01/01	16:14:21	0.4697	15.02	8.789
08/01/01	16:14:22	0.4963	15.02	8.784
08/01/01	16:14:24	0.5247	15.02	8.781
08/01/01	16:14:26	0.5547	15.02	8.774
08/01/01	16:14:28	0.5863	15.02	8.774
08/01/01	16:14:30	0.6213	15.02	8.767
08/01/01	16:14:32	0.6580	15.02	8.762
08/01/01	16:14:34	0.6963	15.02	8.759
08/01/01	16:14:37	0.7380	15.02	8.756
08/01/01	16:14:39	0.7813	15.02	8.753
08/01/01	16:14:42	0.8280	15.02	8.747
08/01/01	16:14:45	0.8763	15.02	8.743
08/01/01	16:14:48	0.9280	15.02	8.741
08/01/01	16:14:51	0.9830	15.02	8.742
08/01/01	16:14:55	1.0413	15.02	8.739
08/01/01	16:14:59	1.1030	15.02	8.735
08/01/01	16:15:03	1.1680	15.01	8.731
08/01/01	16:15:07	1.2380	15.02	8.727
08/01/01	16:15:11	1.3113	15.02	8.728
08/01/01	16:15:16	1.3897	15.01	8.724
08/01/01	16:15:21	1.4730	15.01	8.720
08/01/01	16:15:26	1.5613	15.04	8.717
08/01/01	16:15:32	1.6547	15.06	8.714
08/01/01	16:15:38	1.7530	15.03	8.708
08/01/01	16:15:44	1.8580	15.07	8.705
08/01/01	16:15:51	1.9680	15.06	8.703
08/01/01	16:15:58	2.0847	15.07	8.701
08/01/01	16:16:05	2.2097	15.09	8.697
08/01/01	16:16:13	2.3413	15.13	8.693
08/01/01	16:16:21	2.4813	15.10	8.690
08/01/01	16:16:30	2.6297	15.17	8.706
08/01/01	16:16:40	2.7863	15.20	8.683
08/01/01	16:16:50	2.9530	15.22	8.680
08/01/01	16:17:00	3.1297	15.19	8.680
08/01/01	16:17:11	3.3163	15.17	8.685
08/01/01	16:17:23	3.5147	15.15	8.685
08/01/01	16:17:36	3.7247	15.13	8.681
08/01/01	16:17:49	3.9463	15.12	8.677
08/01/01	16:18:03	4.1813	15.11	8.672
08/01/01	16:18:18	4.4297	15.10	8.670
08/01/01	16:18:34	4.6930	15.09	8.668
08/01/01	16:18:51	4.9730	15.08	8.666
08/01/01	16:19:09	5.2697	15.12	8.666
08/01/01	16:19:27	5.5830	15.10	8.665
08/01/01	16:19:47	5.9147	15.08	8.666
08/01/01	16:20:08	6.2663	15.07	8.665
08/01/01	16:20:31	6.6397	15.07	8.666
08/01/01	16:20:55	7.0347	15.05	8.667
08/01/01	16:21:20	7.4530	15.04	8.666
08/01/01	16:21:46	7.8963	15.03	8.669
08/01/01	16:22:14	8.3663	15.02	8.666
08/01/01	16:22:44	8.8647	15.04	8.663
08/01/01	16:23:16	9.3913	15.02	8.661
08/01/01	16:23:49	9.9497	15.04	8.662
08/01/01	16:24:25	10.5413	15.02	8.660
08/01/01	16:25:03	11.1680	15.06	8.659

08/01/01	16:25:42	11.8313	15.04	8.659
08/01/01	16:26:25	12.5347	15.04	8.659
08/01/01	16:27:09	13.2797	15.07	8.662
08/01/01	16:27:57	14.0697	15.05	8.660
08/01/01	16:28:47	14.9063	15.04	8.660
08/01/01	16:29:40	15.7913	15.06	8.660
08/01/01	16:30:36	16.7297	15.06	8.660
08/01/01	16:31:36	17.7230	15.04	8.660
08/01/01	16:32:39	18.7763	15.06	8.662
08/01/01	16:33:46	19.8913	15.13	8.660

0	10.366
0.005	9.413
0.01	9.082
0.015	9.377
0.02	9.76
0.025	9.912
0.03	9.826
0.035	9.627
0.04	9.526
0.045	9.547
0.05	9.608
0.055	9.615
0.06	9.309
0.065	8.704
0.07	8.692
0.075	8.77
0.08	8.945
0.085	9.02
0.09	8.99
0.095	8.938
0.1	8.924
0.1058	8.932
0.112	8.939
0.1185	8.929
0.1255	8.922
0.1328	8.919
0.1407	8.918
0.149	8.91
0.1578	8.906
0.1672	8.901
0.177	8.894
0.1875	8.886
0.1985	8.882
0.2102	8.882
0.2227	8.87
0.2358	8.862
0.2498	8.855
0.2647	8.85
0.2803	8.843
0.297	8.837
0.3147	8.831
0.3333	8.824
0.3532	8.816
0.3742	8.813
0.3963	8.807
0.4198	8.798
0.4447	8.798
0.4697	8.789
0.4963	8.784

0.5247	8.781
0.5547	8.774
0.5863	8.774
0.6213	8.767
0.658	8.762
0.6963	8.759
0.738	8.756
0.7813	8.753
0.828	8.747
0.8763	8.743
0.928	8.741
0.983	8.742
1.0413	8.739
1.103	8.735
1.168	8.731
1.238	8.727
1.3113	8.728
1.3897	8.724
1.473	8.72
1.5613	8.717
1.6547	8.714
1.753	8.708
1.858	8.705
1.968	8.703
2.0847	8.701
2.2097	8.697
2.3413	8.693
2.4813	8.69
2.6297	8.706
2.7863	8.683
2.953	8.68
3.1297	8.68
3.3163	8.685
3.5147	8.685
3.7247	8.681
3.9463	8.677
4.1813	8.672
4.4297	8.67
4.693	8.668
4.973	8.666
5.2697	8.666
5.583	8.665
5.9147	8.666
6.2663	8.665
6.6397	8.666
7.0347	8.667
7.453	8.666
7.8963	8.669
8.3663	8.666

8.8647	8.663
9.3913	8.661
9.9497	8.662
10.5413	8.66
11.168	8.659
11.8313	8.659
12.5347	8.659
13.2797	8.662
14.0697	8.66
14.9063	8.66
15.7913	8.66
16.7297	8.66
17.723	8.66
18.7763	8.662
19.8913	8.66



WELL TEST ANALYSIS

Data Set: P:\Dominion Chesapeake GC\Hydro Study\03 - Slug Test\Cleveland Files\mw04rs.aqt
Date: 09/07/01 Time: 12:30:21

PROJECT INFORMATION

Test Well: Rising Head

AQUIFER DATA

Saturated Thickness: 36. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW4)

Initial Displacement: 2.065 ft
Wellbore Radius: 0.333 ft
Screen Length: 10. ft
Casing Radius: 0.08333 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 17. ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.002639 cm/sec
y0 = 0.7981 ft

In-Situ Inc. Troll

Report generated: 08/10/01 14:46:25
Report from file: P:\Dominion Chesapeake GC\Hydro Study\03- Slug Test\Mw4swrh.bin
DataMgr Version 3.68

Serial number: 00012080
Firmware Version 6.24
Unit name: SP4000

Test name: MW4SWrh

Test defined on: 08/01/01 17:19:15
Test started on: 08/01/01 17:33:14
Test stopped on: 08/01/01 17:39:24
Test extracted on: 08/02/01 12:18:15

Data gathered using Logarithmic testing
Maximum time between data points: 1.0000 Minutes.
Number of data samples: 92

TOTAL DATA SAMPLES 92

Channel number [1]
Measurement type: Temperature
Channel name: OnBoard Temp

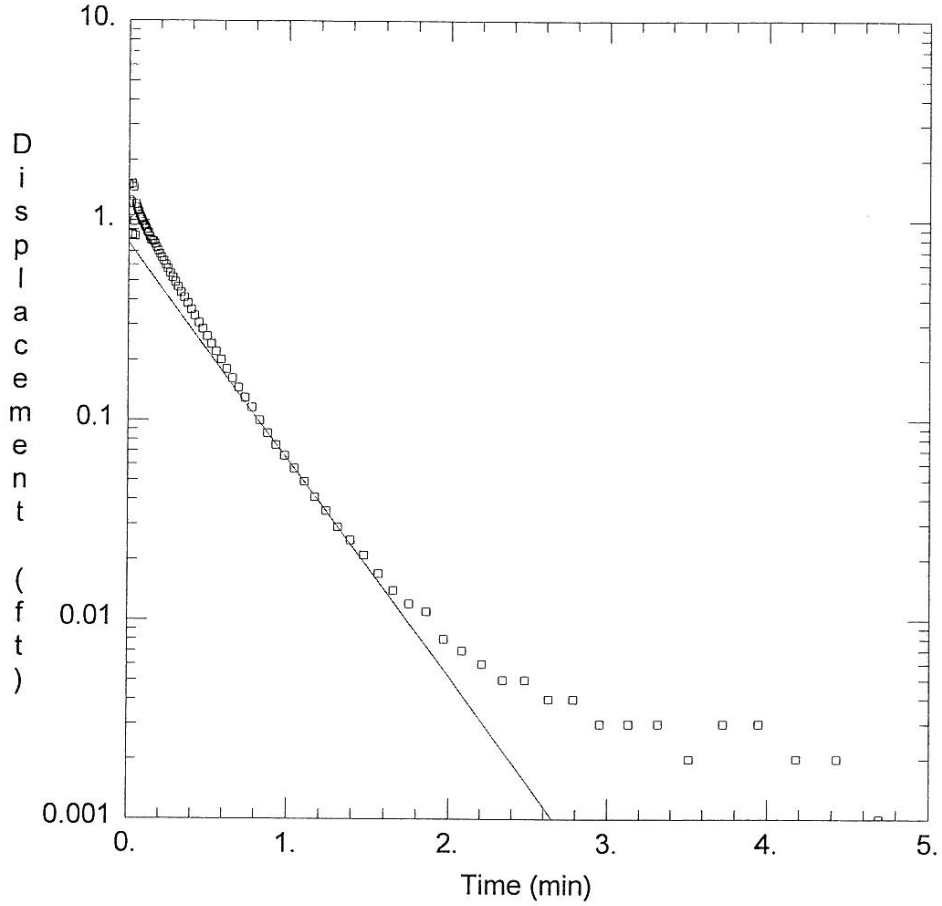
Channel number [2]
Measurement type: Pressure
Channel name: OnBoard Pressure
Sensor Range: 15 PSI.

Date	Time	ET (min)	Chan[1] Celsius	Chan[2] PSI
08/01/01	17:33:14	0.0000	15.41	8.312
08/01/01	17:33:14	0.0050	15.41	7.945
08/01/01	17:33:14	0.0100	15.42	7.478
08/01/01	17:33:14	0.0150	15.42	7.669
08/01/01	17:33:15	0.0200	15.42	7.120
08/01/01	17:33:15	0.0250	15.43	7.492
08/01/01	17:33:15	0.0300	15.43	8.109
08/01/01	17:33:16	0.0350	15.43	8.409
08/01/01	17:33:16	0.0400	15.44	8.331
08/01/01	17:33:16	0.0450	15.44	8.371
08/01/01	17:33:17	0.0500	15.44	8.426
08/01/01	17:33:17	0.0550	15.44	8.460
08/01/01	17:33:17	0.0600	15.45	8.502
08/01/01	17:33:17	0.0650	15.45	8.533
08/01/01	17:33:18	0.0700	15.45	8.568
08/01/01	17:33:18	0.0750	15.45	8.587
08/01/01	17:33:18	0.0800	15.45	8.610
08/01/01	17:33:19	0.0850	15.46	8.634
08/01/01	17:33:19	0.0900	15.46	8.656
08/01/01	17:33:19	0.0950	15.46	8.678
08/01/01	17:33:20	0.1000	15.46	8.699
08/01/01	17:33:20	0.1058	15.46	8.719
08/01/01	17:33:20	0.1120	15.47	8.738
08/01/01	17:33:21	0.1185	15.47	8.757
08/01/01	17:33:21	0.1255	15.47	8.776
08/01/01	17:33:21	0.1328	15.47	8.796
08/01/01	17:33:22	0.1407	15.47	8.815
08/01/01	17:33:22	0.1490	15.48	8.833
08/01/01	17:33:23	0.1578	15.48	8.851
08/01/01	17:33:24	0.1672	15.48	8.870
08/01/01	17:33:24	0.1770	15.50	8.897
08/01/01	17:33:25	0.1875	15.50	8.917
08/01/01	17:33:25	0.1985	15.50	8.937

08/01/01	17:33:26	0.2102	15.50	8.956
08/01/01	17:33:27	0.2227	15.51	8.976
08/01/01	17:33:28	0.2358	15.50	8.993
08/01/01	17:33:28	0.2498	15.50	9.009
08/01/01	17:33:29	0.2647	15.50	9.026
08/01/01	17:33:30	0.2803	15.51	9.041
08/01/01	17:33:31	0.2970	15.50	9.056
08/01/01	17:33:32	0.3147	15.51	9.069
08/01/01	17:33:34	0.3333	15.51	9.082
08/01/01	17:33:35	0.3532	15.51	9.093
08/01/01	17:33:36	0.3742	15.50	9.104
08/01/01	17:33:37	0.3963	15.50	9.114
08/01/01	17:33:39	0.4198	15.50	9.123
08/01/01	17:33:40	0.4447	15.50	9.130
08/01/01	17:33:42	0.4697	15.50	9.136
08/01/01	17:33:43	0.4963	15.50	9.143
08/01/01	17:33:45	0.5247	15.50	9.149
08/01/01	17:33:47	0.5547	15.50	9.153
08/01/01	17:33:49	0.5863	15.50	9.158
08/01/01	17:33:51	0.6213	15.49	9.161
08/01/01	17:33:53	0.6580	15.49	9.166
08/01/01	17:33:55	0.6963	15.48	9.168
08/01/01	17:33:58	0.7380	15.48	9.171
08/01/01	17:34:00	0.7813	15.48	9.173
08/01/01	17:34:03	0.8280	15.48	9.175
08/01/01	17:34:06	0.8763	15.47	9.176
08/01/01	17:34:09	0.9280	15.47	9.178
08/01/01	17:34:12	0.9830	15.46	9.179
08/01/01	17:34:16	1.0413	15.46	9.180
08/01/01	17:34:20	1.1030	15.45	9.181
08/01/01	17:34:24	1.1680	15.45	9.181
08/01/01	17:34:28	1.2380	15.44	9.182
08/01/01	17:34:32	1.3113	15.43	9.182
08/01/01	17:34:37	1.3897	15.42	9.183
08/01/01	17:34:42	1.4730	15.42	9.184
08/01/01	17:34:47	1.5613	15.41	9.184
08/01/01	17:34:53	1.6547	15.40	9.184
08/01/01	17:34:59	1.7530	15.39	9.184
08/01/01	17:35:05	1.8580	15.39	9.185
08/01/01	17:35:12	1.9680	15.38	9.185
08/01/01	17:35:19	2.0847	15.37	9.185
08/01/01	17:35:26	2.2097	15.36	9.184
08/01/01	17:35:34	2.3413	15.35	9.185
08/01/01	17:35:42	2.4813	15.34	9.185
08/01/01	17:35:51	2.6297	15.33	9.185
08/01/01	17:36:01	2.7863	15.32	9.185
08/01/01	17:36:11	2.9530	15.33	9.184
08/01/01	17:36:21	3.1297	15.33	9.184
08/01/01	17:36:32	3.3163	15.39	9.184
08/01/01	17:36:44	3.5147	15.36	9.185
08/01/01	17:36:57	3.7247	15.34	9.185
08/01/01	17:37:10	3.9463	15.32	9.185
08/01/01	17:37:24	4.1813	15.30	9.185
08/01/01	17:37:39	4.4297	15.27	9.184
08/01/01	17:37:55	4.6930	15.30	9.184
08/01/01	17:38:12	4.9730	15.31	9.185
08/01/01	17:38:30	5.2697	15.28	9.185
08/01/01	17:38:48	5.5830	15.26	9.185
08/01/01	17:39:08	5.9147	15.27	9.185

0	8.312
0.005	7.945
0.01	7.478
0.015	7.669
0.02	7.12
0.025	7.492
0.03	8.109
0.035	8.409
0.04	8.331
0.045	8.371
0.05	8.426
0.055	8.46
0.06	8.502
0.065	8.533
0.07	8.568
0.075	8.587
0.08	8.61
0.085	8.634
0.09	8.656
0.095	8.678
0.1	8.699
0.1058	8.719
0.112	8.738
0.1185	8.757
0.1255	8.776
0.1328	8.796
0.1407	8.815
0.149	8.833
0.1578	8.851
0.1672	8.87
0.177	8.897
0.1875	8.917
0.1985	8.937
0.2102	8.956
0.2227	8.976
0.2358	8.993
0.2498	9.009
0.2647	9.026
0.2803	9.041
0.297	9.056
0.3147	9.069
0.3333	9.082
0.3532	9.093
0.3742	9.104
0.3963	9.114
0.4198	9.123
0.4447	9.13
0.4697	9.136
0.4963	9.143

0.5247	9.149
0.5547	9.153
0.5863	9.158
0.6213	9.161
0.658	9.166
0.6963	9.168
0.738	9.171
0.7813	9.173
0.828	9.175
0.8763	9.176
0.928	9.178
0.983	9.179
1.0413	9.18
1.103	9.181
1.168	9.181
1.238	9.182
1.3113	9.182
1.3897	9.183
1.473	9.184
1.5613	9.184
1.6547	9.184
1.753	9.184
1.858	9.185
1.968	9.185
2.0847	9.185
2.2097	9.184
2.3413	9.185
2.4813	9.185
2.6297	9.185
2.7863	9.185
2.953	9.184
3.1297	9.184
3.3163	9.184
3.5147	9.185
3.7247	9.185
3.9463	9.185
4.1813	9.185
4.4297	9.184
4.693	9.184
4.973	9.185
5.2697	9.185
5.583	9.185
5.9147	9.185



WELL TEST ANALYSIS

Data Set: P:\Dominion Chesapeake GC\Hydro Study\03 - Slug Test\Cleveland Files\mw02rs.aqt
Date: 09/07/01 Time: 12:01:16

PROJECT INFORMATION

Test Well: Rising Head

AQUIFER DATA

Saturated Thickness: 36. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW2)

Initial Displacement: 1.5 ft
Wellbore Radius: 0.333 ft
Screen Length: 10. ft
Casing Radius: 0.08333 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 17. ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.001066 cm/sec
y0 = 0.7745 ft

In-Situ Inc. Troll

Report generated: 08/10/01 14:27:04
Report from file: P:\Dominion Chesapeake GC\Hydro Study\03- Slug Test\Mw2nerh.bin
DataMgr Version 3.68

Serial number: 00012080
Firmware Version 6.24
Unit name: SP4000

Test name: MW2NErh

Test defined on: 08/01/01 16:09:50
Test started on: 08/01/01 16:35:18
Test stopped on: 08/01/01 16:43:18
Test extracted on: 08/02/01 12:01:14

Data gathered using Logarithmic testing
Maximum time between data points: 1.0000 Minutes.
Number of data samples: 97

TOTAL DATA SAMPLES 97

Channel number [1]
Measurement type: Temperature
Channel name: OnBoard Temp

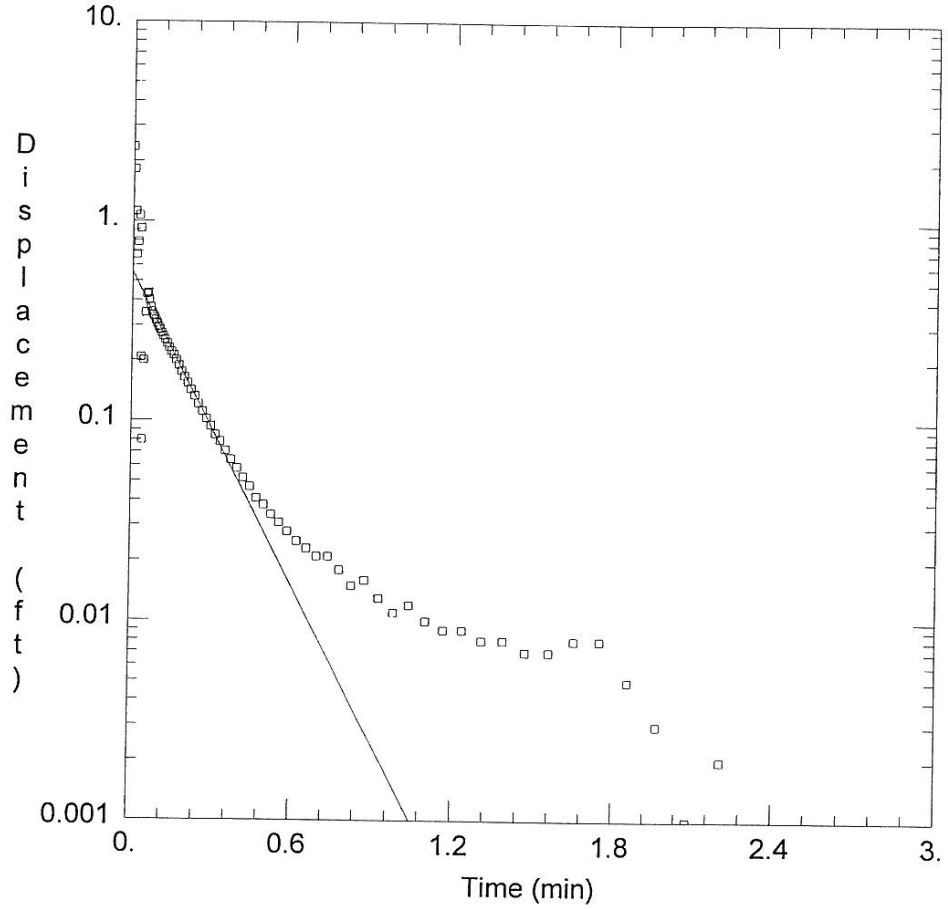
Channel number [2]
Measurement type: Pressure
Channel name: OnBoard Pressure
Sensor Range: 15 PSI.

Date	Time	ET (min)	Chan[1] Celsius	Chan[2] PSI
08/01/01	16:35:18	0.0000	15.10	7.456
08/01/01	16:35:18	0.0050	15.10	7.408
08/01/01	16:35:18	0.0100	15.10	7.555
08/01/01	16:35:18	0.0150	15.10	7.431
08/01/01	16:35:19	0.0200	15.11	7.143
08/01/01	16:35:19	0.0250	15.12	7.811
08/01/01	16:35:19	0.0300	15.12	7.191
08/01/01	16:35:20	0.0350	15.12	7.672
08/01/01	16:35:20	0.0400	15.12	7.822
08/01/01	16:35:20	0.0450	15.13	7.458
08/01/01	16:35:21	0.0500	15.13	7.499
08/01/01	16:35:21	0.0550	15.13	7.522
08/01/01	16:35:21	0.0600	15.14	7.542
08/01/01	16:35:21	0.0650	15.15	7.565
08/01/01	16:35:22	0.0700	15.14	7.599
08/01/01	16:35:22	0.0750	15.15	7.628
08/01/01	16:35:22	0.0800	15.15	7.641
08/01/01	16:35:23	0.0850	15.15	7.667
08/01/01	16:35:23	0.0900	15.15	7.682
08/01/01	16:35:23	0.0950	15.16	7.705
08/01/01	16:35:24	0.1000	15.16	7.725
08/01/01	16:35:24	0.1058	15.16	7.738
08/01/01	16:35:24	0.1120	15.16	7.753
08/01/01	16:35:25	0.1185	15.17	7.780
08/01/01	16:35:25	0.1255	15.17	7.797
08/01/01	16:35:25	0.1328	15.17	7.834
08/01/01	16:35:26	0.1407	15.17	7.861
08/01/01	16:35:26	0.1490	15.18	7.869
08/01/01	16:35:27	0.1578	15.18	7.877
08/01/01	16:35:28	0.1672	15.19	7.898
08/01/01	16:35:28	0.1770	15.20	7.930
08/01/01	16:35:29	0.1875	15.21	7.955
08/01/01	16:35:29	0.1985	15.21	7.981

08/01/01	16:35:30	0.2102	15.21	8.007
08/01/01	16:35:31	0.2227	15.21	8.034
08/01/01	16:35:32	0.2358	15.21	8.061
08/01/01	16:35:32	0.2498	15.21	8.087
08/01/01	16:35:33	0.2647	15.22	8.115
08/01/01	16:35:34	0.2803	15.22	8.142
08/01/01	16:35:35	0.2970	15.22	8.169
08/01/01	16:35:36	0.3147	15.22	8.196
08/01/01	16:35:38	0.3333	15.22	8.223
08/01/01	16:35:39	0.3532	15.22	8.249
08/01/01	16:35:40	0.3742	15.22	8.276
08/01/01	16:35:41	0.3963	15.22	8.302
08/01/01	16:35:43	0.4198	15.23	8.327
08/01/01	16:35:44	0.4447	15.22	8.353
08/01/01	16:35:46	0.4697	15.22	8.375
08/01/01	16:35:47	0.4963	15.23	8.398
08/01/01	16:35:49	0.5247	15.22	8.420
08/01/01	16:35:51	0.5547	15.23	8.441
08/01/01	16:35:53	0.5863	15.23	8.460
08/01/01	16:35:55	0.6213	15.23	8.481
08/01/01	16:35:57	0.6580	15.23	8.499
08/01/01	16:35:59	0.6963	15.22	8.515
08/01/01	16:36:02	0.7380	15.25	8.531
08/01/01	16:36:04	0.7813	15.27	8.545
08/01/01	16:36:07	0.8280	15.28	8.561
08/01/01	16:36:10	0.8763	15.27	8.575
08/01/01	16:36:13	0.9280	15.27	8.586
08/01/01	16:36:16	0.9830	15.27	8.595
08/01/01	16:36:20	1.0413	15.30	8.604
08/01/01	16:36:24	1.1030	15.33	8.612
08/01/01	16:36:28	1.1680	15.32	8.620
08/01/01	16:36:32	1.2380	15.33	8.626
08/01/01	16:36:36	1.3113	15.36	8.632
08/01/01	16:36:41	1.3897	15.39	8.636
08/01/01	16:36:46	1.4730	15.41	8.640
08/01/01	16:36:51	1.5613	15.39	8.644
08/01/01	16:36:57	1.6547	15.38	8.647
08/01/01	16:37:03	1.7530	15.36	8.649
08/01/01	16:37:09	1.8580	15.41	8.650
08/01/01	16:37:16	1.9680	15.39	8.653
08/01/01	16:37:23	2.0847	15.37	8.654
08/01/01	16:37:30	2.2097	15.36	8.655
08/01/01	16:37:38	2.3413	15.34	8.656
08/01/01	16:37:46	2.4813	15.34	8.656
08/01/01	16:37:55	2.6297	15.32	8.657
08/01/01	16:38:05	2.7863	15.32	8.657
08/01/01	16:38:15	2.9530	15.30	8.658
08/01/01	16:38:25	3.1297	15.30	8.658
08/01/01	16:38:36	3.3163	15.28	8.658
08/01/01	16:38:48	3.5147	15.27	8.659
08/01/01	16:39:01	3.7247	15.28	8.658
08/01/01	16:39:14	3.9463	15.30	8.658
08/01/01	16:39:28	4.1813	15.28	8.659
08/01/01	16:39:43	4.4297	15.27	8.659
08/01/01	16:39:59	4.6930	15.25	8.660
08/01/01	16:40:16	4.9730	15.24	8.660
08/01/01	16:40:34	5.2697	15.23	8.660
08/01/01	16:40:52	5.5830	15.22	8.660
08/01/01	16:41:12	5.9147	15.21	8.660
08/01/01	16:41:33	6.2663	15.22	8.659
08/01/01	16:41:56	6.6397	15.20	8.661
08/01/01	16:42:20	7.0347	15.22	8.658
08/01/01	16:42:45	7.4530	15.21	8.659
08/01/01	16:43:11	7.8963	15.25	8.659

0	7.456
0.005	7.408
0.01	7.555
0.015	7.431
0.02	7.143
0.025	7.811
0.03	7.191
0.035	7.672
0.04	7.822
0.045	7.458
0.05	7.499
0.055	7.522
0.06	7.542
0.065	7.565
0.07	7.599
0.075	7.628
0.08	7.641
0.085	7.667
0.09	7.682
0.095	7.705
0.1	7.725
0.1058	7.738
0.112	7.753
0.1185	7.78
0.1255	7.797
0.1328	7.834
0.1407	7.861
0.149	7.869
0.1578	7.877
0.1672	7.898
0.177	7.93
0.1875	7.955
0.1985	7.981
0.2102	8.007
0.2227	8.034
0.2358	8.061
0.2498	8.087
0.2647	8.115
0.2803	8.142
0.297	8.169
0.3147	8.196
0.3333	8.223
0.3532	8.249
0.3742	8.276
0.3963	8.302
0.4198	8.327
0.4447	8.353
0.4697	8.375
0.4963	8.398

0.5247	8.42
0.5547	8.441
0.5863	8.46
0.6213	8.481
0.658	8.499
0.6963	8.515
0.738	8.531
0.7813	8.545
0.828	8.561
0.8763	8.575
0.928	8.586
0.983	8.595
1.0413	8.604
1.103	8.612
1.168	8.62
1.238	8.626
1.3113	8.632
1.3897	8.636
1.473	8.64
1.5613	8.644
1.6547	8.647
1.753	8.649
1.858	8.65
1.968	8.653
2.0847	8.654
2.2097	8.655
2.3413	8.656
2.4813	8.656
2.6297	8.657
2.7863	8.657
2.953	8.658
3.1297	8.658
3.3163	8.658
3.5147	8.659
3.7247	8.658
3.9463	8.658
4.1813	8.659
4.4297	8.659
4.693	8.66
4.973	8.66
5.2697	8.66
5.583	8.66
5.9147	8.66
6.2663	8.659
6.6397	8.661
7.0347	8.658
7.453	8.659
7.8963	8.659



WELL TEST ANALYSIS

Data Set: P:\Dominion Chesapeake GC\Hydro Study\03 - Slug Test\Cleveland Files\mw04fh.aqt
Date: 09/07/01 Time: 12:00:49

PROJECT INFORMATION

Test Well: Falling Head

AQUIFER DATA

Saturated Thickness: 36. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW4)

Initial Displacement: 2.361 ft
Wellbore Radius: 0.333 ft
Screen Length: 10. ft
Casing Radius: 0.08333 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 17. ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.002554 cm/sec
y0 = 0.5526 ft

In-Situ Inc. Troll

Report generated: 08/10/01 14:42:20
Report from file: P:\Dominion Chesapeake GC\Hydro Study\03- Slug Test\Mw4swfh.bin
DataMgr Version 3.68

Serial number: 00012080
Firmware Version 6.24
Unit name: SP4000

Test name: MW4SWfh

Test defined on: 08/01/01 17:18:39
Test started on: 08/01/01 17:22:22
Test stopped on: 08/01/01 17:32:29
Test extracted on: 08/02/01 12:05:13

Data gathered using Logarithmic testing
Maximum time between data points: 1.0000 Minutes.
Number of data samples: 101

TOTAL DATA SAMPLES 101

Channel number [1]
Measurement type: Temperature
Channel name: OnBoard Temp

Channel number [2]
Measurement type: Pressure
Channel name: OnBoard Pressure
Sensor Range: 15 PSI.

Date	Time	ET (min)	Chan[1] Celsius	Chan[2] PSI
08/01/01	17:22:22	0.0000	15.73	11.544
08/01/01	17:22:22	0.0050	15.73	11.005
08/01/01	17:22:22	0.0100	15.73	10.300
08/01/01	17:22:22	0.0150	15.74	9.859
08/01/01	17:22:23	0.0200	15.74	9.967
08/01/01	17:22:23	0.0250	15.74	10.247
08/01/01	17:22:23	0.0300	15.74	10.100
08/01/01	17:22:24	0.0350	15.75	9.390
08/01/01	17:22:24	0.0400	15.75	9.263
08/01/01	17:22:24	0.0450	15.75	9.383
08/01/01	17:22:25	0.0500	15.76	9.530
08/01/01	17:22:25	0.0550	15.76	9.611
08/01/01	17:22:25	0.0600	15.76	9.617
08/01/01	17:22:25	0.0650	15.77	9.585
08/01/01	17:22:26	0.0700	15.77	9.552
08/01/01	17:22:26	0.0750	15.77	9.532
08/01/01	17:22:26	0.0800	15.77	9.519
08/01/01	17:22:27	0.0850	15.77	9.511
08/01/01	17:22:27	0.0900	15.77	9.500
08/01/01	17:22:27	0.0950	15.77	9.489
08/01/01	17:22:28	0.1000	15.77	9.477
08/01/01	17:22:28	0.1058	15.78	9.468
08/01/01	17:22:28	0.1120	15.79	9.457
08/01/01	17:22:29	0.1185	15.79	9.447
08/01/01	17:22:29	0.1255	15.79	9.437
08/01/01	17:22:29	0.1328	15.79	9.426
08/01/01	17:22:30	0.1407	15.79	9.414
08/01/01	17:22:30	0.1490	15.79	9.404
08/01/01	17:22:31	0.1578	15.79	9.395
08/01/01	17:22:32	0.1672	15.80	9.384
08/01/01	17:22:32	0.1770	15.81	9.371
08/01/01	17:22:33	0.1875	15.81	9.358
08/01/01	17:22:33	0.1985	15.82	9.347

08/01/01	17:22:34	0.2102	15.82	9.337
08/01/01	17:22:35	0.2227	15.82	9.325
08/01/01	17:22:36	0.2358	15.82	9.315
08/01/01	17:22:36	0.2498	15.84	9.304
08/01/01	17:22:37	0.2647	15.84	9.294
08/01/01	17:22:38	0.2803	15.83	9.285
08/01/01	17:22:39	0.2970	15.84	9.277
08/01/01	17:22:40	0.3147	15.85	9.268
08/01/01	17:22:42	0.3333	15.85	9.262
08/01/01	17:22:43	0.3532	15.84	9.254
08/01/01	17:22:44	0.3742	15.84	9.247
08/01/01	17:22:45	0.3963	15.86	9.241
08/01/01	17:22:47	0.4198	15.85	9.235
08/01/01	17:22:48	0.4447	15.86	9.230
08/01/01	17:22:50	0.4697	15.87	9.224
08/01/01	17:22:51	0.4963	15.86	9.221
08/01/01	17:22:53	0.5247	15.87	9.217
08/01/01	17:22:55	0.5547	15.89	9.214
08/01/01	17:22:57	0.5863	15.88	9.211
08/01/01	17:22:59	0.6213	15.87	9.208
08/01/01	17:23:01	0.6580	15.86	9.206
08/01/01	17:23:03	0.6963	15.85	9.204
08/01/01	17:23:06	0.7380	15.85	9.204
08/01/01	17:23:08	0.7813	15.84	9.201
08/01/01	17:23:11	0.8280	15.84	9.198
08/01/01	17:23:14	0.8763	15.83	9.199
08/01/01	17:23:17	0.9280	15.85	9.196
08/01/01	17:23:20	0.9830	15.85	9.194
08/01/01	17:23:24	1.0413	15.85	9.195
08/01/01	17:23:28	1.1030	15.84	9.193
08/01/01	17:23:32	1.1680	15.82	9.192
08/01/01	17:23:36	1.2380	15.80	9.192
08/01/01	17:23:40	1.3113	15.81	9.191
08/01/01	17:23:45	1.3897	15.84	9.191
08/01/01	17:23:50	1.4730	15.81	9.190
08/01/01	17:23:55	1.5613	15.79	9.190
08/01/01	17:24:01	1.6547	15.77	9.191
08/01/01	17:24:07	1.7530	15.76	9.191
08/01/01	17:24:13	1.8580	15.74	9.188
08/01/01	17:24:20	1.9680	15.72	9.186
08/01/01	17:24:27	2.0847	15.70	9.184
08/01/01	17:24:34	2.2097	15.72	9.185
08/01/01	17:24:42	2.3413	15.73	9.183
08/01/01	17:24:50	2.4813	15.77	9.181
08/01/01	17:24:59	2.6297	15.73	9.182
08/01/01	17:25:09	2.7863	15.70	9.186
08/01/01	17:25:19	2.9530	15.71	9.184
08/01/01	17:25:29	3.1297	15.68	9.183
08/01/01	17:25:40	3.3163	15.70	9.184
08/01/01	17:25:52	3.5147	15.66	9.183
08/01/01	17:26:05	3.7247	15.63	9.184
08/01/01	17:26:18	3.9463	15.60	9.183
08/01/01	17:26:32	4.1813	15.57	9.182
08/01/01	17:26:47	4.4297	15.54	9.184
08/01/01	17:27:03	4.6930	15.51	9.185
08/01/01	17:27:20	4.9730	15.49	9.184
08/01/01	17:27:38	5.2697	15.46	9.184
08/01/01	17:27:56	5.5830	15.43	9.185
08/01/01	17:28:16	5.9147	15.45	9.184
08/01/01	17:28:37	6.2663	15.44	9.183
08/01/01	17:29:00	6.6397	15.46	9.183
08/01/01	17:29:24	7.0347	15.50	9.183
08/01/01	17:29:49	7.4530	15.52	9.183
08/01/01	17:30:15	7.8963	15.57	9.182
08/01/01	17:30:43	8.3663	15.51	9.184
08/01/01	17:31:13	8.8647	15.48	9.183
08/01/01	17:31:45	9.3913	15.43	9.184
08/01/01	17:32:18	9.9497	15.51	9.183

0	11.544
0.005	11.005
0.01	10.3
0.015	9.859
0.02	9.967
0.025	10.247
0.03	10.1
0.035	9.39
0.04	9.263
0.045	9.383
0.05	9.53
0.055	9.611
0.06	9.617
0.065	9.585
0.07	9.552
0.075	9.532
0.08	9.519
0.085	9.511
0.09	9.5
0.095	9.489
0.1	9.477
0.1058	9.468
0.112	9.457
0.1185	9.447
0.1255	9.437
0.1328	9.426
0.1407	9.414
0.149	9.404
0.1578	9.395
0.1672	9.384
0.177	9.371
0.1875	9.358
0.1985	9.347
0.2102	9.337
0.2227	9.325
0.2358	9.315
0.2498	9.304
0.2647	9.294
0.2803	9.285
0.297	9.277
0.3147	9.268
0.3333	9.262
0.3532	9.254
0.3742	9.247
0.3963	9.241
0.4198	9.235
0.4447	9.23
0.4697	9.224
0.4963	9.221

0.5247	9.217
0.5547	9.214
0.5863	9.211
0.6213	9.208
0.658	9.206
0.6963	9.204
0.738	9.204
0.7813	9.201
0.828	9.198
0.8763	9.199
0.928	9.196
0.983	9.194
1.0413	9.195
1.103	9.193
1.168	9.192
1.238	9.192
1.3113	9.191
1.3897	9.191
1.473	9.19
1.5613	9.19
1.6547	9.191
1.753	9.191
1.858	9.188
1.968	9.186
2.0847	9.184
2.2097	9.185
2.3413	9.183
2.4813	9.181
2.6297	9.182
2.7863	9.186
2.953	9.184
3.1297	9.183
3.3163	9.184
3.5147	9.183
3.7247	9.184
3.9463	9.183
4.1813	9.182
4.4297	9.184
4.693	9.185
4.973	9.184
5.2697	9.184
5.583	9.185
5.9147	9.184
6.2663	9.183
6.6397	9.183
7.0347	9.183
7.453	9.183
7.8963	9.182
8.3663	9.184

8.8647	9.183
9.3913	9.184
9.9497	9.183

APPENDIX D

Physical Testing Results

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 7.11
Specimen Diameter (cm): 7.18
Dry Unit Weight (pcf): 102.7
Moisture Before Test (%): 23.6
Moisture After Test (%): 21.1
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 70.0

Sat. Pressure (psi): 60.0
Diff. Head (psi): 2.3

Perm. (cm/sec): 8.20 x 10^-7

SAMPLE DATA:

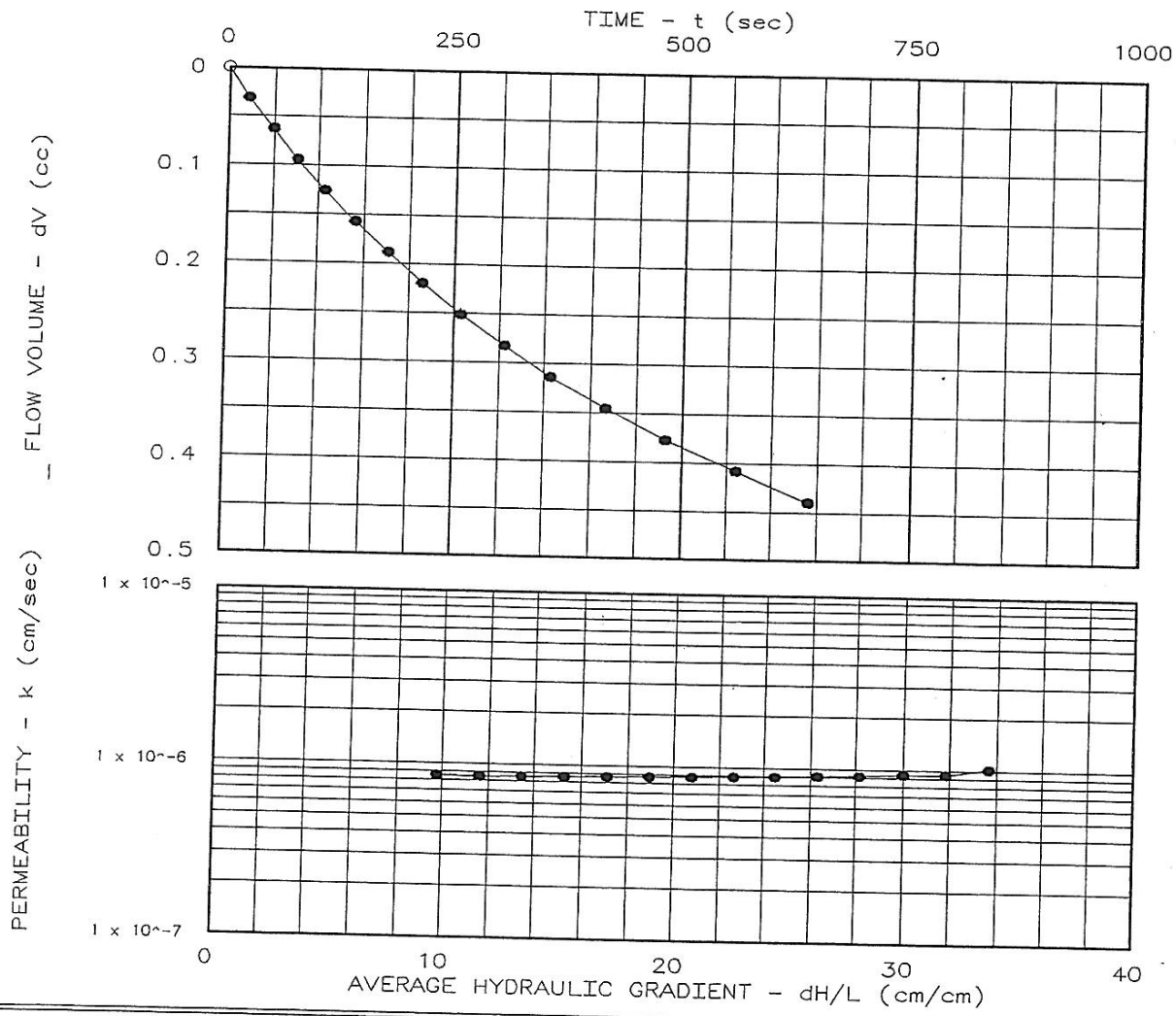
Sample Identification: B-1B, 0.5'-2.5'

Visual Description: Dark Gray Clayey SILT

Remarks: ASTM D5084

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexable Wall
Sample type: Undisturbed



Project: URS - CHESAPEAKE GOLF Location: Date: 8/10/01	Project No.: RC01-196 File No.: Lab No.: Tested by: RB Checked by: Test: CV - Constant volume
PERMEABILITY TEST REPORT **Atlantic Geotechnical Services, Inc.**	

20139

REPORT NUMBER

R215-003

Robbie

A&L EASTERN AGRICULTURAL LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237 • (804) 743-9401
Fax No. (804) 271-6446

ACCT # 73723

SEND TO: ATLANTIC GEOTECHNICAL SERVICES INC
10971 RICHARDSON RD
ASHLAND VA 23005

GROWER: CHESAPEAKE GOLF
RCOI-196

SAMPLES SUBMITTED BY: ROBBIE BARBOUR

DATE RECEIVED 08/02/2001
DATE OF ANALYSIS 08/03/2001

DATE OF REPORT 08/07/2001 PAGE 1

SOIL ANALYSIS REPORT

SAMPLE NUMBER	LAB NUMBER	ORGANIC MATTER % ENR lbs/A	PHOSPHORUS BRAY P1 ppm RATE	PHOSPHORUS BRAY P2 ppm RATE	POTASSIUM K ppm RATE	MAGNESIUM MG ppm RATE	CALCIUM CA ppm RATE	SODIUM NA ppm RATE	pH SOIL pH	pH BUFFER INDEX	ACIDITY H meq/100g	C.E.C. meq/100g
B-1	02584	0.4										
B-1B	02585	0.5										
B-2	02586	0.6										
B-3	02587	0.6										

SAMPLE NUMBER	PERCENT BASE SATURATION K %	Mg %	Ca %	Na %	H %	NITRATE NO3-N ppm RATE	SULFUR SO4-S ppm RATE	ZINC ZN ppm RATE	MANGANESE MN ppm RATE	IRON FE ppm RATE	COPPER CU ppm RATE	BORON B ppm RATE	SOLUBLE SALTS mmhos/cm RATE	CHLORIDE CL ppm RATE	MOLYBDENUM MO ppm RATE
									% TOC						
B-1									0.2						
B-1B									0.3						
B-2									0.3						
B-3									0.3						

Values on this report represent the plant available nutrients in the soil.
Explanation of symbols: Values are expressed as % (percent), ppm (parts per million), or lbs/A (pounds per acre).
Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High).
ENR – Estimated Nitrogen Release. C.E.C. – Cation Exchange Capacity.
To convert to lbs/A, multiply the results in ppm by 2.

This report applies to the sample(s) tested. Samples are retained a maximum of thirty days after testing. Soil Analysis prepared by:

A & L EASTERN AGRICULTURAL LABORATORIES, INC.

by C. NORMAN JONES

20140

10971 Richardson Road
Ashland, Virginia 23005
(804) 550-2203 Phone
(804) 550-2204 Fax

JOB NO. RC01-196 DATE 8/8/01 SHEET ____ OF ____

PROJECT NAME URS - Chesapeake Golf

CALC. BY _____ CHECKED BY _____ DATE _____

B-1, 20-22

Wt of sample + specimen tube bottom tube & coupling = 14.85 lbs
Wt of tubes + coupling = 5.30 lbs
Wt of sample = 9.55 lbs
Vol. specimen tube = 0.0756 ft³

Wet Density = 118.4 lbs/ft³
Moisture Content = 21.5%
Dry Density = 97.4 lbs/ft³

i = 10.62 - 6.55 / 11.58 = 0.35
A = 193.61 cm²
A_{tube} = 182.99 cm²

Time	t, sec	Reading	Q	$K = \frac{Q}{iAt}$
16:25:00		58.50		
16:34:00	300	58.10	72.80	3.8×10^{-3} ✓
16:39:00	300	57.90	54.60	2.8×10^{-3} ✓
16:44:00	300	57.50	54.60	2.8×10^{-3} ✓
16:49:00	300	57.20	54.60	2.8×10^{-3} ✓
16:54:00	300	56.90	54.60	2.8×10^{-3} ✓

Ave K = 2.8×10^{-3} ✓

20141

10971 Richardson Road
Ashland, Virginia 23005
(804) 550-2203 Phone
(804) 550-2204 Fax

JOB NO. R201-146 DATE 8/3/11 SHEET ____ OF ____

PROJECT NAME URS - Chesapeake Gate

CALC. BY _____ CHECKED BY _____ DATE _____

B-2, 18'-20'

Wt of Sample + tubes + coupling = 15.00 lbs
Wt of tubes + coupling = 5.90 lbs
Wt of Sample = 9.10 lbs
Vol. of Specimen tube = 0.0756 ft³

Wet Density = 120.4 lbs/ft³
Moisture Content = 22.0%
Dry Density = 98.7 lbs/ft³

i = 0.35
A = 183.61 cm²
A1-2 = 181.99 cm²

Time	Tube	Reading	Q	$K = \frac{Q}{iAt}$
13:17:00	600	51.10		
13:27:00	600	50.40	127.39	3.3×10^{-3}
13:37:00	600	49.80	109.19	2.8×10^{-3} ✓
13:47:00	600	49.15	118.29	3.1×10^{-3} ✓
13:57:00	600	48.50	118.29	3.1×10^{-3} ✓
14:07:00	600	47.95	100.09	2.6×10^{-3}

Ave K = 3.0×10^{-3}

20142

10971 Richardson Road
Ashland, Virginia 23005
(804) 550-2203 Phone
(804) 550-2204 Fax

JOB NO. [illegible] DATE [illegible] SHEET ____ OF ____

PROJECT NAME [illegible]

CALC. BY ____ CHECKED BY ____ DATE ____

B-3, 18' - 28'

Wt of Sample + Tube + Coupling = 14.[illegible] lbs
Wt of Tube + Coupling = 5.90 lbs
Wt of Sample = 8.4[illegible] lbs
Vol. of Sampling Tube = 0.0[illegible] ft³

Wet Density = 1[illegible].3 lbs/ft³
Moisture Content = 20.2 %
Dry Density = 9[illegible].4 lbs/ft³

i = 0.35
A = 1[illegible] cm²
A1-2 = 1[illegible] cm²

Time	Time	Reading	Q	$K = \frac{Q}{iAt}$
7:15:00		55.00		
7:30:00	900	51.30	127.93	2.2×10^{-3}
7:45:00	900	52.50	145.59	2.8×10^{-3}
8:00:00	900	52.75	136.49	2.4×10^{-3}
8:15:00	900	52.00	136.49	2.4×10^{-3}
8:30:00	900	51.25	136.49	2.4×10^{-3}
8:45:00	900	50.50	136.49	2.4×10^{-3}

Avg $K = 2.4 \times 10^{-3}$

20143

WATER (MOISTURE) CONTENT/VISUAL CLASSIFICATION
(ASTM D 2216, D 2488)

Project No. [illegible] Project Name:

Tested By: Date Tested: 8/7/01

Computed By: Checked By:

Hole No.	Sample No.	Depth, Ft.	Tare No.	Tare, Grams	Wet Wt. + Tare	Dry Wt. + Tare	Water Content, %	Soil Description
B-1		20'-22'	468	35.40	211.35	180.21	(22.2) 21.5	Remolded Rom fill soils
B-2		18'-20'	D18	35.35	240.57	203.50	(22.1) 22.0	
B-3		18'-20'	E46	35.09	236.20	202.6	(19.7) 20.2	

Remarks:

Water.vis

20144

12" CONSTANT HEAD PERMEAMETER

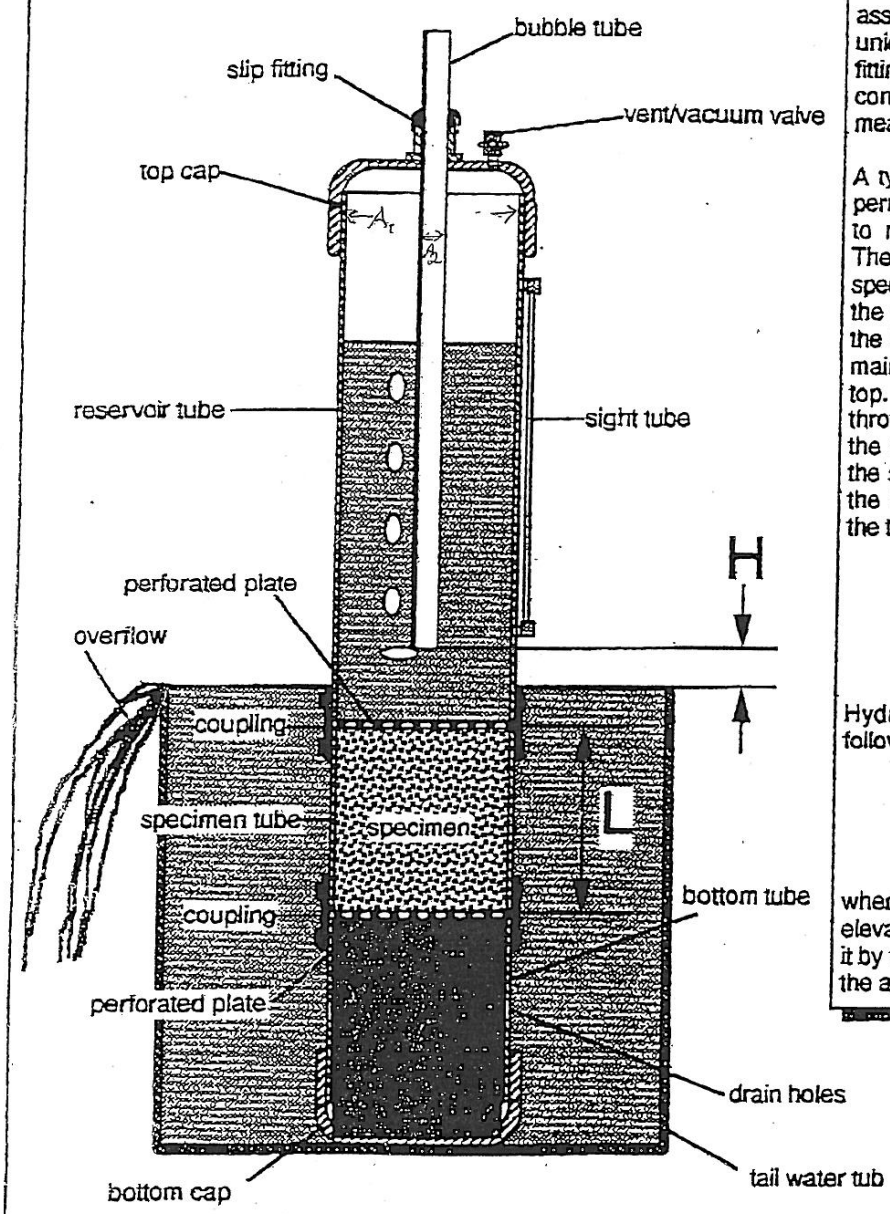


Figure 1. Test Set Up

The 12" Constant Head Permeameter is designed to accommodate the high flow rates associated with testing coarse grain soils. The unique design eliminates the use of valves, fittings, and small diameter tubing, all of which contribute head losses that interfere with test measurements.

A typical test set up is shown in Fig. 1. The permeameter is placed in a tub which is used to maintain a constant tail water elevation. The tub rim is located a few inches above the specimen top. During testing, water flows from the reservoir tube, through the specimen, out the bottom drains and into the tub. The tub is maintained full such the water overflows the top. As water flows out of the reservoir tube through the specimen, bubbles emerge from the bubble tube. The head difference across the specimen is the height difference between the bottom of the bubble tube and the top of the tub. The gradient is determined as follows:

$$i = \frac{H}{L}$$

Hydraulic conductivity is determined as follows:

$$k = \frac{Q}{i \cdot A \cdot t}$$

where Q is determined by noting the water elevation drop in the sight tube and multiplying it by the inner area of the reservoir tube (minus the area of the bubble tube).

$Q = A_1 - A_2$

$A = A_1$

soil testing equipment
TRAUTWEIN
P.O.Box 31425 - Houston, TX 77231-TEL.:713/721-1366

N	X FACTOR	N	FACTOR
20°	0.974	26°	1.005
21°	0.979	27°	1.009
22°	0.984	28°	1.014
23°	0.990	29°	1.018
24°	0.995	30°	1.022
25°	1.000		

*

LIQUID AND PLASTIC LIMIT TESTS

For use of this form, see EM 1110-2-1906.

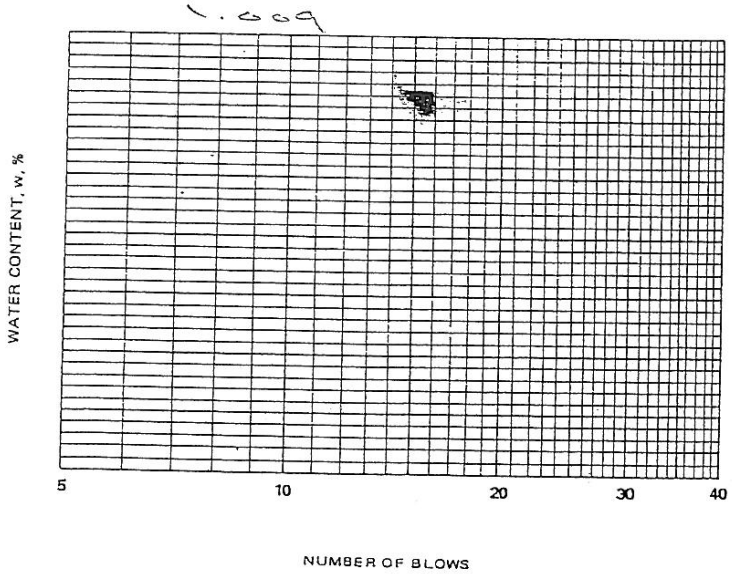
PROJECT RC01-196 DATE 8/4/01

BORING NO. B-18 SAMPLE NO. ST, 0.5'-2.5'

LIQUID LIMIT

RUN NO.		1	2	3	4	5	6
TARE NO.		F13	205	MF			
WEIGHT IN GRAMS: TARE PLUS WET SOIL		46.58	45.89				
TARE PLUS DRY SOIL		38.24	37.76				
WATER	W_w						
TARE		17.15	17.03	21.65			
DRY SOIL	W_s						
WATER CONTENT, %	w	39.5	39.2				
NUMBER OF BLOWS		26	28				

1.009



LL 40

PL 20

PI 20

Symbol from plasticity chart

PLASTIC LIMIT

RUN NO.		1	2	3	4	5	NATURAL WATER CONTENT
TARE NO.		A1	01				
WEIGHT IN GRAMS: TARE PLUS WET SOIL		20.51	18.19				
TARE PLUS DRY SOIL		19.37	18.12				
WATER	W_w						
TARE		13.50	8.24				
DRY SOIL	W_s						
WATER CONTENT, %	w	19.4	19.3				
PLASTIC LIMIT							

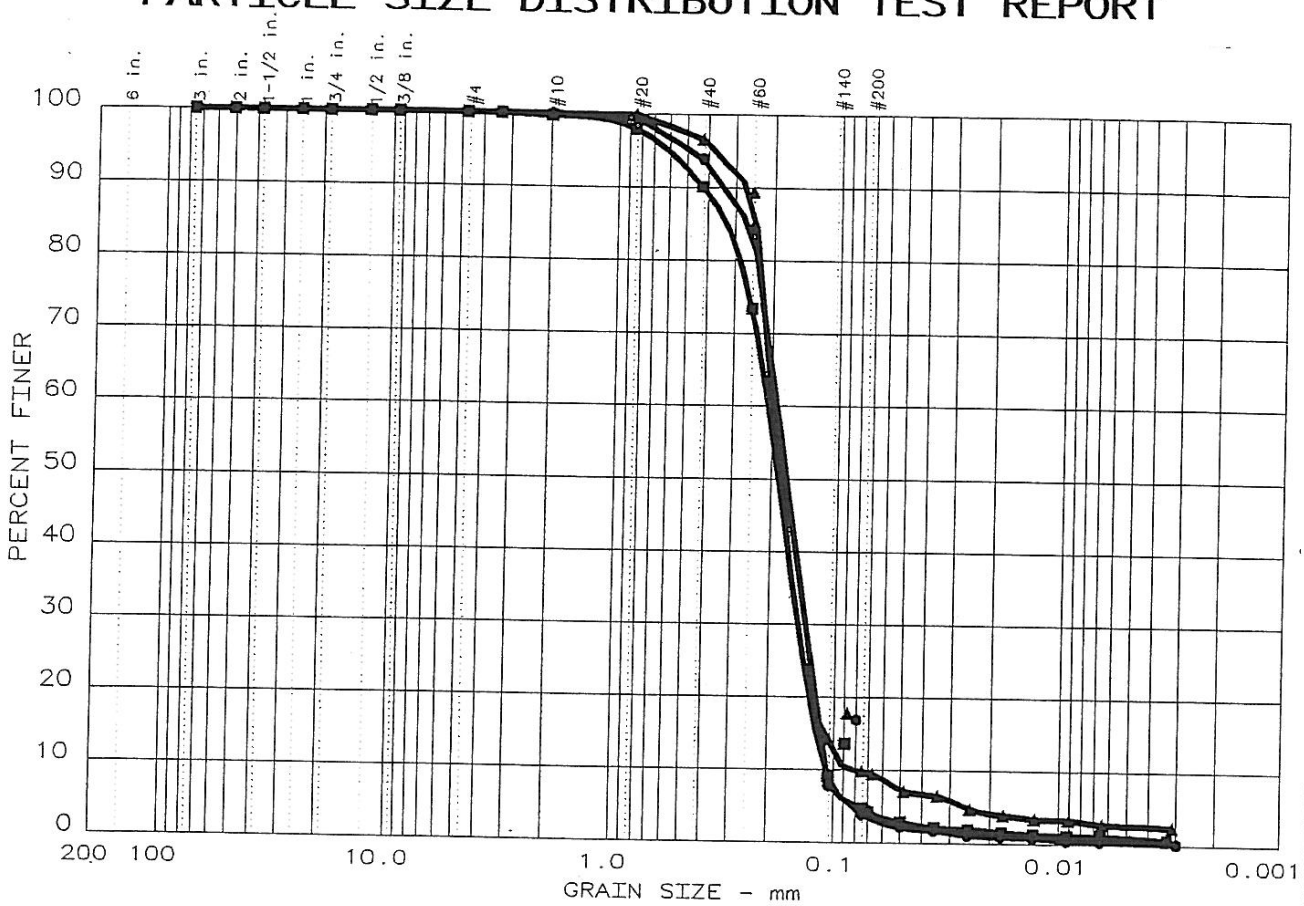
REMARKS

TECHNICIAN COMPUTED BY CHECKED BY

ENG FORM 1 JUN 65 3838 GPO : 1983 0 - 407-134 PLATE III-1

*

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	1	0.0	0.0	96.2	3.4	0.4	SP		NP
▲	2	0.0	0.0	90.1	7.3	2.6	SP-SM		NP
■	3	0.0	0.0	95.3	3.8	0.9	SP		NP

SIEVE inches size	PERCENT FINER ●	▲	■
3	100.0	100.0	100.0
2	100.0	100.0	100.0
1.5	100.0	100.0	100.0
1		100.0	100.0
0.75	100.0	100.0	100.0
0.5	100.0	100.0	100.0
0.375	100.0	100.0	100.0
	GRAIN SIZE		
D_{60}	0.190	0.197	0.208
D_{30}			
D_{10}	0.108	0.0838	0.108
	COEFFICIENTS		
C_c	0.90	1.32	0.97
C_u	1.8	2.4	1.9

SIEVE number size	PERCENT FINER ●	▲	■
4	100.0	100.0	100.0
6	100.0	100.0	100.0
10	100.0	99.9	99.7
20	99.4	99.9	97.9
40	93.9	96.6	90.1
60	84.4	89.4	73.4
140	7.8	14.3	9.1
200	3.8	9.9	4.7

Sample information:

● B-1, 20'-22' Gray Poorly Graded SAND

▲ B-2, 18'-20' Gray Poorly Graded SAND w/Silt

■ B-3, 18'-20' Gray Poorly Graded SAND

Remarks:

ATLANTIC GEOTECHNICAL SERVICES, INC.

Project No.: RC01-196

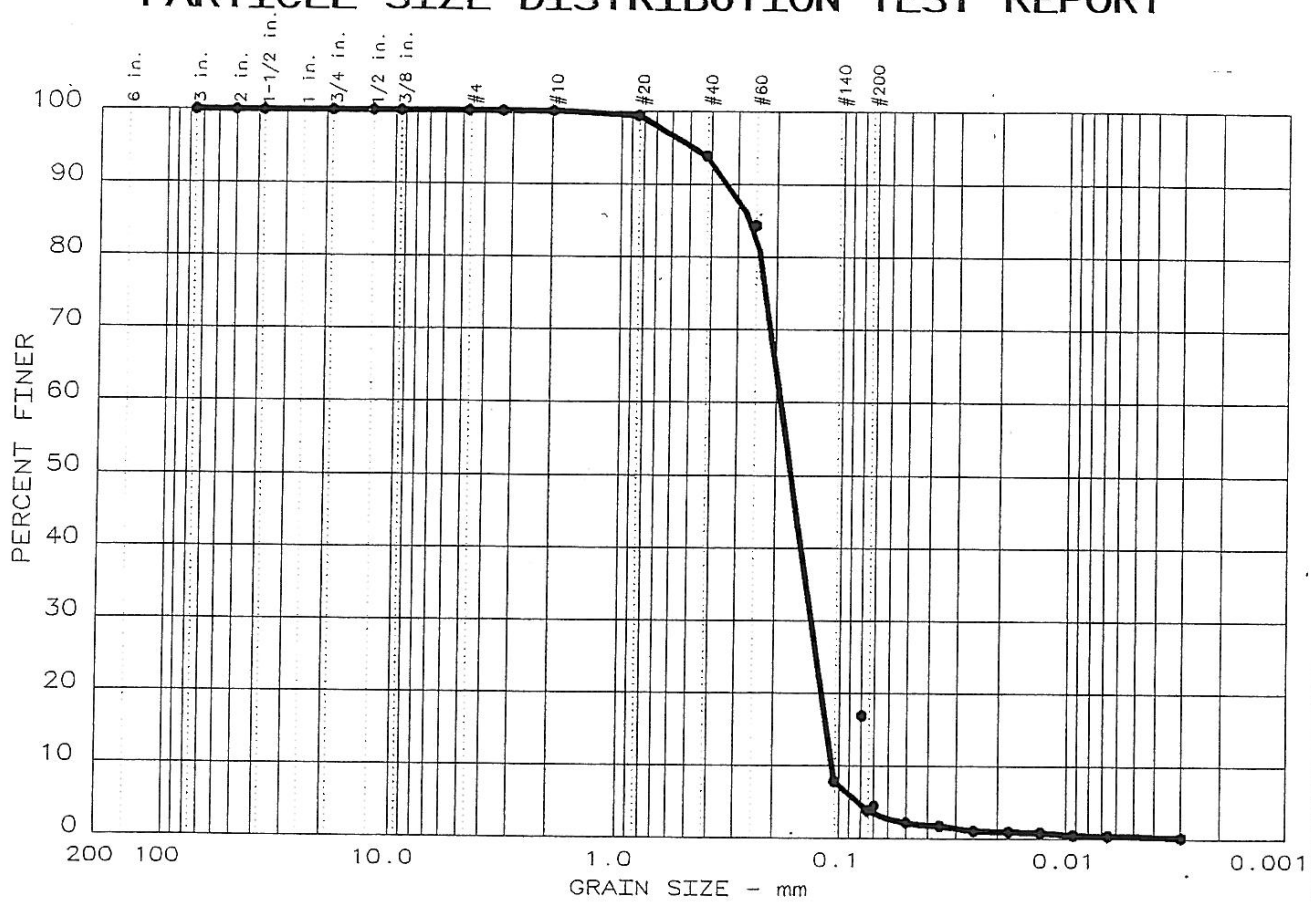
Project: URS - CHESAPEAKE GOLF

Date: 8/06/01

Fig. No.:_____

20147

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	1	0.0	0.0	96.2	3.4	0.4	SP		NP

SIEVE inches size	PERCENT FINER ●		
3	100.0		
2	100.0		
1.5	100.0		
0.75	100.0		
0.5	100.0		
0.375	100.0		
	GRAIN SIZE		
D_{60}	0.190		
D_{30}			
D_{10}	0.108		
	COEFFICIENTS		
C_c	0.90		
C_u	1.8		

SIEVE number size	PERCENT FINER ●		
4	100.0		
6	100.0		
10	100.0		
20	99.4		
40	93.9		
60	84.4		
140	7.8		
200	3.8		

Sample information:
● B-1, 20'-22'
Gray Poorly Graded
SAND

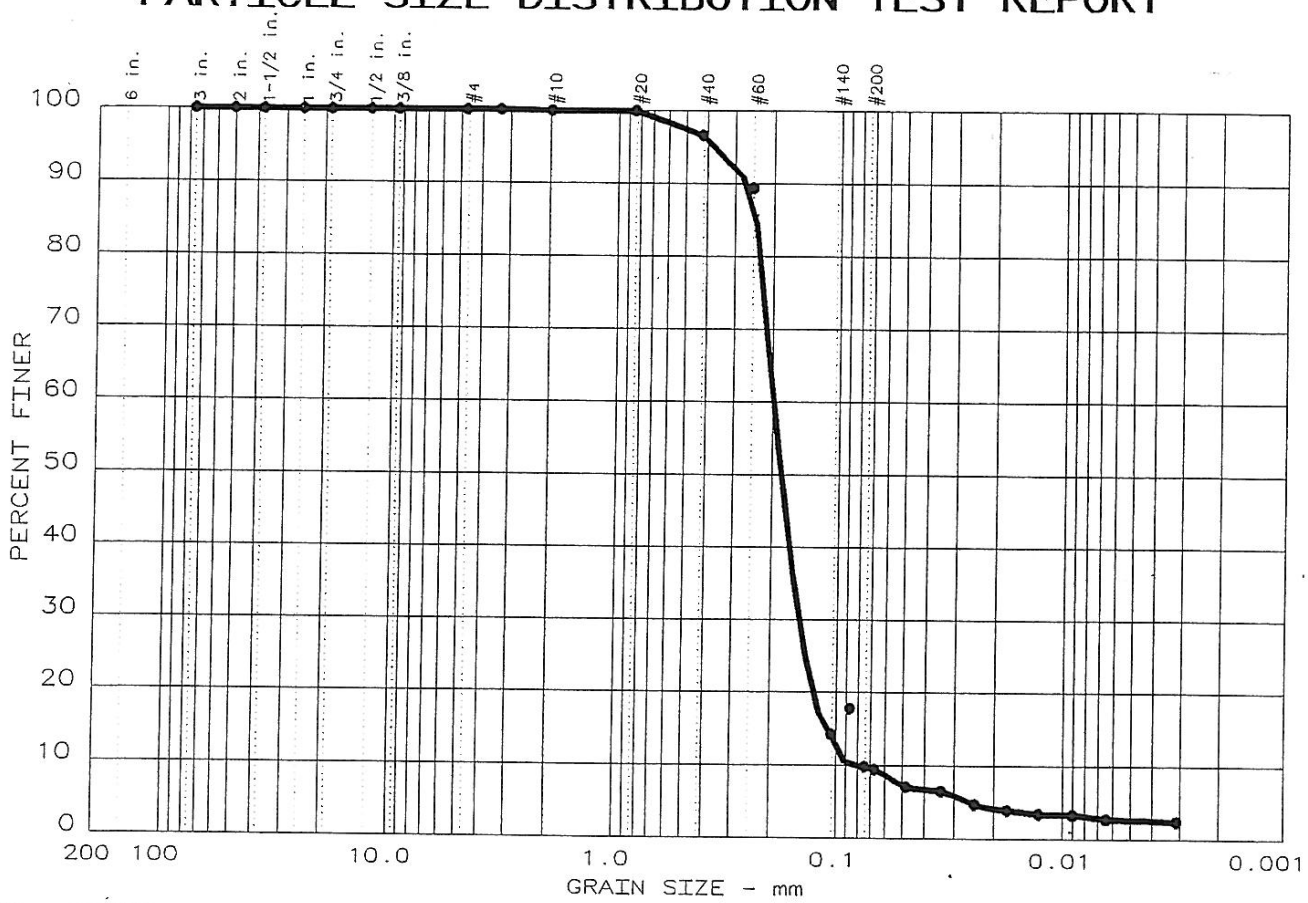
Remarks:

ATLANTIC GEOTECHNICAL SERVICES, INC.

Project No.: RC01-196
Project: URS - CHESAPEAKE GOLF
Date: 8/06/01 Fig. No.:_____

20148

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	2	0.0	0.0	90.1	7.3	2.6	SP-SM		NP

SIEVE inches size	PERCENT FINER ●		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
0.75	100.0		
0.5	100.0		
0.375	100.0		
	GRAIN SIZE		
D_{60}	0.197		
D_{30}			
D_{10}	0.0838		
	COEFFICIENTS		
C_c	1.32		
C_u	2.4		

SIEVE number size	PERCENT FINER ●		
4	100.0		
6	100.0		
10	99.9		
20	99.9		
40	96.6		
60	89.4		
140	14.3		
200	9.9		

Sample information:
● B-2, 18'-20'
Gray Poorly Graded
SAND w/Silt

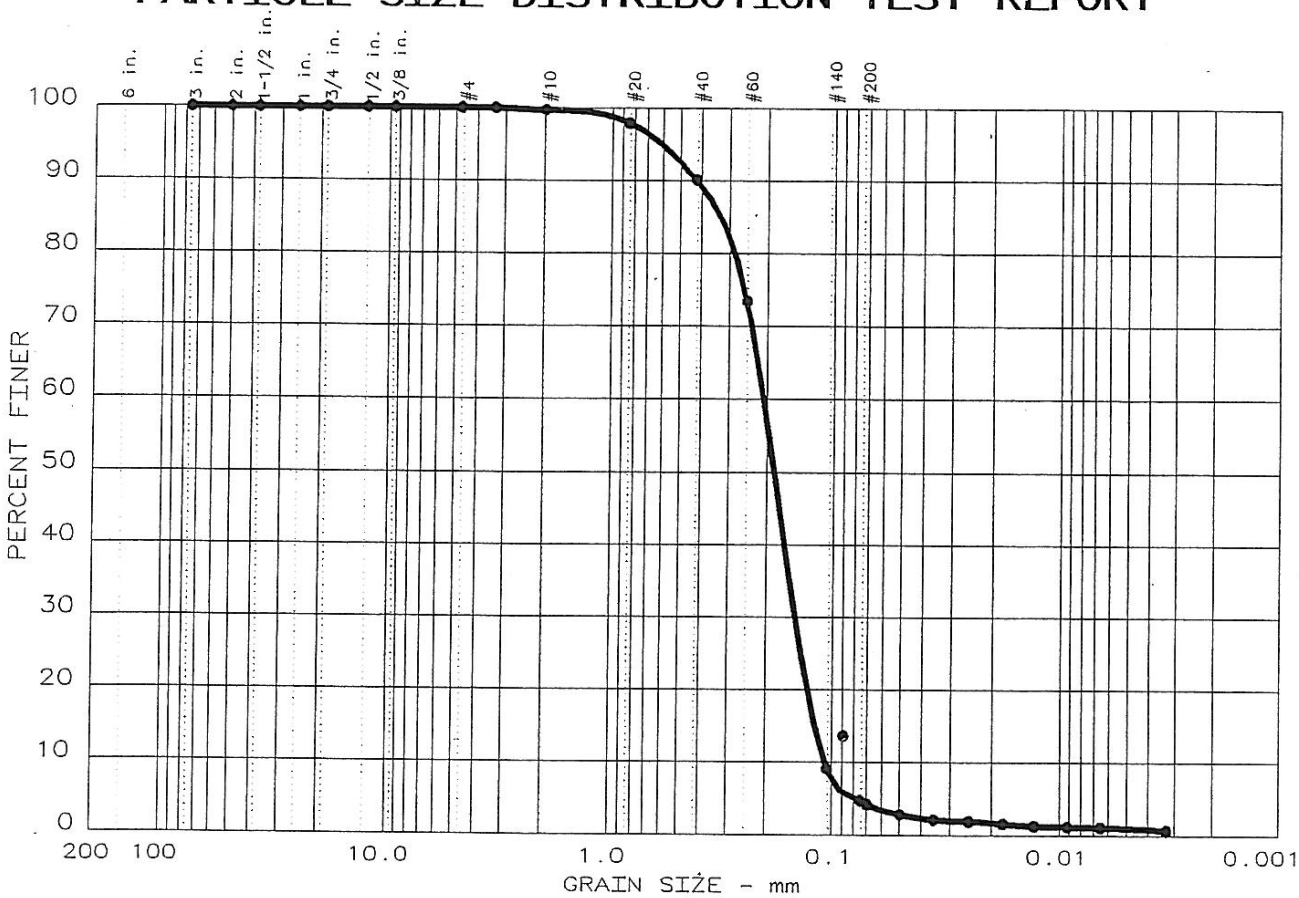
Remarks:

ATLANTIC GEOTECHNICAL SERVICES, INC.

Project No.: RC01-196
Project: URS - CHESAPEAKE GOLF
Date: 8/06/01
Fig. No.:_____

20149

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	3	0.0	0.0	95.3	3.8	0.9	SP		NP

SIEVE inches size	PERCENT FINER ●		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
0.75	100.0		
0.5	100.0		
0.375	100.0		
	GRAIN SIZE		
D_{60}	0.208		
D_{30}			
D_{10}	0.108		
	COEFFICIENTS		
C_c	0.97		
C_u	1.9		

SIEVE number size	PERCENT FINER ●		
4	100.0		
6	100.0		
10	99.7		
20	97.9		
40	90.1		
60	73.4		
140	9.1		
200	4.7		

Sample information:

● B-3, 18'-20'
Gray Poorly Graded
SAND

Remarks:

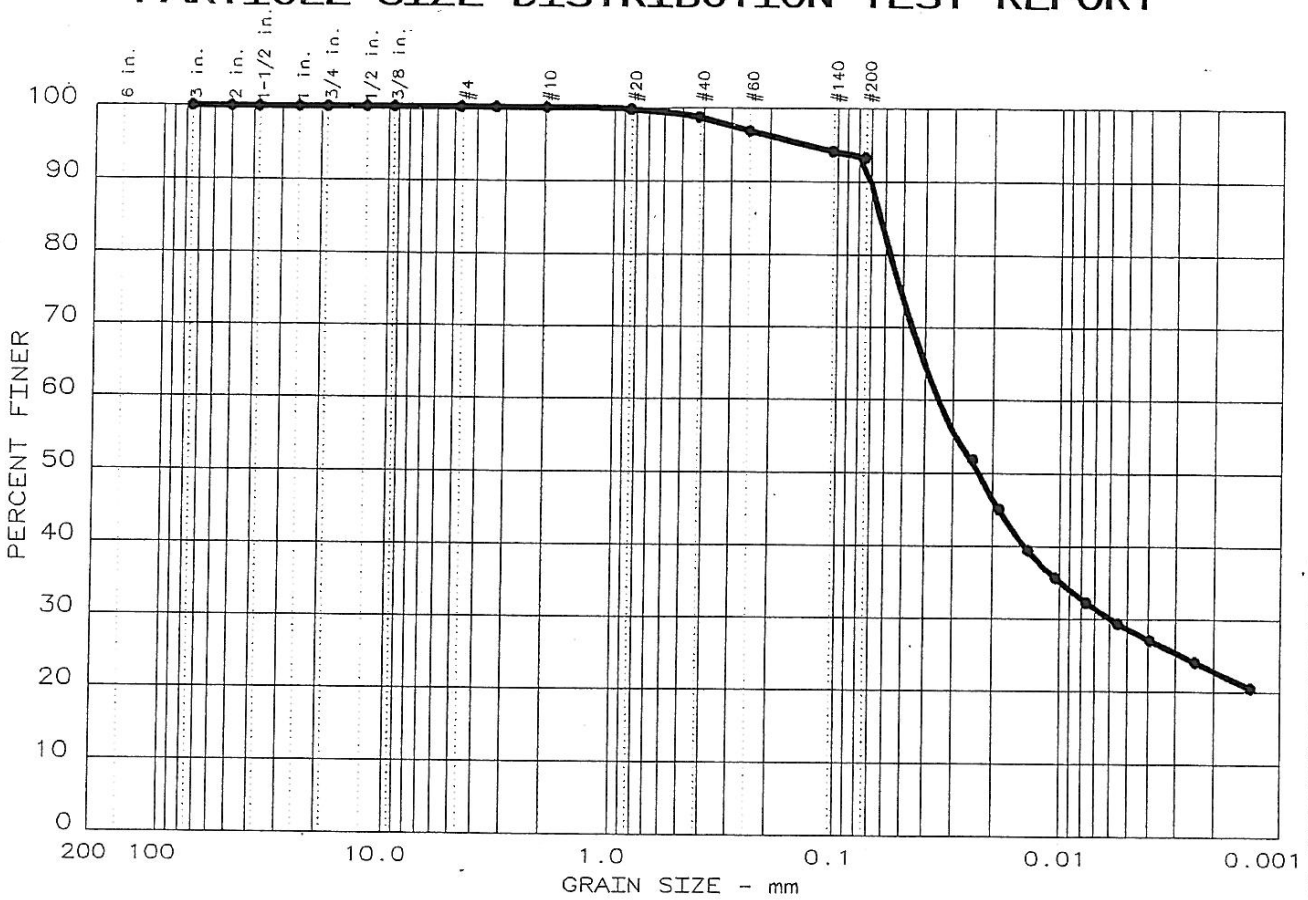
ATLANTIC GEOTECHNICAL SERVICES, INC.

Project No.: RC01-196
Project: URS - CHESAPEAKE GOLF

Date: 8/06/01 Fig. No.:_____

20150

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	4	0.0	0.0	6.7	64.7	28.6	CL	40	20

SIEVE inches size	PERCENT FINER ●		
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
0.75	100.0		
0.5	100.0		
0.375	100.0		
	GRAIN SIZE		
D_{60}			
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
4	100.0		
6	100.0		
10	100.0		
20	99.8		
40	98.7		
60	96.9		
140	94.1		
200	93.3		

Sample information:

● B-1B, 0.5'-2.5'
Dark Gray Clayey SILT

Remarks:

ATLANTIC GEOTECHNICAL SERVICES, INC.

Project No.: RC01-196
Project: URS - CHESAPEAKE GOLF

Date: 8/06/01 Fig. No.:_____

20151

SPECIFIC GRAVITY OF SOILS DATA SHEET

(– #4 SIEVE SOIL)

PROJECT NUMBER: 2601-196 BORING NUMBER: B-1

PROJECT NAME: USS - Chesapeake Coke SAMPLE NUMBER:

DATE: 8/12/01 DEPTH: 20' - 22'

DESCRIPTION:

TESTED BY: RB COMPUTED BY: CHECKED BY:

VOL. FLASK NO.: C

DISH NO.:

WT. OF SOIL & DISH, DRY: 257.65 g

WT. OF DISH: 152.59 g

A) WT. OF SOIL: 105.06 g

B) WT. OF VOL. FLASK & WATER (FROM VOL. FLASK CHART) 651.0 g WATER TEMPERATURE: 21

C) WT. OF VOL. FLASK, SOIL & WATER 716.9 g

D) SPECIFIC GRAVITY = $\frac{A}{A+(B-C)}$ = 2.683

E) SPECIFIC GRAVITY (CORRECTED) $G_s = D \times K$ = 2.68

WATER TEMPERATURE DEGREES C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9980
28	0.9983
29	0.9977
30	0.9974

F) SOIL DESCRIPTION: Gray Poorly Graded Sand (SP)

FILE: SPECGRAV

SPECIFIC GRAVITY OF SOILS DATA SHEET

(– #4SIEVE SOIL)

PROJECT NUMBER: RC01-19.6 BORING NUMBER: B-1

PROJECT NAME: [illegible] SAMPLE NUMBER:

DATE: DEPTH: 20 – 22

DESCRIPTION:

TESTED BY: COMPUTED BY: CHECKED BY:

VOL. FLASK NO.: A

DISH NO.:

WT. OF SOIL & DISH, DRY: 289.55 g

WT. OF DISH: 152.92 g

A) WT. OF SOIL: 136.63 g

B) WT. OF VOL. FLASK & WATER (FROM VOL. FLASK CHART) 650.0 g WATER TEMPERATURE: 20.8

C) WT. OF VOL. FLASK, SOIL & WATER 737.3 g

D) SPECIFIC GRAVITY = $\frac{A}{A+(B-C)}$ = 2.71

E) SPECIFIC GRAVITY (CORRECTED) $G_s = D \times K$ = 2.71

WATER TEMPERATURE DEGREES C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9980
28	0.9983
29	0.9977
30	0.9974

F) SOIL DESCRIPTION:

FILE: SPECGRAV

SPECIFIC GRAVITY OF SOILS DATA SHEET

(– #4 SIEVE SOIL)

PROJECT NUMBER: R601-196 BORING NUMBER: TB-1B

PROJECT NAME: Chemtronics Site SAMPLE NUMBER:

DATE: DEPTH: 0.5' - 2.5'

DESCRIPTION:

TESTED BY: COMPUTED BY: CHECKED BY:

VOL. FLASK NO.:

DISH NO.: B

WT. OF SOIL & DISH, DRY: 219.39 g

WT. OF DISH: 165.38 g

A) WT. OF SOIL: 54.01 g

B) WT. OF VOL. FLASK & WATER (FROM VOL. FLASK CHART) 663.5 g WATER TEMPERATURE: 20.5

C) WT. OF VOL. FLASK, SOIL & WATER 697.2 g

D) SPECIFIC GRAVITY = $\frac{A}{A+(B-C)}$ = 2.66

E) SPECIFIC GRAVITY (CORRECTED) $G_s = D \times K$ = 2.66

WATER TEMPERATURE DEGREES C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9980
28	0.9983
29	0.9977
30	0.9974

F) SOIL DESCRIPTION: Dark Gray Clay Silt (CL)
LL = 40 PI = 20

FILE: SPECGRAV

20154

SPECIFIC GRAVITY OF SOILS DATA SHEET

(- #4SIEVE SOIL)

PROJECT NUMBER: [illegible]

BORING NUMBER: B-13

PROJECT NAME: Chesapeake Golf

SAMPLE NUMBER:

DATE:

DEPTH: 0.5' - 2.5'

DESCRIPTION:

TESTED BY: COMPUTED BY: CHECKED BY:

VOL. FLASK NO.: A

DISH NO.:

WT. OF SOIL & DISH, DRY: 213.43 g

WT. OF DISH: 152.73 g

A) WT. OF SOIL: 60.7 g

B) WT. OF VOL. FLASK & WATER (FROM VOL. FLASK CHART) 650.9 g

WATER TEMPERATURE: 20.4

C) WT. OF VOL. FLASK, SOIL & WATER 688.20 g

D) SPECIFIC GRAVITY = $\frac{A}{A+(B-C)}$ = 2.66

E) SPECIFIC GRAVITY (CORRECTED) $G_s = D \times K$ = 2.66

WATER TEMPERATURE DEGREES C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9980
28	0.9983
29	0.9977
30	0.9974

F) SOIL DESCRIPTION:

FILE: SPECGRAV

SPECIFIC GRAVITY OF SOILS DATA SHEET

(– #4SIEVE SOIL)

PROJECT NUMBER: [illegible] BORING NUMBER: B-2

PROJECT NAME: [illegible] SAMPLE NUMBER:

DATE: 20/12/01 DEPTH: 18' – 20'

DESCRIPTION:

TESTED BY: ZB COMPUTED BY: CHECKED BY:

VOL. FLASK NO.: A

DISH NO.:

WT. OF SOIL & DISH, DRY: 271.26 g

WT. OF DISH: 152.73 g

A) WT. OF SOIL: 118.53 g

B) WT. OF VOL. FLASK & WATER (FROM VOL. FLASK CHART) 651.2 g WATER TEMPERATURE: 20

C) WT. OF VOL. FLASK, SOIL & WATER 725.5 g

D) SPECIFIC GRAVITY = $\frac{A}{A+(B-C)}$ = 2.680

E) SPECIFIC GRAVITY (CORRECTED) G_s = D x K = 2.680

WATER TEMPERATURE DEGREES C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9980
28	0.9983
29	0.9977
30	0.9974

F) SOIL DESCRIPTION: Gray Poorly Graded Sand w Silt (SP-SM)

FILE: SPECGRAV

20156

SPECIFIC GRAVITY OF SOILS DATA SHEET

(– #4SIEVE SOIL)

PROJECT NUMBER: [illegible] BORING NUMBER: [illegible]

PROJECT NAME: [illegible] SAMPLE NUMBER:

DATE: DEPTH: [illegible] – 20'

DESCRIPTION:

TESTED BY: COMPUTED BY: CHECKED BY:

VOL. FLASK NO.: 3

DISH NO.:

WT. OF SOIL & DISH, DRY: 292.34 g

WT. OF DISH: 166.35 g

A) WT. OF SOIL: 125.99 g

B) WT. OF VOL. FLASK & WATER (FROM VOL. FLASK CHART) 663.5 g WATER TEMPERATURE: 19.0

C) WT. OF VOL. FLASK, SOIL & WATER 743.5 g

D) SPECIFIC GRAVITY = $\frac{A}{A+(B-C)}$ = 2.70

E) SPECIFIC GRAVITY (CORRECTED) G_s = D x K = 2.70

WATER TEMPERATURE DEGREES C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9980
28	0.9983
29	0.9977
30	0.9974

F) SOIL DESCRIPTION:

FILE: SPECGRAV

SPECIFIC GRAVITY OF SOILS DATA SHEET

(– #4 SIEVE SOIL)

PROJECT NUMBER: [illegible] BORING NUMBER: B-3

PROJECT NAME: [illegible] SAMPLE NUMBER:

DATE: DEPTH: [illegible] – 20'

DESCRIPTION:

TESTED BY: [illegible] COMPUTED BY: CHECKED BY:

VOL. FLASK NO.: [illegible]

DISH NO.:

WT. OF SOIL & DISH, DRY: 263.33 g

WT. OF DISH: 152.57 g

A) WT. OF SOIL: 110.76 g

B) WT. OF VOL. FLASK & WATER (FROM VOL. FLASK CHART) 650.9 g WATER TEMPERATURE: 20.3

C) WT. OF VOL. FLASK, SOIL & WATER 720.2 g

D) SPECIFIC GRAVITY = $\frac{A}{A+(B-C)}$ = 2.67

E) SPECIFIC GRAVITY (CORRECTED) $G_s = D \times K$ = 2.67

WATER TEMPERATURE DEGREES C	CORRECTION FACTOR, K
18	1.0004
19	1.0002
20	1.0000
21	0.9998
22	0.9996
23	0.9993
24	0.9991
25	0.9989
26	0.9986
27	0.9980
28	0.9983
29	0.9977
30	0.9974

F) SOIL DESCRIPTION: Gray Fine (Graded) SAND (SP)

FILE: SPECGRAV

20158

ags
10971 Richardson Road
Ashland, Virginia 23005
(804) 550-2203 Phone
(804) 550-2204 Fax

JOB NO. 2001-1916 DATE 8/13/01 SHEET ____ OF ____

PROJECT NAME US 5 - Chesapeake Golf

CALC. BY [illegible] CHECKED BY MON DATE 8-13-01

B-1, 20' - 22'

Approx Sample Length = 15.25 in ⇒ 38.74 cm
Approx Sample Diameter = 2.87 ⇒ 7.29 cm
Area = 6.47 in² ⇒ 41.94 cm²
Vol = 0.0571 ft³ ⇒ 1617.01 cm³

Wt of Sample + Tube = 11.68 lbs
Wt. of Tube = 4.87 lbs
Approx Wt of Sample = 6.81 lbs ⇒ 3089.02 g

Moisture Content (avg) = 23.2
Wet Unit Wt = 119.3 lbs/ft³
Dry Unit Wt = 97.6

$P = \frac{V_v}{V_t}$ where: P = Porosity
V_v = Vol. Voids, cc
$V_v = V_t - V_s$
V_t = total vol, cc
W = total wet wt of sample, grams
A = area, cm²
L = length, cm
V_s = Vol. Solids, cc
$V_s = \frac{W}{GS \times (1 + m/c)}$
GS = Specific Gravity

$V_t = 1617.01$ cm³ ✓

$V_s = \frac{3089.02}{2.68 \times 1.232} = 943.22$ cm³ ✓

$P = \frac{1617.01 - 943.22}{1617.01} = 0.417$ ✓

ags
10971 Richardson Road
Ashland, Virginia 23005
(804) 550-2203 Phone
(804) 550-2204 Fax

JOB NO. RC01-146 DATE 8/12/01 SHEET ____ OF ____

PROJECT NAME UES - Chesapeake Golf

CALC. BY RB CHECKED BY ____ DATE ____

Total Wt - [illegible]

Approx Sample Length = 26.50 in ⇒ 67.31 cm
Approx Sample Diameter = 2.87 in ⇒ 7.29 cm
Area = 41.7123 ⇒ 41.71 cm² ✓
Vol = 0.0992 ft³ ⇒ 2809.52 cm³ ✓

Wt Sample + Tube = 17.61 lbs
Wt Tube = 5.69
Approx Wt of Sample = 12.01 lbs = 5447.74 g ✓

Moisture Content (avg) = 22.1%
Wet Unit Wt = 121.1 lbs/ft³
Dry Unit Wt = 99.2 lbs/ft³

$$P = \frac{V_v}{V_t}$$

$V_t = 2809.52$ cm³ ✓

$$V_s = \frac{5447.74}{2.68 \times 1.221} = 1664.81 \text{ cm}^3 \checkmark$$

$$\text{Porosity} = \frac{2809.52 - 1664.81}{2809.52} = 0.407 \checkmark$$

20160

10971 Richardson Road
Ashland, Virginia 23005
(804) 550-2203 Phone
(804) 550-2204 Fax

JOB NO. [illegible] DATE [illegible] SHEET ____ OF ____

PROJECT NAME [illegible]

CALC. BY ____ CHECKED BY ____ DATE ____

B-3, 18' - 20'

Approx. sample height = 29.4 in ⇒ 74.72 cm ✓
Approx. sample diameter = 2.87 in ⇒ 7.29
Area = [illegible] ⇒ [illegible] cm² ✓
Vol = 0.0245 ft³ ⇒ 2703.50 cm³ ✓

Wt sample + tube = 16.50 lbs
Wt tube = 5.29 lbs
Approx. Wt of sample = 11.21 lbs ✓ ⇒ 5082.86 gms ✓

Moisture Content (ave) = 19.7 % ✓
Wet Unit Wt = 117.4 lbs/ft³
Dry Unit Wt = 98.1 lbs/ft³

V_t = 2703.50 cm³ ✓

$V_s = \frac{5082.86}{2.67 \times 1.00} = 1591.01$ cm³ ✓

Porosity $= \frac{V_v}{V_t} = \frac{2703.50 - 1591.01}{2703.50} = 0.411$ ✓

20161

WATER (MOISTURE) CONTENT/VISUAL CLASSIFICATION
(ASTM D 2216, D 2488)

Project No. [illegible] Project Name: _____

Tested By: _____ Date Tested: _____

Computed By: _____ Checked By: _____

Hole No.	Sample No.	Depth, Ft.	Tare No.	Tare, Grams	Wet Wt. + Tare	Dry Wt. + Tare	Water Content, %	Soil Description
B-1	[illegible]	20-22	[illegible]	[illegible]	[illegible]	[illegible]	22.7	
	[illegible]		E42	35.14	298.15	250.79	22.0	
	[illegible]		E45	35.15	304.05	257.55	21.9	
B-2		18-20	[illegible]	[illegible]	360.65	305.49	20.6	
			E12	35.64	286.73	240.43	22.6	
			[illegible]	35.94	300.65	250.75	23.2	
B-3		18-20	[illegible]	35.40	309.24	[illegible]	20.1	
			E45	35.18	410.37	349.05	19.5	
			E46	35.03	355.52	303.57	19.4	

Remarks: _____

Water.vis

20162

APPENDIX E

McCallum Subsurface Investigation Report

McCALLUM
TESTING LABORATORIES, INC.
Geotechnical Engineering, Materials Testing & Environmental Services

SUBSURFACE EXPLORATION

PROPOSED ETHERIDGE GREENS GOLF COURSE

CHESAPEAKE, VIRGINIA

MTL PROJECT #01-2004

1808 HAYWARD AVENUE, CHESAPEAKE, VA 23320 ✦ P.O. BOX 13337, CHESAPEAKE, VA 23325-0337
PHONE (757) 420-2520 ✦ FAX (757) 424-2874

20164

McCALLUM
TESTING LABORATORIES, INC.
Geotechnical Engineering, Materials Testing & Environmental Services

April 5, 2001

Hassell and Folkes, P.C.
325 Volvo Parkway
Chesapeake, VA 23320

Attention: **Jack Claud**

Subject: **Subsurface Exploration**
Proposed Etheridge Greens Golf Course
Chesapeake, Virginia
MTL Project 012004

Dear **Mr. Claud:**

McCallum Testing Laboratories, Inc. has completed the requested subsurface exploration services for the above referenced project. A total of 12 soil test borings were drilled extending to depths of 25.5 ft. beneath the existing ground surface. Standard Penetration Tests (SPT's) were performed at 2 ft. intervals in the upper 10 ft. of boring and at 5 ft. intervals below 10 ft. All drilling and sampling were performed in accordance with applicable ASTM Standards. At the completion of drilling, groundwater level measurements were made within the completed bore holes. In addition, temporary monitoring wells were installed at 4 of the 12 boring locations and the stabilized groundwater level was measured in each. All samples obtained from the borings were visually examined and classified by our laboratory personnel according to the Unified Soils Classification System. Please note that the engineering properties of the obtained samples were not evaluated by a Geotechnical Engineer. The detailed results of the field sampling and testing are attached along with a Test Boring Location Plan.

Should you have any questions concerning this matter, please contact this office at your earliest convenience.

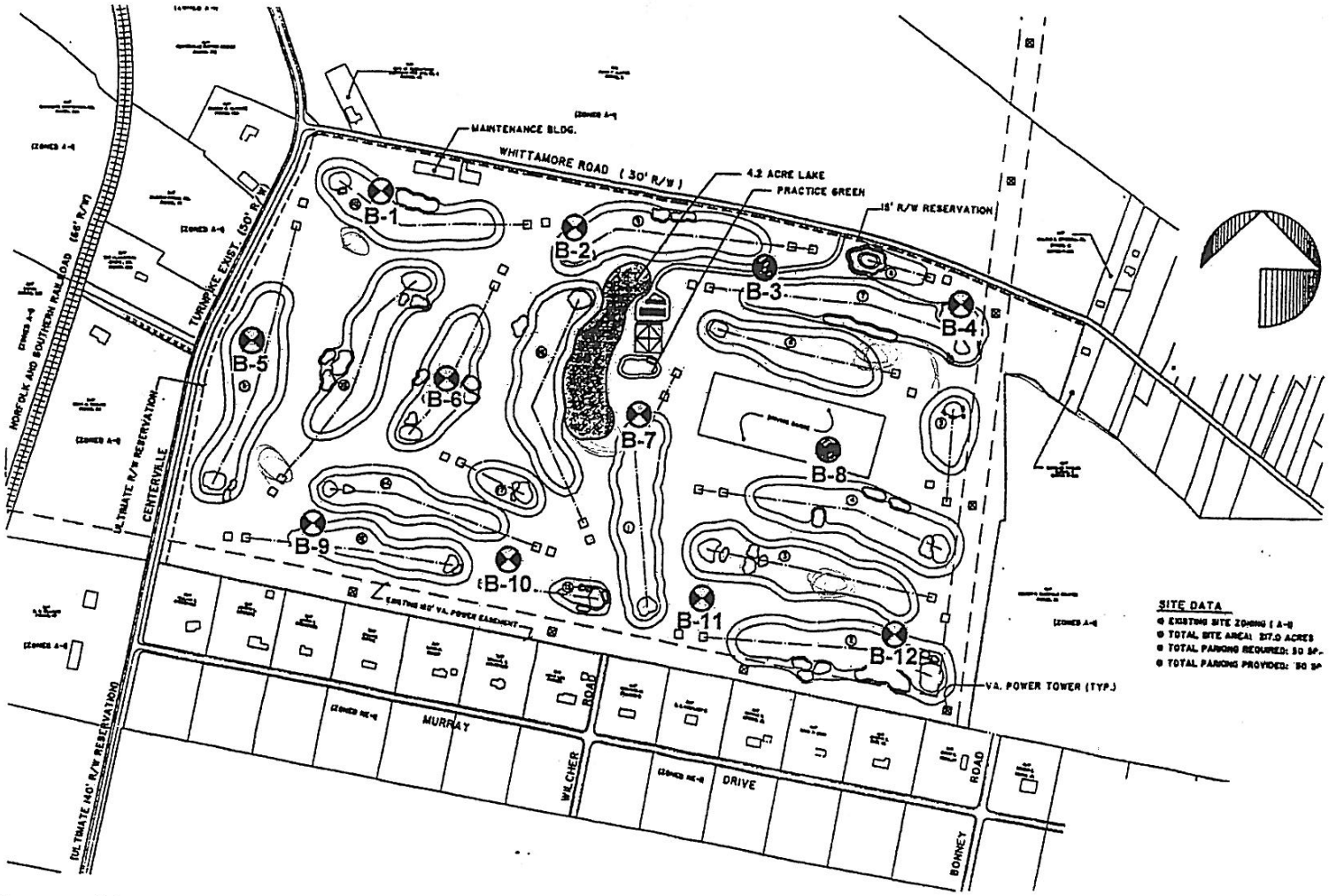
Very truly yours,

McCALLUM TESTING LABORATORIES, INC.

David P. Rediger

David P. Rediger, E.I.T.
Laboratory Manager

1808 HAYWARD AVENUE, CHESAPEAKE, VA 23320 ✦ P.O. BOX 13337, CHESAPEAKE, VA 23325-0337



Ref: Original plan provided by Hassell & Folkes, P.C.

McCALLUM TESTING LABORATORIES, INC. 1808 Hayward Avenue Chesapeake, Virginia 23325-0337			
Scale: ----	Approved By: David P. Rediger, E.I.T.	Date: 4/5/01	
Project:	Proposed Etheridge Greens Golf Course Chesapeake, Virginia		
Drawing Title:	Test Boring Location Plan	Drawing Number: 1-01-2004	

20166

McCALLUM

TESTING LABORATORIES, INC.

CHESAPEAKE, VIRGINIA

Unified Soil Classification System
ASTM Designation D 2487

Coarse Grained Soils (More than 50% of material retained on the No. 200 Sieve)	Gravels (more than 50% retained on the No. 4 Sieve)	GW	Well graded gravels, gravel–sand mixtures, little or no fines
		GP	Poorly graded gravels, gravel–sand mixtures, little or no fines
		GM	Silty gravels, gravel–sand–silt mixtures
		GC	Clayey gravels, gravel–sand–clay mixtures
	Sands (more than 50% passing the No. 4 Sieve)	SW	Well graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
		SM	Silty sands, sand–silt mixtures
		SC	Clayey sands, sand–clay mixtures
Fine Grained Soils (More than 50% of material passes the No. 200 Sieve)	Silts & Clays (LL less than 50)	ML	Inorganic silts, very fine sands, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy
		OL	Organic silts and organic silty clays of low plasticity
	Silts & Clays (LL greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, plastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity
	Highly Organic Soil	PEAT	Peat and other highly organic soils

Standard Penetration Test (SPT)
Resistance Correlations

Coarse Grained Soils

SPT
vs.
Relative Density

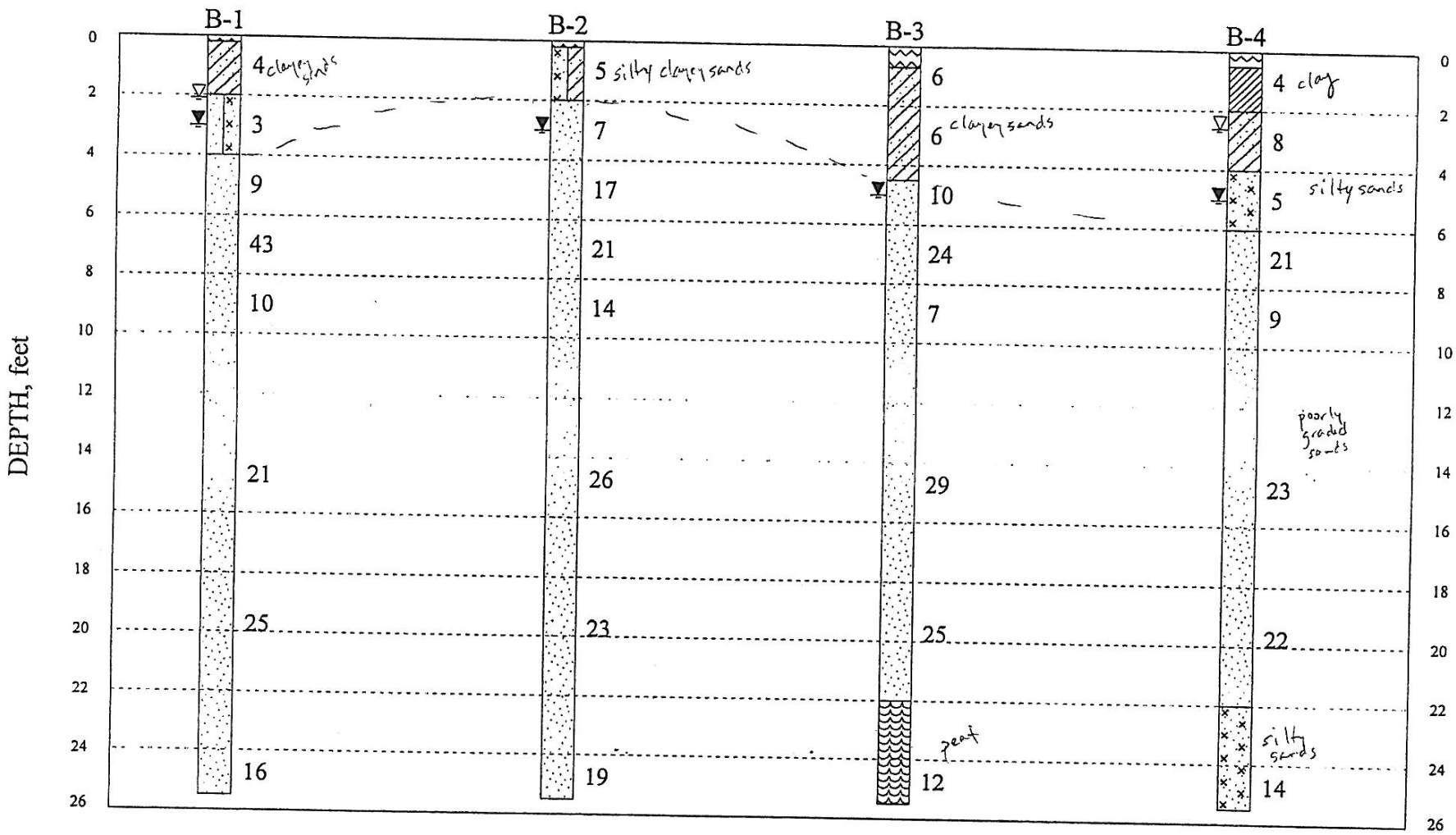
Blows/Ft	Relative Density
0–4	Very Loose
5–10	Loose
11–30	Medium Compact
31–50	Compact
Over 50	Very Compact

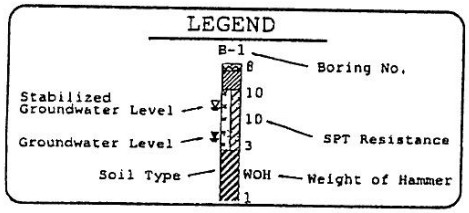
Fine Grained Soils

SPT
vs.
Consistency

Blows/Ft	Consistency
0–2	Very Soft
3–4	Soft
5–8	Medium Stiff
9–15	Stiff
16–30	Very Stiff
31–50	Hard
Over 50	Very Hard

20167





Subsurface Profile

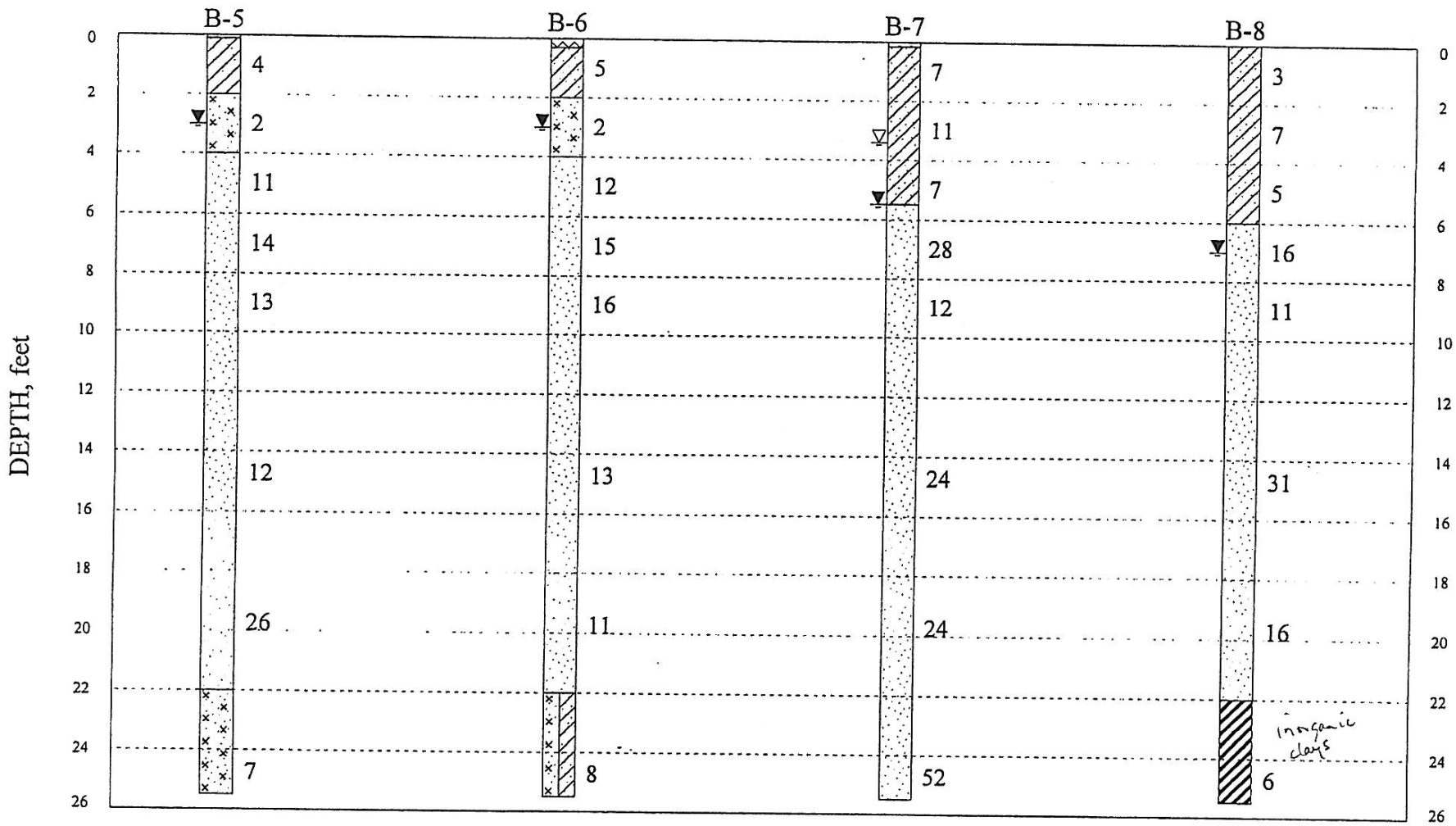
Drawing 2

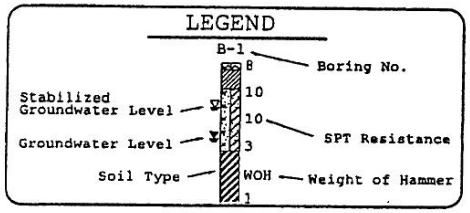
PROJECT Proposed Etheridge Greens Golf Course

PROJECT NO. 01-2004

McCALLUM TESTING LABORATORIES, INC.

20168





Subsurface Profile

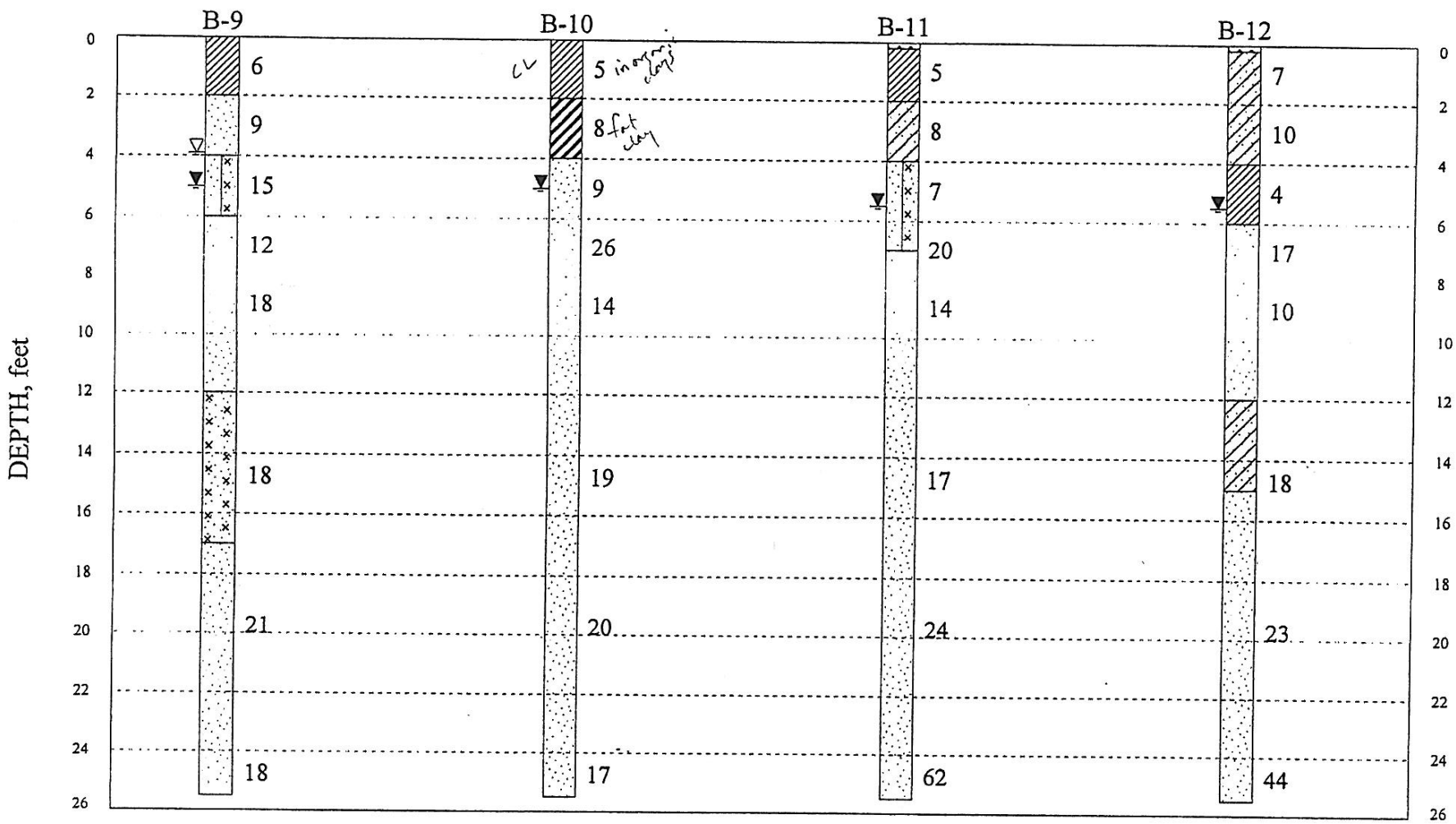
Drawing 3

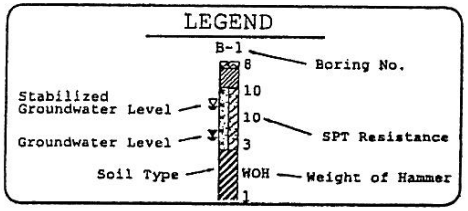
PROJECT Proposed Etheridge Greens Golf Course

PROJECT NO. 01-2004

McCALLUM TESTING LABORATORIES, INC.

20169





Subsurface Profile

Drawing 4

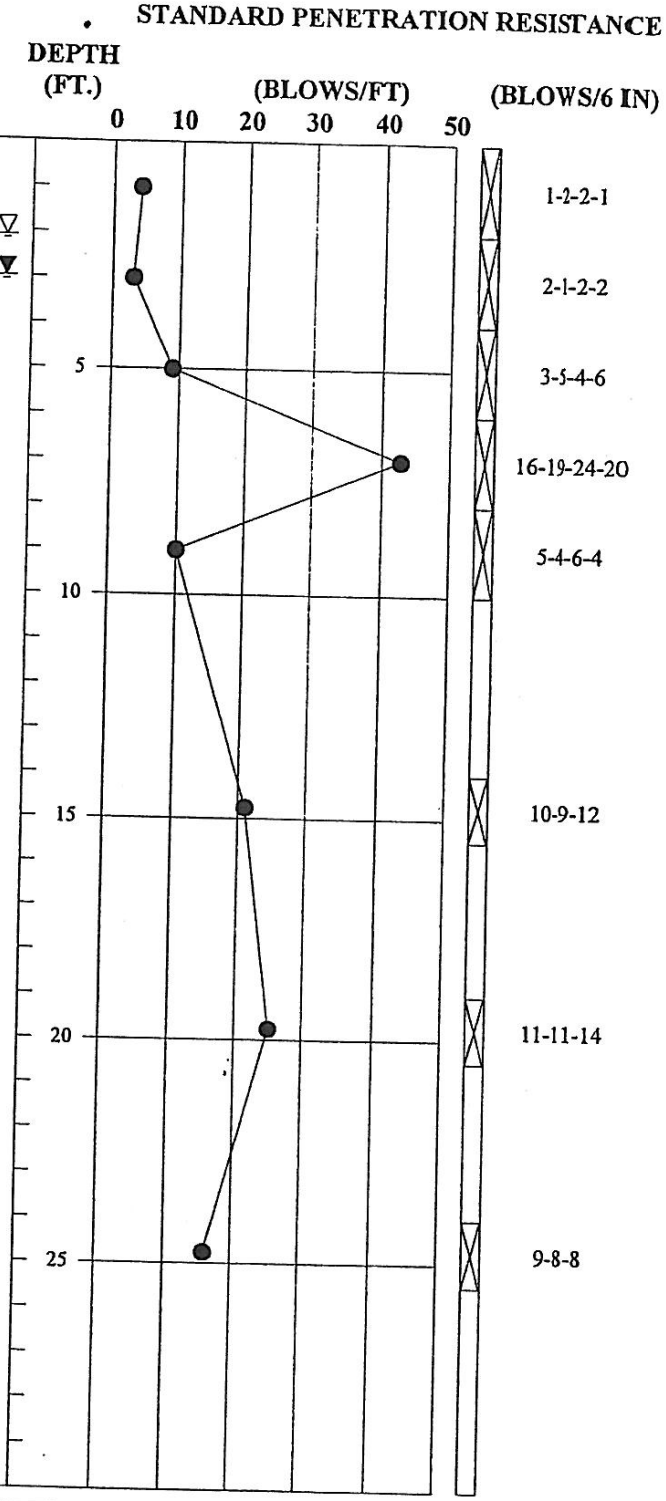
PROJECT Proposed Etheridge Greens Golf Course

PROJECT NO. 01-2004

McCALLUM TESTING LABORATORIES, INC.

20170

DEPTH (FT.)	DESCRIPTION
0.0	
0.2	Topsoil - 2"
	Dark brown silty clayey fine sand, very loose, moist, SC
2.0	
	Brown silty fine sand, wet, very loose, SP-SM
4.0	
	Brown fine sand, wet, loose, SP
	Same - gray, compact
	Same - loose
	Same - medium compact
	Same
25.5	Same
	BORING TERMINATED AT 25.5 FEET



NOTES: *Stabilized groundwater level measured at 2.1 ft. in temporary monitoring well.*

- - - - - - - Gradual Stratum Change
- - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

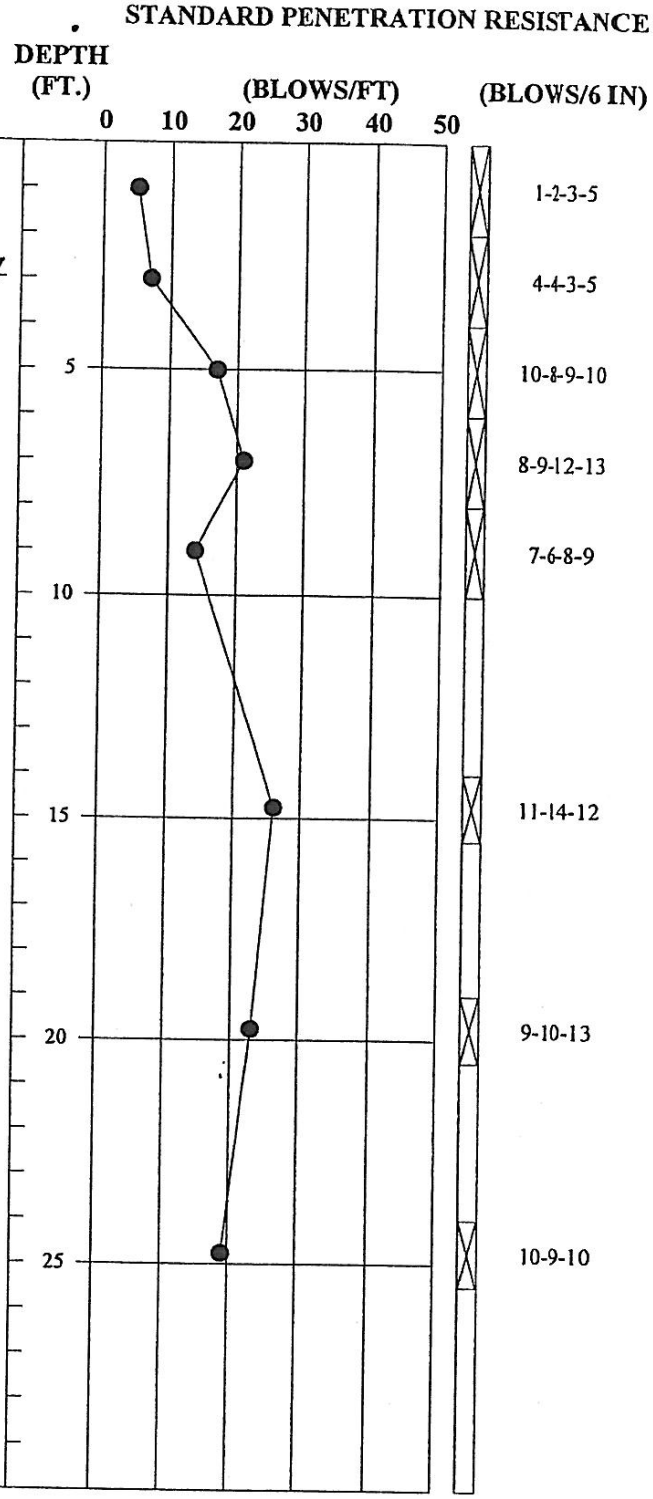
TEST BORING RECORD

BORING NUMBER	B-1
DATE DRILLED	March 16, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20171

DEPTH (FT.)	DESCRIPTION
0.0	
0.2	Topsoil - 2"
	Gray clayey silty fine sand, moist, loose, SM-SC
2.0	
	Gray fine sand, wet, loose, SP
	Same - medium compact
	Same
	Same
	Same
	Same
	Same
25.5	
	BORING TERMINATED AT 25.5 FEET



NOTES:

- - - - - - - Gradual Stratum Change
- - - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
⊠ - Standard Penetration Test
▌ - Undisturbed Sample
▼ - Groundwater Level at Time of Boring
▽ - Stabilized Groundwater Level Reading

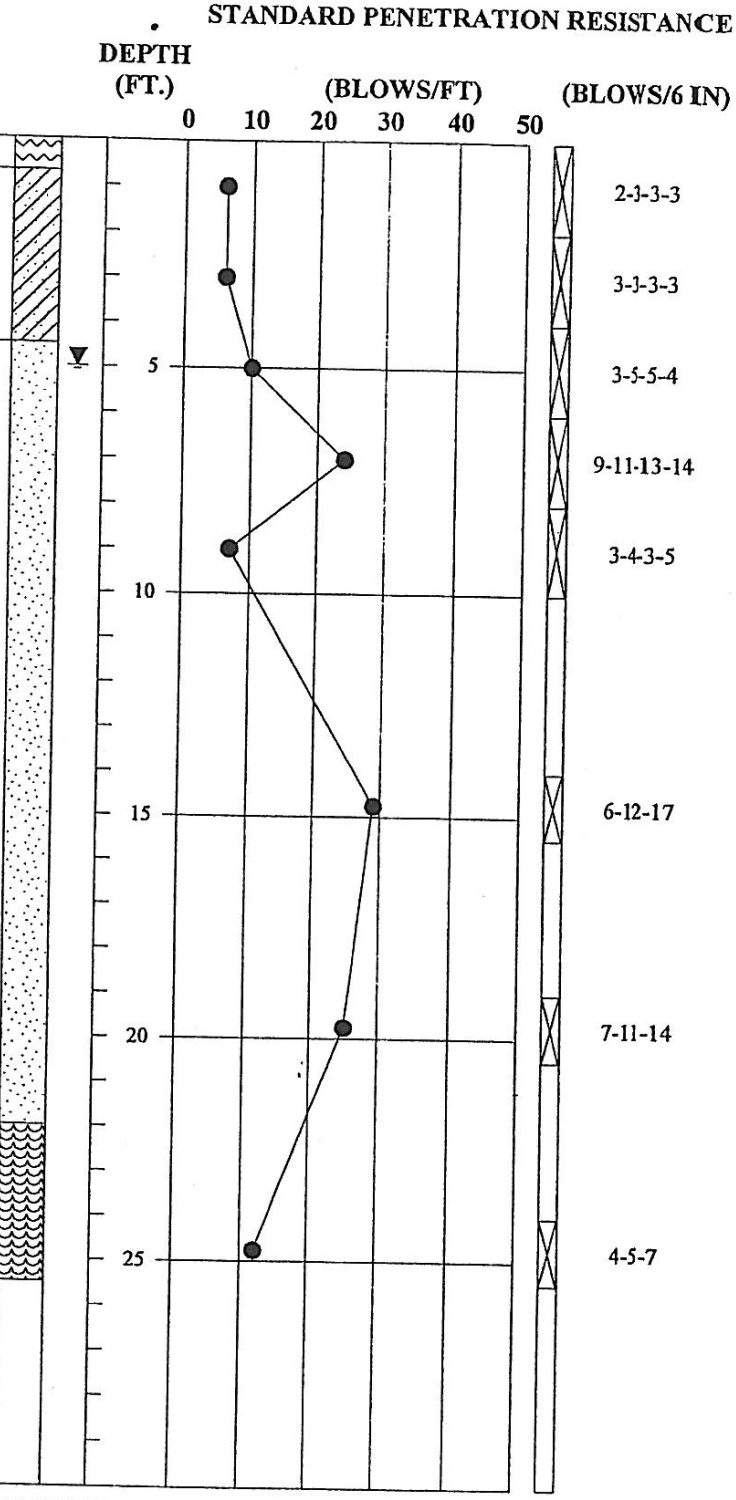
TEST BORING RECORD

BORING NUMBER	B-2
DATE DRILLED	March 16, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20172

DEPTH (FT.)	DESCRIPTION	(BLOWS/6 IN)
0.0		
0.7	Topsoil - 8"	
	Brownish gray silty clayey fine sand, moist, loose, SC	2-3-3-3
	Same - gray mottled brown	3-3-3-3
4.5	Gray fine sand, wet, loose, SP	3-5-5-4
	Same - medium compact	9-11-13-14
	Same - loose	3-4-3-5
	Same - medium compact	6-12-17
	Sand	7-11-14
22.0		
25.5	Dark brown fibrous peat and amorphous peat, wet, stiff, PT	4-5-7
	BORING TERMINATED AT 25.5 FEET	



NOTES:

- - - - - - - Gradual Stratum Change
- - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

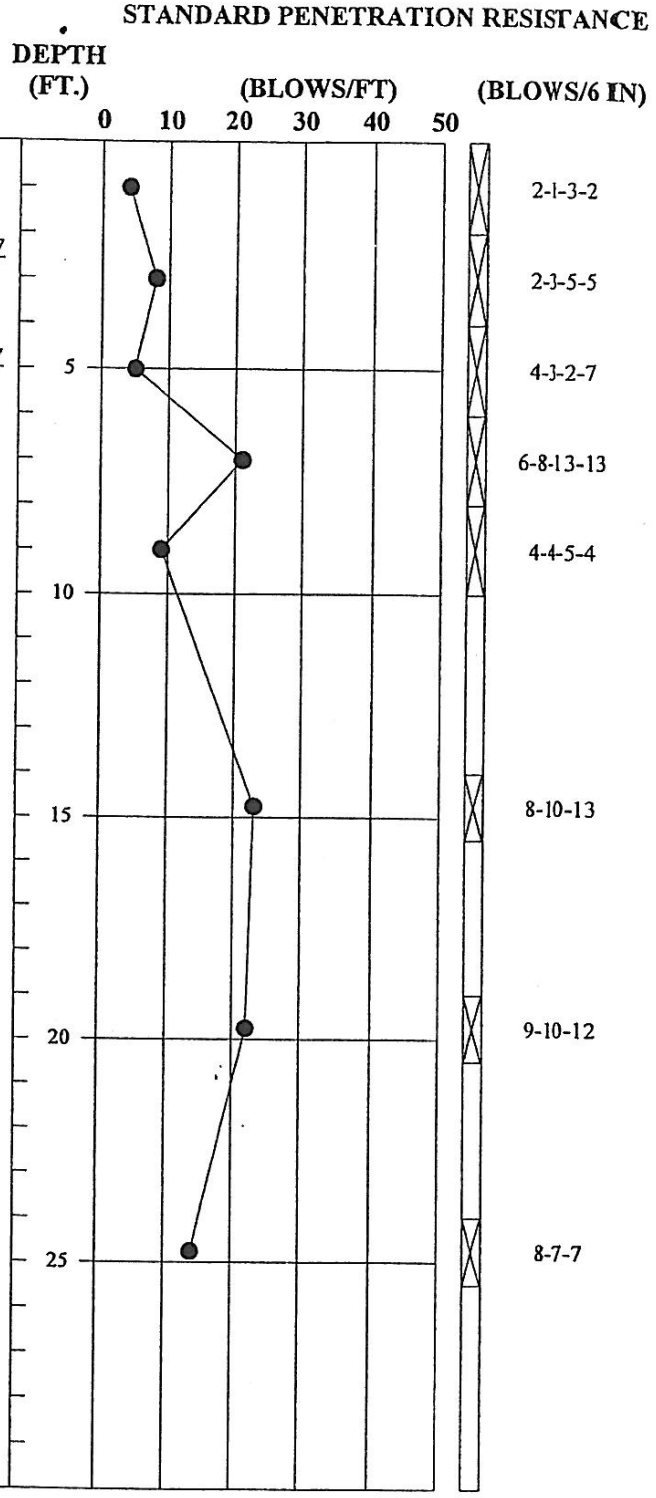
TEST BORING RECORD

BORING NUMBER	B-3
DATE DRILLED	March 16, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20173

DEPTH (FT.)	DESCRIPTION
0.0	
0.5	Topsoil - 6"
	Brown silty fine sandy clay, moist, soft, CL
2.0	
	Gray mottled brown silty clayey fine sand, moist, loose, SC
4.0	
	Gray mottled brown silty fine sand with traces of clay, wet, loose, SM
6.0	
	Gray fine sand, wet, medium compact, SP
	Same - loose
	Same - medium compact
	Same
22.0	
25.5	Gray silty fine sand, wet, medium compact, SM
	BORING TERMINATED AT 25.5 FEET



NOTES: *Stabilized groundwater level measured at 2.6 ft. in temporary monitoring well.*

- - - - - - - Gradual Stratum Change
- - - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

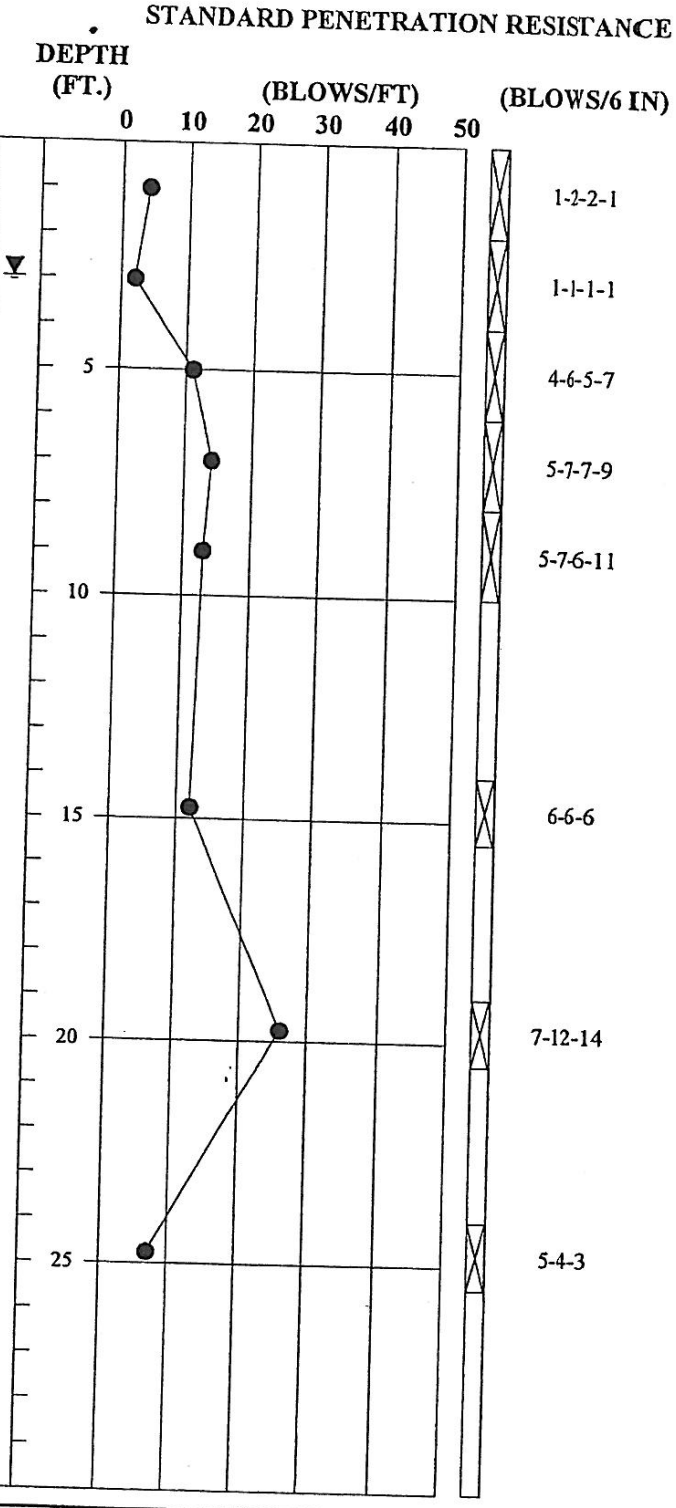
TEST BORING RECORD

BORING NUMBER	B-4
DATE DRILLED	March 16, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20174

DEPTH (FT.)	DESCRIPTION
0.0	
0.1	Topsoil - 1"
	Brown silty clayey fine sand, moist, very loose, SC
2.0	
	Brown silty fine sand with traces of clay, wet, very loose, SM
4.0	
	Brown fine sand, wet, medium compact, SP
	Same
	Same- gray
	Same
	Same
22.0	
25.5	Gray silty fine sand with traces of clay, wet, loose, SM
	BORING TERMINATED AT 25.5 FEET



NOTES:

- - - - - Gradual Stratum Change
- - - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

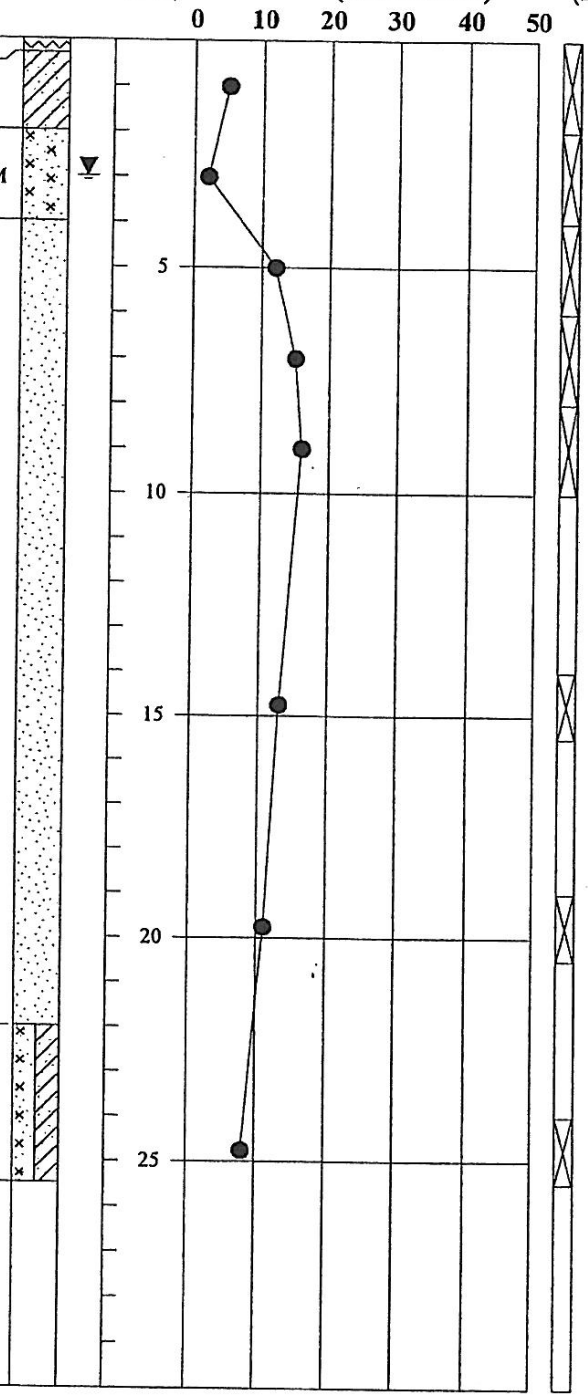
TEST BORING RECORD

BORING NUMBER	B-5
DATE DRILLED	March 16, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20175

DEPTH (FT.)	DESCRIPTION	STANDARD PENETRATION RESISTANCE (BLOWS/6 IN)
0.0		
0.3	Topsoil - 4"	
	Dark brown silty clayey fine sand, moist, loose, SC	2-2-3-2
2.0		
	Brown silty fine sand with traces of clay, wet, very loose, SM	2-1-1-2
4.0		
	Brown fine sand, wet, medium compact, SP	4-4-8-10
	Same - gray	7-7-8-11
	Same	6-8-8-9
	Same	7-6-7
	Same	6-5-6
22.0		
25.5	Gray clayey silty fine sand, wet, loose, SM-SC	4-4-4
	BORING TERMINATED AT 25.5 FEET	



NOTES:

- Gradual Stratum Change
- Approximate Stratum Change
- Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

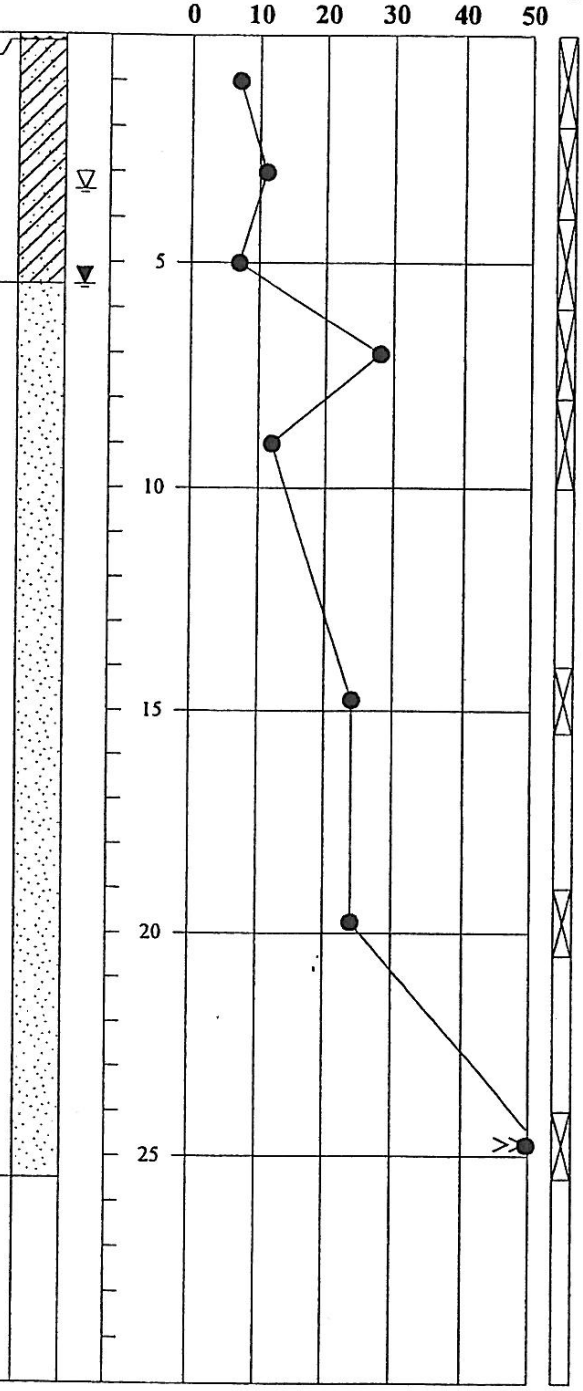
TEST BORING RECORD

BORING NUMBER	B-6
DATE DRILLED	March 16, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20176

DEPTH (FT.)	DESCRIPTION	STANDARD PENETRATION RESISTANCE (BLOWS/6 IN)
0.0		
0.2	Topsoil - 1.5"	
	Brownish gray silty clayey fine sand, moist, loose, SC	2-3-4-4
	Same - gray mottled brown, medium compact	4-6-5-7
5.5		3-3-4-8
	Gray fine sand, wet, loose, SP	
	Same - medium compact	8-14-14-13
	Same	5-5-7-8
	Same	10-12-12
	Same	8-12-12
25.5	Same - very compact	16-27-25
	BORING TERMINATED AT 25.5 FEET	



NOTES: *Stabilized groundwater level measured at 3.4 ft. in temporary monitoring well.*

- Gradual Stratum Change
- Approximate Stratum Change
- ● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

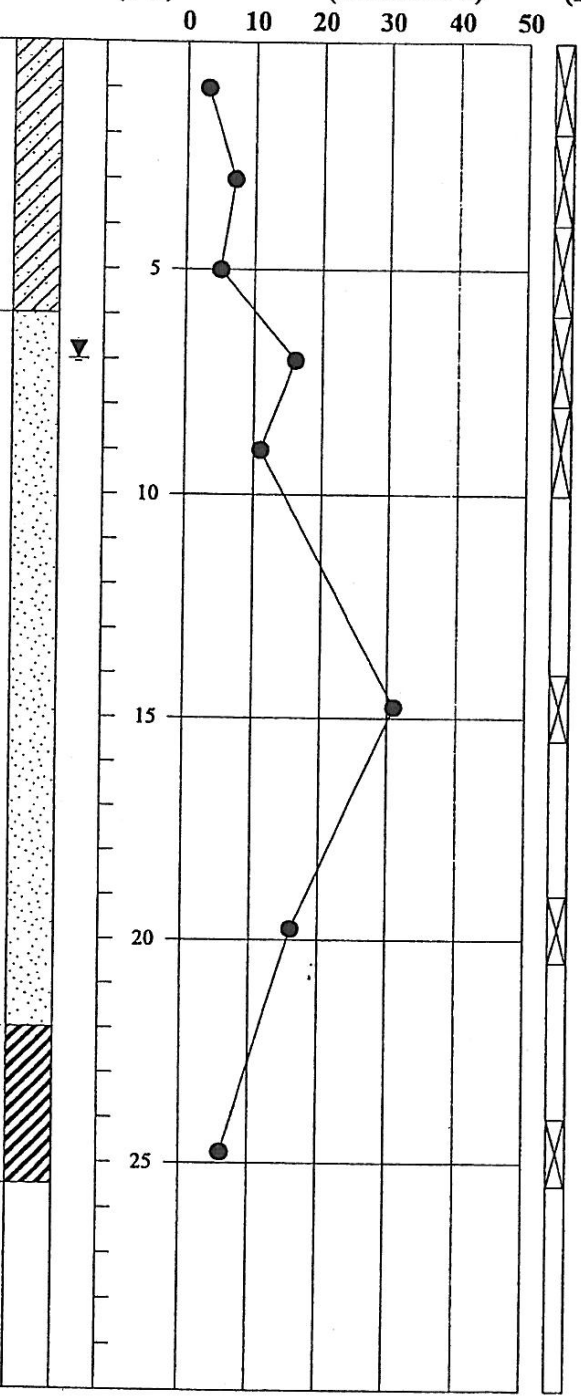
TEST BORING RECORD

BORING NUMBER	B-7
DATE DRILLED	March 16, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20177

DEPTH (FT.)	DESCRIPTION	STANDARD PENETRATION RESISTANCE (BLOWS/6 IN)
0.0	Gray silty clayey fine sand, moist, very loose, SC	3-2-1-1
	Same - loose	3-3-4-7
	Same - gray mottled brown	3-3-2-3
6.0	Brown fine sand, wet, medium compact, SP	6-7-9-9
	Same - gray	4-5-6-7
	Same - compact	12-16-15
	Same - medium compact	8-8-8
22.0		
25.5	Gray fine sandy silty clay with traces of organics, wet, medium stiff, CH	3-3-3
	BORING TERMINATED AT 25.5 FEET	



NOTES:

- - - - - - - Gradual Stratum Change
- - - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

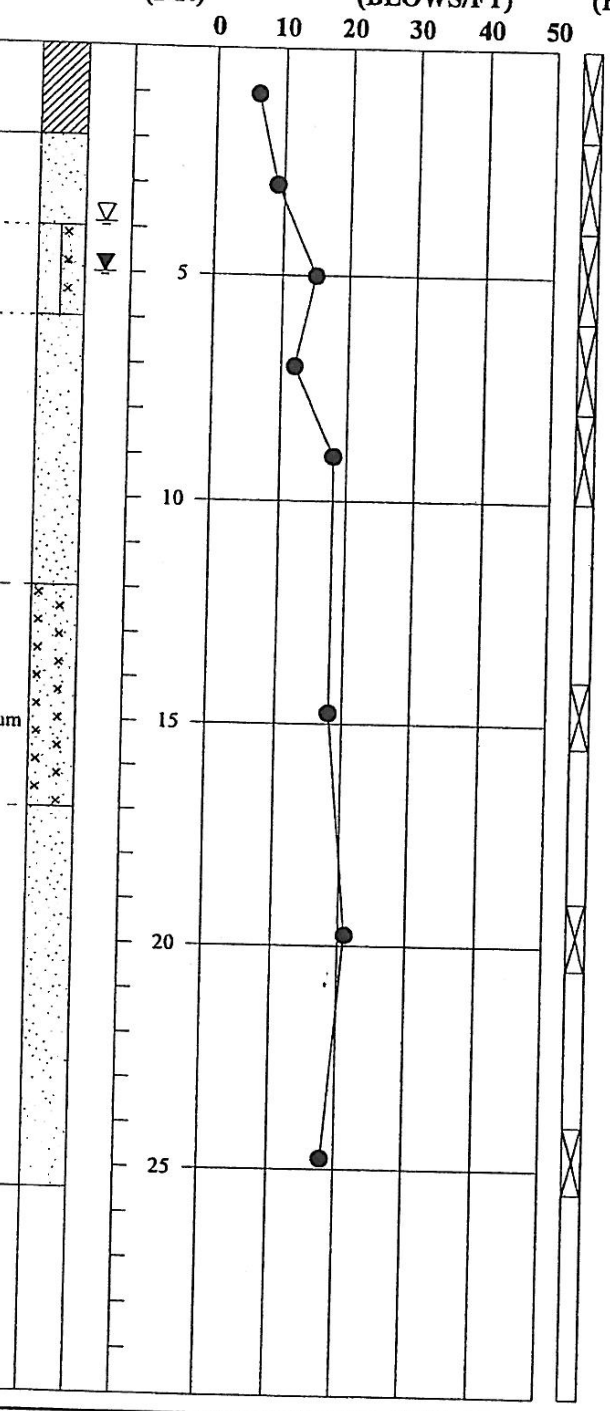
TEST BORING RECORD

BORING NUMBER	B-8
DATE DRILLED	March 14, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20178

DEPTH (FT.)	DESCRIPTION	STANDARD PENETRATION RESISTANCE (BLOWS/6 IN)
0.0		
	Gray silty fine sandy clay, moist, medium stiff, CL	2-2-4-5
2.0		
	Brown fine sand, moist, loose, SP	4-4-5-8
4.0		
	Gray silty fine sand, wet, medium compact, SP-SM	5-7-8-10
6.0		
	Gray fine sand, wet, medium compact, SP	6-7-5-7
	Same	8-8-10-12
12.0		
	Brownish gray silty fine sand with traces of clay, wet, medium compact, SM	10-9-9
17.0		
	Gray fine sand, wet, medium compact, SP	10-11-10
25.5	Same	7-9-9
	BORING TERMINATED AT 25.5 FEET	



NOTES: *Stabilized groundwater level measured at 3.9 ft. in temporary monitoring well.*

- - - - - - - Gradual Stratum Change
- - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

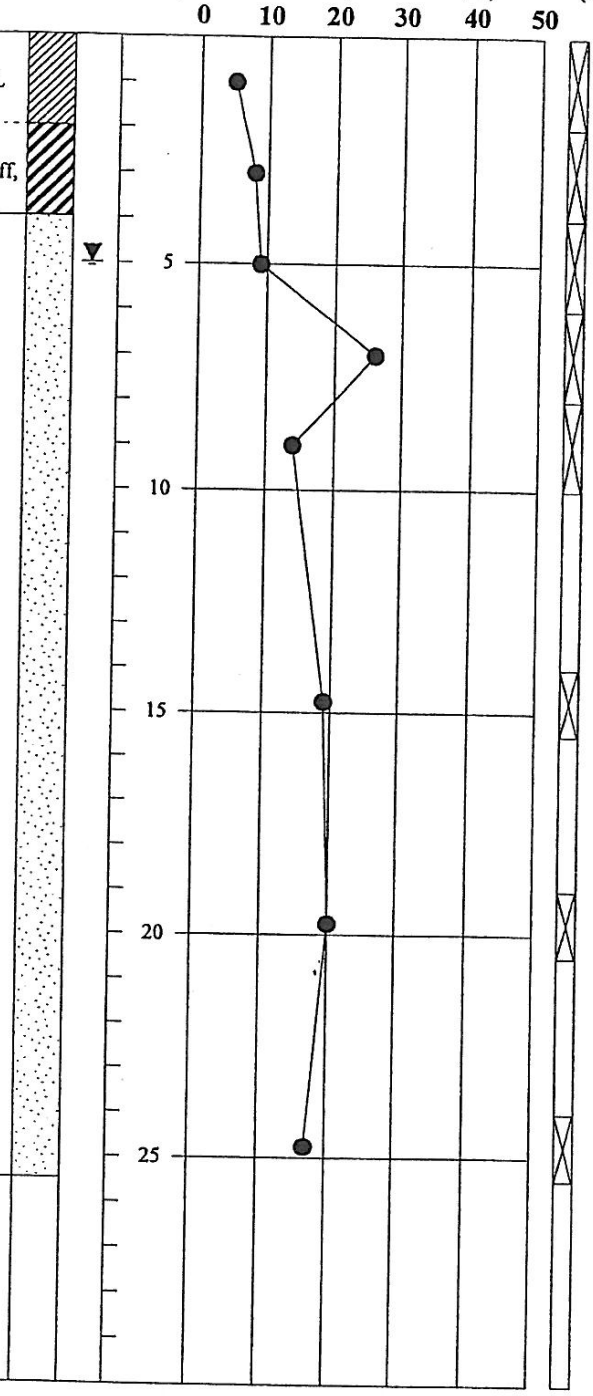
TEST BORING RECORD

BORING NUMBER	B-9
DATE DRILLED	March 14, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20179

DEPTH (FT.)	DESCRIPTION	STANDARD PENETRATION RESISTANCE (BLOWS/6 IN)
0.0		
	Brownish gray silty fine sandy clay, moist, medium stiff, CL	4-3-2-2
2.0		
	Gray mottled brown fine sandy silty clay, moist, medium stiff, CH	4-3-5-6
4.0		
	Gray fine sand, wet, loose, SP	3-3-6-8
	Same - medium compact	8-10-16-12
	Same	7-6-8-9
	Same	2-10-9
	Same	12-10-10
25.5	Same	8-8-9
	BORING TERMINATED AT 25.5 FEET	



NOTES:

- - - - - - - Gradual Stratum Change
- - - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

TEST BORING RECORD

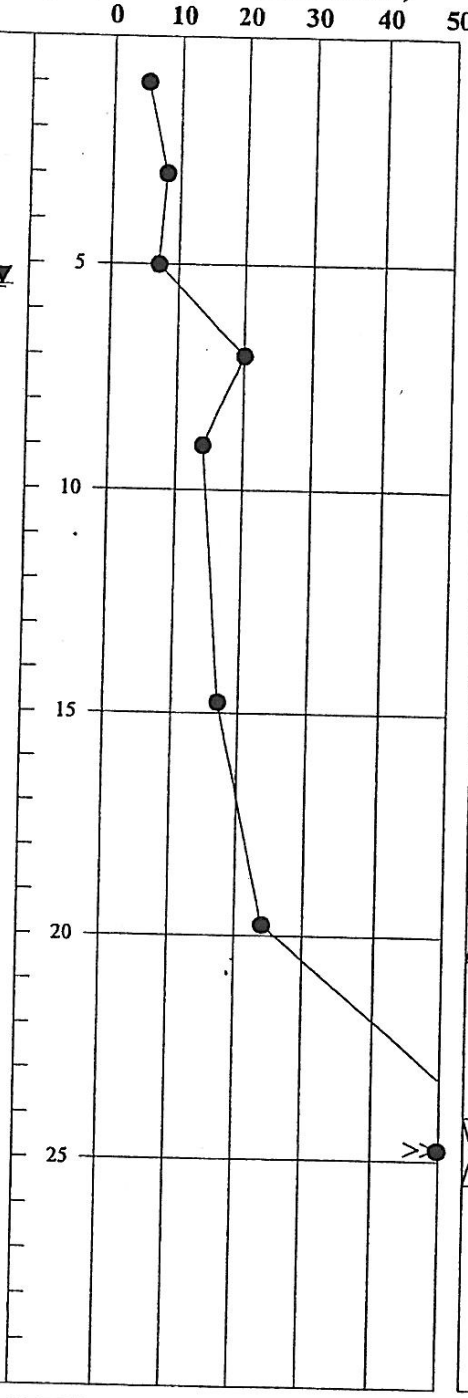
BORING NUMBER	B-10
DATE DRILLED	March 14, 2001
PROJECT NUMBER	01-2004
PROJECT LOCATION	Proposed Etheridge Greens Golf Course Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20180

DEPTH (FT.)	DESCRIPTION	(BLOWS/6 IN)
0.0		
0.2	Topsoil - 2"	
	Gray silty fine sandy clay, moist, medium stiff, CL	2-3-2-2
2.0		
	Gray mottled brown silty clayey fine sand, moist, loose, SC	4-4-4-4
4.0		
	Brownish gray silty fine sand, wet, loose, SP-SM	2-3-4-6
7.0		
	Gray fine sand, wet, medium compact, SP	6-8-12-11
	Same	4-6-8-11
	Same	3-6-11
	Same	10-12-12
25.5	Same - very compact	16-32-30
	BORING TERMINATED AT 25.5 FEET	

STANDARD PENETRATION RESISTANCE



NOTES:

- Gradual Stratum Change
- Approximate Stratum Change
- Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

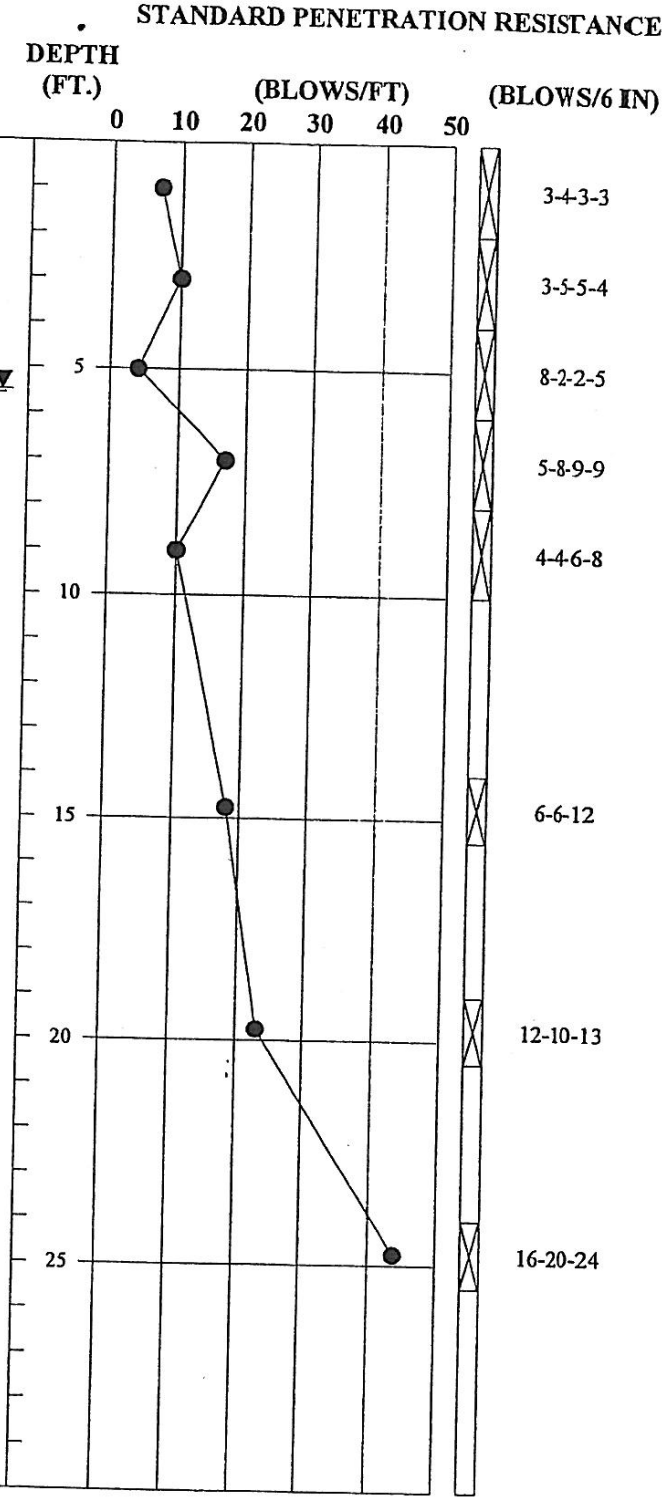
TEST BORING RECORD

BORING NUMBER	B-11
DATE DRILLED	March 14, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20181

DEPTH (FT.)	DESCRIPTION
0.0	
0.2	Topsoil - 2"
	Grayish brown silty clayey fine sand, moist, loose, SC
	Same - gray
4.0	
	Gray mottled brown silty fine sandy clay, wet, soft, CL
6.0	
	Gray fine sand, wet, medium compact, SP
	Same - loose
12.0	
15.0	Grayish brown silty clayey fine sand, wet, medium compact, SC
	Gray fine sand, wet, medium compact, SP
	Same
25.5	Same - compact
	BORING TERMINATED AT 25.5 FEET



NOTES:

- - - - - - - Gradual Stratum Change
- - - - Approximate Stratum Change
● - Penetration Resistance (N - value)
- Standard Penetration Test
- Undisturbed Sample
- Groundwater Level at Time of Boring
- Stabilized Groundwater Level Reading

TEST BORING RECORD

BORING NUMBER	B-12
DATE DRILLED	March 14, 2001
PROJECT NUMBER	01-2004
PROJECT	Proposed Etheridge Greens Golf Course
LOCATION	Chesapeake, Virginia

McCALLUM TESTING LABORATORIES, INC.

20182

APPENDIX F

Analytical Results

FINAL

SEVERN TRENT SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
Fax: 330 497 0772
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 49498-001

CHESAPEAKE GC, CHESAPEAKE, VA

Lot #: A1H020245

MARGIE RAY

URS
5540 Faimouth Street
Suite 201
Richmond, VA 23230

SEVERN TRENT LABORATORIES, INC.

Alesia M. Danford
Project Manager

August 28, 2001

STL North Canton is a part of Severn Trent Laboratories, Inc.

CASE NARRATIVE
A1H020245

The following report contains the analytical results for four water samples submitted to STL North Canton by URS from the Chesapeake GC, Chesapeake, VA Site, project number 49498-001. The samples were received August 2, 2001, according to documented sample acceptance procedures. Margie Ray of URS added additional parameters on August 16, 2001.

STL North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of QC data for these analyses is included at the rear of the report.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

The samples were received at the laboratory at a temperature of 2.5° C.

GENERAL CHEMISTRY

Additional analyses for TDS, Bicarbonate Alkalinity, and Total Alkalinity were requested after the recommended sample holding times had been exceeded.

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

STL North Canton conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program, which is described in detail in QA Policy, QA-003. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. STL North Canton requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. All control analytes indicated by a bold type in the LCS must meet acceptance criteria. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND (non-detected) for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). If the RPD fails for an LCS/LCSD and yet the recoveries are within acceptance criteria, the batch is still acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except under the following circumstances:

- Common organic contaminants may be present at concentrations up to 5 times the reporting limits. Common metals contaminants may be present at concentrations up to 2 times the reporting limit, or the reported blank concentration must be twenty fold less than the concentration reported in the associated environmental samples. (See common laboratory contaminants listed below.)

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride	Phthalate Esters	Copper
Acetone		Iron
2-Butanone		Zinc
		Lead*

- *for analyses run on TJA Trace ICP, ICPMS or GFAA only*

- Organic blanks will be accepted if compounds detected in the blank are present in the associated samples at levels 10 times the blank level. Inorganic blanks will be accepted if elements detected in the blank are present in the associated samples at 20 times the blank level.

QUALITY CONTROL ELEMENTS OF SW-846 METHODS
(Continued)

- Blanks will be accepted if the compounds/elements detected are not present in any of the associated environmental samples.

Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. Due to the potential variability of the matrix of each sample, the MS/MSD results may not have an immediate bearing on any samples except the one spiked; therefore, the associated batch MS/MSD may not reflect the same compounds as the samples contained in the analytical report. When these MS/MSD results fail to meet acceptance criteria, the data is evaluated. If the LCS is within acceptance criteria, the batch is considered acceptable. The acceptance criteria do not apply to samples that are diluted for organics if the native sample amount is 4x the concentration of the spike.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch. However, a Sample Duplicate is less likely to provide usable precision statistics depending on the likelihood of finding concentrations below the standard reporting limit. When the Sample Duplicate result fails to meet acceptance criteria, the data is evaluated.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample is spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

If surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank, and the associated sample(s) are ND, the batch is acceptable. Otherwise, if the LCS, LCSD, or Method Blank surrogate(s) fail to meet recovery criteria, the entire sample batch is reprepped and reanalyzed. If the surrogate recoveries are outside criteria for environmental samples, the samples will be reprepped and reanalyzed unless there is objective evidence of matrix interference or if the sample dilution is greater than the threshold outlined in the associated method SOP.

For the GC/MS BNA methods, the surrogate criterion is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide, PCB, PAH, and Herbicide methods, the surrogate criterion is that one of two surrogate compounds must meet acceptance criteria.

ACCREDITED IN ACCORDANCE WITH nelac

STL North Canton Certifications and Approvals:

Alabama (#41170), California (#2157), Connecticut (#PH-0590), Florida (#E87225), Illinois (#100439), Kansas (#E10336), Kentucky (#90021), Massachusetts (#M-OH048), Maryland (#272), Minnesota (#39-999-348), Missouri (#6090), New Jersey (#74001), New York (#10975), North Dakota (#R-156), Ohio (#6090), OhioVAP (#CL0024), Pennsylvania (#68-340), Rhode Island (#237), South Carolina (#92007001, #92007002, #92007003), Tennessee (#02903), West Virginia (#210), Wisconsin (#999518190),NAVY, ARMY, USDA Soil Permit, ACIL Seal of Excellence – Participating Lab Status Award (#82)

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ANALYTICAL METHODS SUMMARY

A1H020245

PARAMETER	ANALYTICAL METHOD
Alkalinity	MCAWW 310.1
Bicarbonate Alkalinity	MCAWW 310.1
Bromide	MCAWW 300.0A
Chloride	MCAWW 300.0A
Filterable Residue (TDS)	MCAWW 160.1
Fluoride	MCAWW 300.0A
Inductively Coupled Plasma (ICP) Metals	SW846 6010B
Mercury in Liquid Waste (Manual Cold-Vapor)	SW846 7470A
Nitrate as N	MCAWW 300.0A
Sulfate	MCAWW 300.0A
Total phosphorus	MCAWW 365.2
Total Organic Carbon	MCAWW 415.1
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A1H020245

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
EHD49	001	MW-1 CENTER	08/01/01	13:00
EHD5M	002	MW-2 NE	08/01/01	14:15
EHD5N	003	MW-2 NE DUP.	08/01/01	14:20
EHD5P	004	MW-3 SE	08/01/01	15:25

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

URS

Client Sample ID: MW-1 CENTER

DISSOLVED Metals

Lot-Sample #...: A1H020245-001 **Matrix.....:** WG
Date Sampled...: 08/01/01 13:00 **Date Received..:** 08/02/01

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1218124						
Silver	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491A0
		Dilution Factor: 1				
Aluminum	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD491AH
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491A1
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD491AJ
		Dilution Factor: 1				
Beryllium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491AK
		Dilution Factor: 1				
Boron	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD491AL
		Dilution Factor: 1				
Chromium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491A3
		Dilution Factor: 1				
Copper	ND	25.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491AN
		Dilution Factor: 1				
Iron	**10200**	**100**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD491AP**
		Dilution Factor: 1				
Calcium	**92000**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD491AM**
		Dilution Factor: 1				
Cadmium	ND	2.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491A2
		Dilution Factor: 1				
Mercury	ND	0.20	ug/L	SW846 7470A	08/06-08/07/01	EHD491AX
		Dilution Factor: 1				
Potassium	ND	5000	ug/L	SW846 6010B	08/06-08/09/01	EHD491AQ
		Dilution Factor: 1				
Magnesium	**13200**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD491AR**
		Dilution Factor: 1				

(Continued on next page)

URS

Client Sample ID: MW-1 CENTER

DISSOLVED Metals

Lot-Sample #...: A1H020245-001 Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Manganese	339	15.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491AT
		Dilution Factor: 1				
Sodium	32400	5000	ug/L	SW846 6010B	08/06-08/09/01	EHD491AU
		Dilution Factor: 1				
Nickel	ND	40.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491AV
		Dilution Factor: 1				
Lead	ND	3.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491A4
		Dilution Factor: 1				
Selenium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491A5
		Dilution Factor: 1				
Thallium	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491A6
		Dilution Factor: 1				
Vanadium	ND	7.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491A7
		Dilution Factor: 1				
Zinc	ND	20.0	ug/L	SW846 6010B	08/06-08/09/01	EHD491AW
		Dilution Factor: 1				

URS

Client Sample ID: MW-1 CENTER

General Chemistry

Lot-Sample #...: A1H020245-001 Work Order #...: EHD49 Matrix.....: WG
Date Sampled...: 08/01/01 13:00 Date Received..: 08/02/01

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bicarbonate Alkalinity	**130**	**5.0**	**mg/L**	**MCAWW 310.1**	**08/16/01**	**1229494**
		Dilution Factor: 1				
Bromide	ND	500	ug/L	MCAWW 300.0A	08/03/01	1215219
		Dilution Factor: 1				
Chloride	**74300**	**1000**	**ug/L**	**MCAWW 300.0A**	**08/03/01**	**1215220**
		Dilution Factor: 1				
Fluoride	ND	1000	ug/L	MCAWW 300.0A	08/03/01	1215221
		Dilution Factor: 1				
Nitrate	ND	100	ug/L	MCAWW 300.0A	08/03/01	1215223
		Dilution Factor: 1				
Sulfate	**139000**	**1000**	**ug/L**	**MCAWW 300.0A**	**08/03/01**	**1215224**
		Dilution Factor: 1				
Total phosphorus	**210**	**100**	**ug/L**	**MCAWW 365.2**	**08/07/01**	**1219373**
		Dilution Factor: 1				
Total Alkalinity	**130**	**5.0**	**mg/L**	**MCAWW 310.1**	**08/16/01**	**1229495**
		Dilution Factor: 1				
Total Dissolved Solids	**510**	**10**	**mg/L**	**MCAWW 160.1**	**08/16-08/20/01**	**1229172**
		Dilution Factor: 1				
Total Organic Carbon	**3**	**1**	**mg/L**	**MCAWW 415.1**	**08/17/01**	**1232204**
		Dilution Factor: 1				

URS

Client Sample ID: MW-2 NE

DISSOLVED Metals

Lot-Sample #...: A1H020245-002 **Matrix.....:** WG
Date Sampled...: 08/01/01 14:15 **Date Received..:** 08/02/01

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1218124						
Silver	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1A0
		Dilution Factor: 1				
Aluminum	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1AH
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1A1
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1AJ
		Dilution Factor: 1				
Beryllium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1AK
		Dilution Factor: 1				
Boron	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1AL
		Dilution Factor: 1				
Calcium	**37800**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5M1AM**
		Dilution Factor: 1				
Cadmium	ND	2.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1A2
		Dilution Factor: 1				
Chromium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1A3
		Dilution Factor: 1				
Copper	ND	25.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1AN
		Dilution Factor: 1				
Iron	**4860**	**100**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5M1AP**
		Dilution Factor: 1				
Mercury	ND	0.20	ug/L	SW846 7470A	08/06-08/07/01	EHD5M1AX
		Dilution Factor: 1				
Potassium	**8190**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5M1AQ**
		Dilution Factor: 1				
Magnesium	**18700**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5M1AR**
		Dilution Factor: 1				

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URS

Client Sample ID: MW-2 NE

DISSOLVED Metals

Lot-Sample #...: A1H020245-002 Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Manganese	**237**	**15.0**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5M1AT**
		Dilution Factor: 1				
Sodium	**34000**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5M1AU**
		Dilution Factor: 1				
Nickel	ND	40.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1AV
		Dilution Factor: 1				
Lead	ND	3.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1A4
		Dilution Factor: 1				
Selenium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1A5
		Dilution Factor: 1				
Thallium	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1A6
		Dilution Factor: 1				
Vanadium	ND	7.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1A7
		Dilution Factor: 1				
Zinc	ND	20.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5M1AW
		Dilution Factor: 1				

URS

Client Sample ID: MW-2 NE

General Chemistry

Lot-Sample #...: A1H020245-002 Work Order #...: EHD5M Matrix.....: WG
Date Sampled...: 08/01/01 14:15 Date Received..: 08/02/01

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bicarbonate Alkalinity	75	5.0	mg/L	MCAWW 310.1	08/17/01	1229494
		Dilution Factor: 1				
Bromide	ND	500	ug/L	MCAWW 300.0A	08/03/01	1215219
		Dilution Factor: 1				
Chloride	54000	1000	ug/L	MCAWW 300.0A	08/03/01	1215220
		Dilution Factor: 1				
Fluoride	ND	1000	ug/L	MCAWW 300.0A	08/03/01	1215221
		Dilution Factor: 1				
Nitrate	ND	100	ug/L	MCAWW 300.0A	08/03/01	1215223
		Dilution Factor: 1				
Sulfate	103000	1000	ug/L	MCAWW 300.0A	08/03/01	1215224
		Dilution Factor: 1				
Total phosphorus	170	100	ug/L	MCAWW 365.2	08/07/01	1219373
		Dilution Factor: 1				
Total Alkalinity	75	5.0	mg/L	MCAWW 310.1	08/17/01	1229495
		Dilution Factor: 1				
Total Dissolved Solids	390	10	mg/L	MCAWW 160.1	08/16-08/20/01	1229172
		Dilution Factor: 1				
Total Organic Carbon	2	1	mg/L	MCAWW 415.1	08/17/01	1232204
		Dilution Factor: 1				

URS

Client Sample ID: MW-2 NE DUP.

DISSOLVED Metals

Lot-Sample #...: A1H020245-003 Matrix.....: WG
Date Sampled...: 08/01/01 14:20 Date Received..: 08/02/01

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1218124						
Silver	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1A0
		Dilution Factor: 1				
Aluminum	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AH
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1A1
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AJ
		Dilution Factor: 1				
Beryllium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AK
		Dilution Factor: 1				
Boron	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AL
		Dilution Factor: 1				
Calcium	**38800**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5N1AM**
		Dilution Factor: 1				
Cadmium	ND	2.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1A2
		Dilution Factor: 1				
Chromium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1A3
		Dilution Factor: 1				
Copper	ND	25.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AN
		Dilution Factor: 1				
Iron	**4750**	**100**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5N1AP**
		Dilution Factor: 1				
Mercury	ND	0.20	ug/L	SW846 7470A	08/06-08/07/01	EHD5N1AX
		Dilution Factor: 1				
Potassium	**8340**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5N1AQ**
		Dilution Factor: 1				
Magnesium	**19100**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5N1AR**
		Dilution Factor: 1				

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URS

Client Sample ID: MW-2 NE DUP.

DISSOLVED Metals

Lot-Sample #...: A1H020245-003 Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Manganese	242	15.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AT
		Dilution Factor: 1				
Sodium	34700	5000	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AU
		Dilution Factor: 1				
Nickel	ND	40.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AV
		Dilution Factor: 1				
Lead	ND	3.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1A4
		Dilution Factor: 1				
Selenium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1A5
		Dilution Factor: 1				
Thallium	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1A6
		Dilution Factor: 1				
Vanadium	ND	7.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1A7
		Dilution Factor: 1				
Zinc	ND	20.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5N1AW
		Dilution Factor: 1				

URS

Client Sample ID: MW-2 NE DUP.

General Chemistry

Lot-Sample #...: A1H020245-003 Work Order #...: EHD5N Matrix.....: WG
Date Sampled...: 08/01/01 14:20 Date Received..: 08/02/01

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bicarbonate Alkalinity	73	5.0	mg/L	MCAWW 310.1	08/24/01	1239436
		Dilution Factor: 1				
Bromide	ND	500	ug/L	MCAWW 300.0A	08/03/01	1215219
		Dilution Factor: 1				
Chloride	54000	1000	ug/L	MCAWW 300.0A	08/03/01	1215220
		Dilution Factor: 1				
Fluoride	ND	1000	ug/L	MCAWW 300.0A	08/03/01	1215221
		Dilution Factor: 1				
Nitrate	ND	100	ug/L	MCAWW 300.0A	08/03/01	1215223
		Dilution Factor: 1				
Sulfate	103000	1000	ug/L	MCAWW 300.0A	08/03/01	1215224
		Dilution Factor: 1				
Total phosphorus	190	100	ug/L	MCAWW 365.2	08/07/01	1219373
		Dilution Factor: 1				
Total Alkalinity	73	5.0	mg/L	MCAWW 310.1	08/24/01	1240129
		Dilution Factor: 1				
Total Dissolved Solids	380	10	mg/L	MCAWW 160.1	08/16-08/20/01	1229172
		Dilution Factor: 1				
Total Organic Carbon	2	1	mg/L	MCAWW 415.1	08/17/01	1232204
		Dilution Factor: 1				

URS

Client Sample ID: MW-3 SE

DISSOLVED Metals

Lot-Sample #...: A1H020245-004 **Matrix.....:** WG
Date Sampled...: 08/01/01 15:25 **Date Received..:** 08/02/01

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 1218124						
Silver	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1A0
		Dilution Factor: 1				
Aluminum	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1AH
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1A1
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1AJ
		Dilution Factor: 1				
Beryllium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1AK
		Dilution Factor: 1				
Boron	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1AL
		Dilution Factor: 1				
Calcium	**77300**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5P1AM**
		Dilution Factor: 1				
Cadmium	ND	2.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1A2
		Dilution Factor: 1				
Chromium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1A3
		Dilution Factor: 1				
Copper	ND	25.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1AN
		Dilution Factor: 1				
Iron	**4790**	**100**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5P1AP**
		Dilution Factor: 1				
Mercury	ND	0.20	ug/L	SW846 7470A	08/06-08/07/01	EHD5P1AX
		Dilution Factor: 1				
Potassium	ND	5000	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1AQ
		Dilution Factor: 1				
Magnesium	**15600**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5P1AR**
		Dilution Factor: 1				

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URS

Client Sample ID: MW-3 SE

DISSOLVED Metals

Lot-Sample #...: A1H020245-004 Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Manganese	**160**	**15.0**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5P1AT**
		Dilution Factor: 1				
Sodium	**48200**	**5000**	**ug/L**	**SW846 6010B**	**08/06-08/09/01**	**EHD5P1AU**
		Dilution Factor: 1				
Nickel	ND	40.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1AV
		Dilution Factor: 1				
Lead	ND	3.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1A4
		Dilution Factor: 1				
Selenium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1A5
		Dilution Factor: 1				
Thallium	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1A6
		Dilution Factor: 1				
Vanadium	ND	7.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1A7
		Dilution Factor: 1				
Zinc	ND	20.0	ug/L	SW846 6010B	08/06-08/09/01	EHD5P1AW
		Dilution Factor: 1				

URS

Client Sample ID: MW-3 SE

General Chemistry

Lot-Sample #...: A1H020245-004 Work Order #...: EHD5P Matrix.....: WG
Date Sampled...: 08/01/01 15:25 Date Received..: 08/02/01

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bicarbonate Alkalinity	**160**	**5.0**	**mg/L**	**MCAWW 310.1**	**08/17/01**	**1229494**
		Dilution Factor: 1				
Bromide	ND	500	ug/L	MCAWW 300.0A	08/03/01	1215219
		Dilution Factor: 1				
Chloride	**53300**	**1000**	**ug/L**	**MCAWW 300.0A**	**08/03/01**	**1215220**
		Dilution Factor: 1				
Fluoride	ND	1000	ug/L	MCAWW 300.0A	08/03/01	1215221
		Dilution Factor: 1				
Nitrate	ND	100	ug/L	MCAWW 300.0A	08/03/01	1215223
		Dilution Factor: 1				
Sulfate	**112000**	**1000**	**ug/L**	**MCAWW 300.0A**	**08/03/01**	**1215224**
		Dilution Factor: 1				
Total phosphorus	**390**	**100**	**ug/L**	**MCAWW 365.2**	**08/07/01**	**1219373**
		Dilution Factor: 1				
Total Alkalinity	**160**	**5.0**	**mg/L**	**MCAWW 310.1**	**08/17/01**	**1229495**
		Dilution Factor: 1				
Total Dissolved Solids	**460**	**10**	**mg/L**	**MCAWW 160.1**	**08/16-08/20/01**	**1229172**
		Dilution Factor: 1				
Total Organic Carbon	**6**	**1**	**mg/L**	**MCAWW 415.1**	**08/17/01**	**1232204**
		Dilution Factor: 1				

QUALITY CONTROL SECTION

METHOD BLANK REPORT

DISSOLVED Metals

Client Lot #...: A1H020245 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: A1H060000-124 **Prep Batch #...:** 1218124						
Aluminum	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1CU
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1DC
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1CV
		Dilution Factor: 1				
Beryllium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1CW
		Dilution Factor: 1				
Boron	ND	200	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1CX
		Dilution Factor: 1				
Cadmium	ND	2.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1DD
		Dilution Factor: 1				
Calcium	ND	5000	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C0
		Dilution Factor: 1				
Chromium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1DE
		Dilution Factor: 1				
Copper	ND	25.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C1
		Dilution Factor: 1				
Iron	ND	100	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C2
		Dilution Factor: 1				
Lead	ND	3.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1DF
		Dilution Factor: 1				
Magnesium	ND	5000	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C4
		Dilution Factor: 1				
Manganese	ND	15.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C5
		Dilution Factor: 1				
Mercury	ND	0.20	ug/L	SW846 7470A	08/06-08/07/01	EHHRK1C9
		Dilution Factor: 1				
Nickel	ND	40.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C7
		Dilution Factor: 1				

(Continued on next page)

METHOD BLANK REPORT

DISSOLVED Metals

Client Lot #...: A1H020245 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Potassium	ND	5000	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C3
		Dilution Factor: 1				
Selenium	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1DG
		Dilution Factor: 1				
Silver	ND	5.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1DA
		Dilution Factor: 1				
Sodium	ND	5000	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C6
		Dilution Factor: 1				
Thallium	ND	10.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1DH
		Dilution Factor: 1				
Vanadium	ND	7.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1DJ
		Dilution Factor: 1				
Zinc	ND	20.0	ug/L	SW846 6010B	08/06-08/09/01	EHHRK1C8
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: A1H020245 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bicarbonate Alkalinity		Work Order #: EH7QR1AA		MB Lot-Sample #:	A1H170000-494	
	ND	5.0	mg/L	MCAWW 310.1	08/16/01	1229494
		Dilution Factor: 1				
Bicarbonate Alkalinity		Work Order #: EJMRH1AA		MB Lot-Sample #:	A1H270000-436	
	ND	5.0	mg/L	MCAWW 310.1	08/24/01	1239436
		Dilution Factor: 1				
Bromide		Work Order #: EHF4M1AA		MB Lot-Sample #:	A1H030000-219	
	ND	500	ug/L	MCAWW 300.0A	08/02/01	1215219
		Dilution Factor: 1				
Chloride		Work Order #: EHF3P1AA		MB Lot-Sample #:	A1H030000-220	
	ND	1000	ug/L	MCAWW 300.0A	08/02/01	1215220
		Dilution Factor: 1				
Fluoride		Work Order #: EHF271AA		MB Lot-Sample #:	A1H030000-221	
	ND	1000	ug/L	MCAWW 300.0A	08/02/01	1215221
		Dilution Factor: 1				
Nitrate		Work Order #: EHF4N1AA		MB Lot-Sample #:	A1H030000-223	
	ND	100	ug/L	MCAWW 300.0A	08/02/01	1215223
		Dilution Factor: 1				
Sulfate		Work Order #: EHF4T1AA		MB Lot-Sample #:	A1H030000-224	
	ND	1000	ug/L	MCAWW 300.0A	08/02/01	1215224
		Dilution Factor: 1				
Total phosphorus		Work Order #: EHKRW1AA		MB Lot-Sample #:	A1H070000-373	
	ND	100	ug/L	MCAWW 365.2	08/07/01	1219373
		Dilution Factor: 1				
Total Alkalinity		Work Order #: EH7Q01AA		MB Lot-Sample #:	A1H170000-495	
	ND	5.0	mg/L	MCAWW 310.1	08/16/01	1229495
		Dilution Factor: 1				
Total Alkalinity		Work Order #: EJMRE1AA		MB Lot-Sample #:	A1H280000-129	
	ND	5.0	mg/L	MCAWW 310.1	08/24/01	1240129
		Dilution Factor: 1				
Total Dissolved Solids		Work Order #: EJAX21AA		MB Lot-Sample #:	A1H170000-172	
	ND	10	mg/L	MCAWW 160.1	08/16-08/20/01	1229172
		Dilution Factor: 1				

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METHOD BLANK REPORT

General Chemistry

Client Lot #...: A1H020245 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon		Work Order #: EH8N61AA		MB Lot-Sample #:	A1H200000-204	
	ND	1	mg/L	MCAWW 415.1	08/17/01	1232204
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

DISSOLVED Metals

Client Lot #...: A1H020245

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: A1H060000-124 **Prep Batch #...:** 1218124					
Aluminum	99	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EC
Barium	97	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1ED
Beryllium	99	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EE
Boron	99	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EF
Calcium	99	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EG
Copper	99	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EH
Iron	106	(77 - 127)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EJ
Potassium	105	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EK
Magnesium	102	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EL
Manganese	101	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EM
Sodium	103	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EN
Nickel	98	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EP
Zinc	101	(80 - 120)	SW846 6010B Dilution Factor: 1	08/06-08/09/01	EHHRK1EQ
Mercury	84	(70 - 118)	SW846 7470A Dilution Factor: 1	08/06-08/07/01	EHHRK1ER

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

DISSOLVED Metals

Client Lot #...: A1H020245 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Silver	110	(80 - 120)	SW846 6010B	08/06-08/09/01	EHHRK1ET
		Dilution Factor: 1			
Arsenic	101	(80 - 120)	SW846 6010B	08/06-08/09/01	EHHRK1EU
		Dilution Factor: 1			
Cadmium	99	(80 - 120)	SW846 6010B	08/06-08/09/01	EHHRK1EV
		Dilution Factor: 1			
Chromium	98	(80 - 120)	SW846 6010B	08/06-08/09/01	EHHRK1EW
		Dilution Factor: 1			
Lead	99	(80 - 120)	SW846 6010B	08/06-08/09/01	EHHRK1EX
		Dilution Factor: 1			
Selenium	105	(80 - 120)	SW846 6010B	08/06-08/09/01	EHHRK1E0
		Dilution Factor: 1			
Thallium	100	(80 - 120)	SW846 6010B	08/06-08/09/01	EHHRK1E1
		Dilution Factor: 1			
Vanadium	98	(80 - 120)	SW846 6010B	08/06-08/09/01	EHHRK1E2
		Dilution Factor: 1			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: A1H020245 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bromide		WO#:EHF4M1AC-LCS/EHF4M1AD-LCSD LCS Lot-Sample#: A1H030000-219					
	96	(90 - 110)			MCAWW 300.0A	08/02/01	1215219
	96	(90 - 110)	0.20	(0-20)	MCAWW 300.0A	08/02/01	1215219
		Dilution Factor: 1					
Fluoride		WO#:EHF271AC-LCS/EHF271AD-LCSD LCS Lot-Sample#: A1H030000-221					
	96	(90 - 110)			MCAWW 300.0A	08/02/01	1215221
	96	(90 - 110)	0.0	(0-20)	MCAWW 300.0A	08/02/01	1215221
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: A1H020245 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		Work Order #: EHF3P1AC	LCS Lot-Sample#: A1H030000-220		
	94	(90 - 110)	MCAWW 300.0A	08/02/01	1215220
		Dilution Factor: 1			
Nitrate		Work Order #: EHF4N1AC	LCS Lot-Sample#: A1H030000-223		
	97	(90 - 110)	MCAWW 300.0A	08/02/01	1215223
		Dilution Factor: 1			
Sulfate		Work Order #: EHF4T1AC	LCS Lot-Sample#: A1H030000-224		
	100	(90 - 110)	MCAWW 300.0A	08/02/01	1215224
		Dilution Factor: 1			
Total phosphorus		Work Order #: EHKRW1AC	LCS Lot-Sample#: A1H070000-373		
	94	(53 - 134)	MCAWW 365.2	08/07/01	1219373
		Dilution Factor: 1			
Total Alkalinity		Work Order #: EH7Q01AC	LCS Lot-Sample#: A1H170000-495		
	102	(90 - 127)	MCAWW 310.1	08/16/01	1229495
		Dilution Factor: 1			
Total Alkalinity		Work Order #: EJMRE1AC	LCS Lot-Sample#: A1H280000-129		
	102	(90 - 127)	MCAWW 310.1	08/24/01	1240129
		Dilution Factor: 1			
Total Dissolved Solids		Work Order #: EJAX21AC	LCS Lot-Sample#: A1H170000-172		
	101	(69 - 120)	MCAWW 160.1	08/16-08/20/01	1229172
		Dilution Factor: 1			
Total Organic Carbon		Work Order #: EH8N61AC	LCS Lot-Sample#: A1H200000-204		
	95	(88 - 115)	MCAWW 415.1	08/17/01	1232204
		Dilution Factor: 1			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

DISSOLVED Metals

Client Lot #...: A1H020245 **Matrix.....:** WATER
Date Sampled...: 08/02/01 14:40 **Date Received..:** 08/03/01

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A1H030197-003 **Prep Batch #...:** 1218124							
Boron	100	(75 - 125)			SW846 6010B	08/06-08/09/01	EHF551EU
	99	(75 - 125)	1.3	(0-20)	SW846 6010B	08/06-08/09/01	EHF551EV
		Dilution Factor: 1					
Thallium	99	(75 - 125)			SW846 6010B	08/06-08/09/01	EHF551EX
	98	(75 - 125)	0.78	(0-20)	SW846 6010B	08/06-08/09/01	EHF551E0
		Dilution Factor: 1					
Vanadium	98	(75 - 125)			SW846 6010B	08/06-08/09/01	EHF551E2
	97	(75 - 125)	0.87	(0-20)	SW846 6010B	08/06-08/09/01	EHF551E3
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: A1H020245 **Matrix.....:** WATER
Date Sampled...: 08/15/01 10:00 **Date Received..:** 08/16/01

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		WO#:	EHC031GQ-MS/EHC031GR-MSD			MS Lot-Sample #:	A1H020152-001
	94	(56 - 137)			MCAWW 300.0A	08/02/01	1215220
	93	(56 - 137)	0.86	(0-20)	MCAWW 300.0A	08/02/01	1215220
		Dilution Factor: 2					
Nitrate		WO#:	EHC031GU-MS/EHC031GV-MSD			MS Lot-Sample #:	A1H020152-001
	101	(47 - 154)			MCAWW 300.0A	08/02/01	1215223
	100	(47 - 154)	1.6	(0-30)	MCAWW 300.0A	08/02/01	1215223
		Dilution Factor: 2					
Sulfate		WO#:	EHC031G2-MS/EHC031G3-MSD			MS Lot-Sample #:	A1H020152-001
	94	(38 - 155)			MCAWW 300.0A	08/02/01	1215224
	91	(38 - 155)	1.0	(0-20)	MCAWW 300.0A	08/02/01	1215224
		Dilution Factor: 2					
Total phosphorus		WO#:	EHD761AQ-MS/EHD761AR-MSD			MS Lot-Sample #:	A1H020246-001
	33	(10 - 156)			MCAWW 365.2	08/07/01	1219373
	147	(10 - 156)	6.7	(0-26)	MCAWW 365.2	08/07/01	1219373
		Dilution Factor: 1					
Total Alkalinity		WO#:	EH4101AM-MS/EH4101AN-MSD			MS Lot-Sample #:	A1H160194-007
	23	(10 - 160)			MCAWW 310.1	08/16/01	1229495
	19	(10 - 160)	19	(0-24)	MCAWW 310.1	08/16/01	1229495
		Dilution Factor: 1					
Total Organic Carbon		WO#:	EH4101AU-MS/EH4101AV-MSD			MS Lot-Sample #:	A1H160194-007
	89	(72 - 136)			MCAWW 415.1	08/17/01	1232204
	89	(72 - 136)	0.86	(0-20)	MCAWW 415.1	08/17/01	1232204
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: A1H160194 **Matrix.....:** WG
Date Sampled...: 08/15/01 10:00 **Date Received..:** 08/16/01

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride			WO#: EH4101AC-MS/EH4101AD-MSD			MS Lot-Sample #: A1H160194-007	
	82	(56 - 137)			MCAWW 300.0A	08/17/01	1232422
	69	(56 - 137)	0.96	(0-20)	MCAWW 300.0A	08/17/01	1232422
		Dilution Factor: 10					
					Instrument ID..: NO INST	Analyst ID.....: 002509	
Nitrate			WO#: EH4101AF-MS/EH4101AG-MSD			MS Lot-Sample #: A1H160194-007	
	103	(47 - 154)			MCAWW 300.0A	08/16/01	1229149
	106	(47 - 154)	3.4	(0-30)	MCAWW 300.0A	08/16/01	1229149
		Dilution Factor: 1					
					Instrument ID..: NO INST	Analyst ID.....: 002509	
Sulfate			WO#: EH4101AJ-MS/EH4101AK-MSD			MS Lot-Sample #: A1H160194-007	
	42	(38 - 155)			MCAWW 300.0A	08/17/01	1232423
	18	(38 - 155)	1.5	(0-20)	MCAWW 300.0A	08/17/01	1232423
		Dilution Factor: 10					
					Instrument ID..: NO INST	Analyst ID.....: 002509	
Total Alkalinity			WO#: EH4101AM-MS/EH4101AN-MSD			MS Lot-Sample #: A1H160194-007	
	23	(10 - 160)			MCAWW 310.1	08/16/01	1229495
	19	(10 - 160)	19	(0-24)	MCAWW 310.1	08/16/01	1229495
		Dilution Factor: 1					
					Instrument ID..: NO INST	Analyst ID.....: 000012	
Total Organic Carbon			WO#: EH4101AU-MS/EH4101AV-MSD			MS Lot-Sample #: A1H160194-007	
	89	(72 - 136)			MCAWW 415.1	08/17/01	1232204
	89	(72 - 136)	0.86	(0-20)	MCAWW 415.1	08/17/01	1232204
		Dilution Factor: 1					
					Instrument ID..: NO INST	Analyst ID.....: 000014	
Total Sulfide			WO#: EH4101AQ-MS/EH4101AR-MSD			MS Lot-Sample #: A1H160194-007	
	96	(72 - 110)			MCAWW 376.1	08/20/01	1233564
	97	(72 - 110)	0.79	(0-20)	MCAWW 376.1	08/20/01	1233564
		Dilution Factor: 1					
					Instrument ID..: NO INST	Analyst ID.....: 000012	

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A1H020245 Work Order #...: EHD5N-SMP Matrix.....: WG
EHD5N-DUP
Date Sampled...: 08/01/01 14:20 Date Received..: 08/02/01
% Moisture.....: Dilution Factor: Initial Wgt/Vol:

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Bicarbonate Alkalinity						SD Lot-Sample #:	A1H020245-003	
	73	73	mg/L	0.47	(0-20)	MCAWW 310.1	08/24/01	1239436

Dilution Factor: 1

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A1H020245 **Work Order #...:** EH0QD-SMP EH0QD-DUP **Matrix.....:** WATER

Date Sampled...: 08/13/01 08:30 **Date Received..:** 08/14/01

% Moisture.....: 100 **Dilution Factor:** **Initial Wgt/Vol:**

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Dissolved Solids						SD Lot-Sample #:	H1H140225-001	
	99	94	mg/L	5.2	(0-20)	MCAWW 160.1	08/16-08/20/01	1229172

Dilution Factor: 1

Chain of Custody Record

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

STL-4124 (1200)

Client: URS Corp	Project Manager: Margie Ray	Date: 8-1-01	Chain of Custody Number: 076073
Address: 5540 Falmouth St.	Telephone Number (Area Code)/Fax Number: 804/965-9000 / 804-965-9764	Lab Number	Page 1 of 1
City: Richmond; State: VA; Zip Code: 23230	Site Contact: Margie Ray	Lab Contact: A. Danford	
Project Name and Location (State): Chesapeake GC, Chesapeake, VA	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.: 49498-001			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed	Soil	Containers & Preservatives: Unpres	H2SO4	HNOS	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt
MW-1 Center	8-1-01	1:00		✓			1	1	1					See attached list for metals field filtered parameters
MW-2 NE	8-1-01	2:15		✓			1	1	1					
MW-2 NE Dup.	8-1-01	2:20		✓			1	1	1					
MW-3 SE	8-1-01	3:25		✓			1	1	1					

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other Per Quote, attached

QC Requirements (Specify)

1. Relinquished By: Margie Ray	Date: 8-1-01	Time: 6:15 pm	1. Received By: [signature]	Date: 8-2-01	Time: 0930
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Stays with the Sample, CANARY - Returned to Client with Report, PINK - Field Copy

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STL North Canton

20216

SEVERN TRENT SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
Fax: 330 497 0772
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 49498-001

CHESAPEAKE GOLF COURSE, VA

Lot #: A1G270273

MARGIE RAY

URS
5540 Faimouth Street
Suite 201
Richmond, VA 23230

SEVERN TRENT LABORATORIES, INC.

Alesia M. Danford
Project Manager

August 20, 2001

STL North Canton is a part of Severn Trent Laboratories, Inc.

CASE NARRATIVE
A1G270273

The following report contains the analytical results for five solid samples submitted to STL North Canton by URS from the Chesapeake Golf Course, VA site, project number 49-49498-001. The samples were received July 27, 2001, according to documented sample acceptance procedures.

The pH analysis was requested by Margie Ray on August 16, 2001.

STL North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. Preliminary results were provided to Margie Ray on August 10, 13 and 17, 2001.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

The temperature of the cooler upon sample receipt was 11.7° C. The samples were received with wet ice present.

See STL's Cooler Receipt Form for additional information.

METALS

Serial dilution of a sample in this lot indicates that physical and chemical interferences were present. Refer to the sample report pages for the affected analytes.

GENERAL CHEMISTRY

Some samples had elevated reporting limits due to matrix interferences or dilution.