Appendix A
GPR Report

Geophysical Surveys to Locate
Underground Structures
Raytheon Site
Wayland, Massachusetts

Prepared for
ERM NEW ENGLAND, INC.
February 1996

GEOPHYSICAL
APPLICATIONS
INCORPORATED

February 1, 1996

Mr. John Drobinski
ERM NEW ENGLAND, INC.
205 Portland Street
Boston, MA 02114

Subject: Geophysical Surveys to Locate Underground Structures
Raytheon Site
Wayland, Massachusetts

Dear Mr. Drobinski:

Geophysical Applications, Inc. performed geophysical surveys on October 12 and 13, 1995 to help locate drywells, pipes, and other underground structures at the above-noted site. A preliminary report describing the survey methods and interpreted results of this investigation was submitted October 23, 1995. This revised report incorporates comments from Raytheon's reviewers.

LOCATION AND SURVEY CONTROL

GPR survey areas are shown on Figures 1 through 4. Geophysical survey traverses were referenced via taped distance measurements to exterior building walls. A reference grid was marked on the ground surface with chalk at 5-foot intervals throughout each survey area. The corners of large underground structures inferred at Area D were marked with spray paint.

METHOD OF INVESTIGATION

A GSSI SIR-3 radar instrument was used with a 500 megahertz antenna during this survey. GPR data were collected continuously along perpendicular traverses, and displayed on a chart recorder for immediate inspection. Perpendicular GPR traverses were generally 2.5 to 5 feet apart, to help locate relatively small objects.

The horizontal scale on each GPR record was determined by the antenna speed, and survey stations were noted by pressing a marker button as the antenna passed each grid node. The vertical scale of radar cross sections recorded during this survey was 60 nanoseconds. This time interval was selected to be greater than the anticipated maximum two-way travel time during which real GPR reflections might be observed.

The GPR method is based on the principle that microwave energy transmitted into the ground is reflected back to the surface by materials with contrasting electrical properties. Metal pipes and larger underground structures typically produce high-amplitude hyperbolic GPR reflections.

Plotting the horizontal positions of observed reflections on a base map often enables an interpreter to identify an underground structure's lateral extent, or a pipe's trend.

SURVEY LIMITATIONS

GPR signal penetration is site specific, determined by dielectric properties of local soil or fill materials. Electrically-conductive fill materials or reinforced concrete may have attenuated GPR signals and hindered detection of small objects at this site. GPR signal penetration was estimated to vary between 0.5 to 8 feet below ground surface.

GPR interpretations are subjective, based on identifying reflection patterns that may not uniquely represent a subsurface object. Metallic pipes or large underground structures typically produce strong GPR reflections, whereas clay or other non-metallic pipes produce weaker reflections that can be difficult to discern. Recording data along perpendicular traverses helps determine the size and shape of buried objects. GPR data analysis is more subjective than most other geophysical methods, and confirming GPR interpretations via test pits, borings, or other direct means is strongly recommended.

Varying the speed at which the antenna is moved along a survey traverse can cause slight errors in horizontal distance interpolations and inferred object positions. Distance interpolation errors were minimized during this survey by using five-foot distance marks.

RESULTS

Significant GPR reflectors observed during this survey are presented on Figures 2 through 4. Key interpreted results from each survey area are reviewed below.

Area A

The objective at this survey area was to help locate pipes near drywell no. 1 (represented by a manhole cover on Figure 2). Line 0W is along the western outside wall of building no. 2 and Line 0N is 10 feet north of a building corner.

GPR reflections indicate a pipe unrelated to the drywell that trends through the entire survey area near Line 30N. Another series of weak point targets may represent a pipe that trends south from the drywell to approximately Line 10N. GPR data did not indicate this pipe's trend further south or west.

Area B

The survey objective at this area was to locate a drywell that was not visible at the ground surface, and to trace pipes leading to drywell no. 3 (located near grid coordinate 10S/77E). Line

0S was along the southern side of the former XFMR lab in building no. 2, and Line 0E was located at the building's corner.

GPR signal penetration was limited to a depth of only about one foot between approximately Lines 50E and 85E, from Line 20S to 10S or 15S. Asphalt pavement in this area may be underlain by a concrete slab that attenuated GPR signals.

Pipes were detected trending north from drywell no. 3 towards the former XFMR lab, and south from the drywell to approximately Line 20S. The southern pipe could not be detected south of Line 20S, and it may connect to an east-west sewer pipe. The sewer pipe may have been detected along Line 20S between Stations 0E and 25E, and Raytheon personnel stated that the sewer pipe continues further east near grid Line 20S.

A localized GPR anomaly along Line 25S between Stations 65E and 70E strongly resembles a small drywell. A test pit is suggested at this location to confirm the cause of this GPR anomaly.

Area C

This area was located at the eastern end of a driveway between buildings 2 and 3. The survey objective was to locate pipes leading to and from drywell no. 4. This drywell's manhole cover was visible near grid coordinate 4N/19W. Line 0N was along the northern side of a metal-sided building (no. 17), and Line 5W is five feet west of a brick building (no. 1N).

Several GPR point targets (small, discrete objects) were observed in this area. Some point targets are judged to align and may represent pipes trending northwest and south from drywell no. 4. The pipe trending northwest from the drywell was visually confirmed by examining the drywell's interior. The pipe trending south from the drywell is tentatively inferred from relatively weak GPR reflections.

Area D

Area D is located west of an old machine shop in building no. 3. Line 25W is located 25 feet west of building no. 3's west side, approximately along the pavement's eastern edge. Line 25N is parallel to building no. 3's north side.

The objective at the larger portion of Area D was to locate a suspected underground gasoline storage tank (WAY-03). This structure was depicted on ERM's site plan near grid coordinate 25N/70W, coincident with a large boulder and ornamental trees.

The smaller portion of Area D was surveyed to locate pipes that might trend to or from a drywell.

Two large underground structures are inferred from GPR data within the larger portion of Area D. The larger structure is interpreted along Line 75W, between Stations 42N through 60N. A second, smaller object is interpreted along coordinate 46W, between Stations 30N through 40N.

A third underground structure was tentatively identified during the field program near grid coordinate 22.5N/27.5W. Upon further inspection, GPR reflections in this area were judged to represent two closely-spaced pipes.

Area E

This area was surveyed to locate any subsurface structures or disturbed stratigraphy that might represent a former disposal site. Line 0N is along the north side of building no. 4, and Line 0W is parallel to the west side of the former PCB shop in building no. 16.

Numerous pipes were detected throughout Area E, as shown on Figure 4. An area where GPR signal penetration appeared to be limited (possibly due to electrically-conductive soils) is generally north of Line 30N between Lines 0W and 46W.

GPR reflections judged to represent a small underground structure were detected along Line 46W between Stations 22N and 30N. Raytheon personnel noted that these reflections are close to a fire protection standpipe. Raytheon thus suspected that these GPR reflections were caused by a portion of the fire protection system's pipe that is locally shallow.

Strong GPR reflections along Lines 5W, 10W, 15W, and 20W between Stations 8N to 12N resembled a large underground structure. However, a similar strong reflection was not observed along the long axis of this object, and the reflections may thus represent a pipe instead of a larger structure.

GPR anomalies indicating a drywell were not observed at this area.

Area F

GPR profiling was conducted at the eastern end of a driveway between building nos. 3 and 4 to locate a small waste-oil storage tank. Line 0N was along the northern side of building no. 4, and Line 0W was along the western side of building no. 1C. Survey coverage was limited by a large trailer that could not be moved prior to the GPR survey, and also by mechanical equipment north and east of coordinate 35N/20W.

A large area exhibited limited GPR signal penetration, between Lines 7.5W through 47.5W, west and south of the trailer. GPR signals may have been attenuated by concrete or electrically-conductive soil or backfill materials within this region.

Three areas are suggested for confirmation via test pits. The highest priority area is centered near Line 37.5N, Station 35W where a shallow pipe appears to trend southwest from building no. 3 to a larger underground structure.

Lower priority is suggested for the remaining test pits shown on Figure 4. A suggested test pit near grid coordinate 47.5W/37.5N is within a region that Raytheon personnel stated was recently excavated. These reflections might represent a non-metallic object within backfill. Another suggested pit near coordinate 2.5W/27N may confirm a large-diameter pipe instead of a large underground structure.

* * * * *

We suggest placing any test borings or monitoring wells at least three feet from observed GPR reflections to minimize the risk of damage to underground structures. Please call the undersigned at (508)543-1388 if you have any questions regarding this report. We appreciate this opportunity to provide geophysical services to ERM New England, and we welcome inquiries regarding this or future assignments.

Sincerely,

GEOPHYSICAL APPLICATIONS, INC.

M. Blackey

Mark E. Blackey
Principal and Geophysicist

95027 - erm_10.rpt

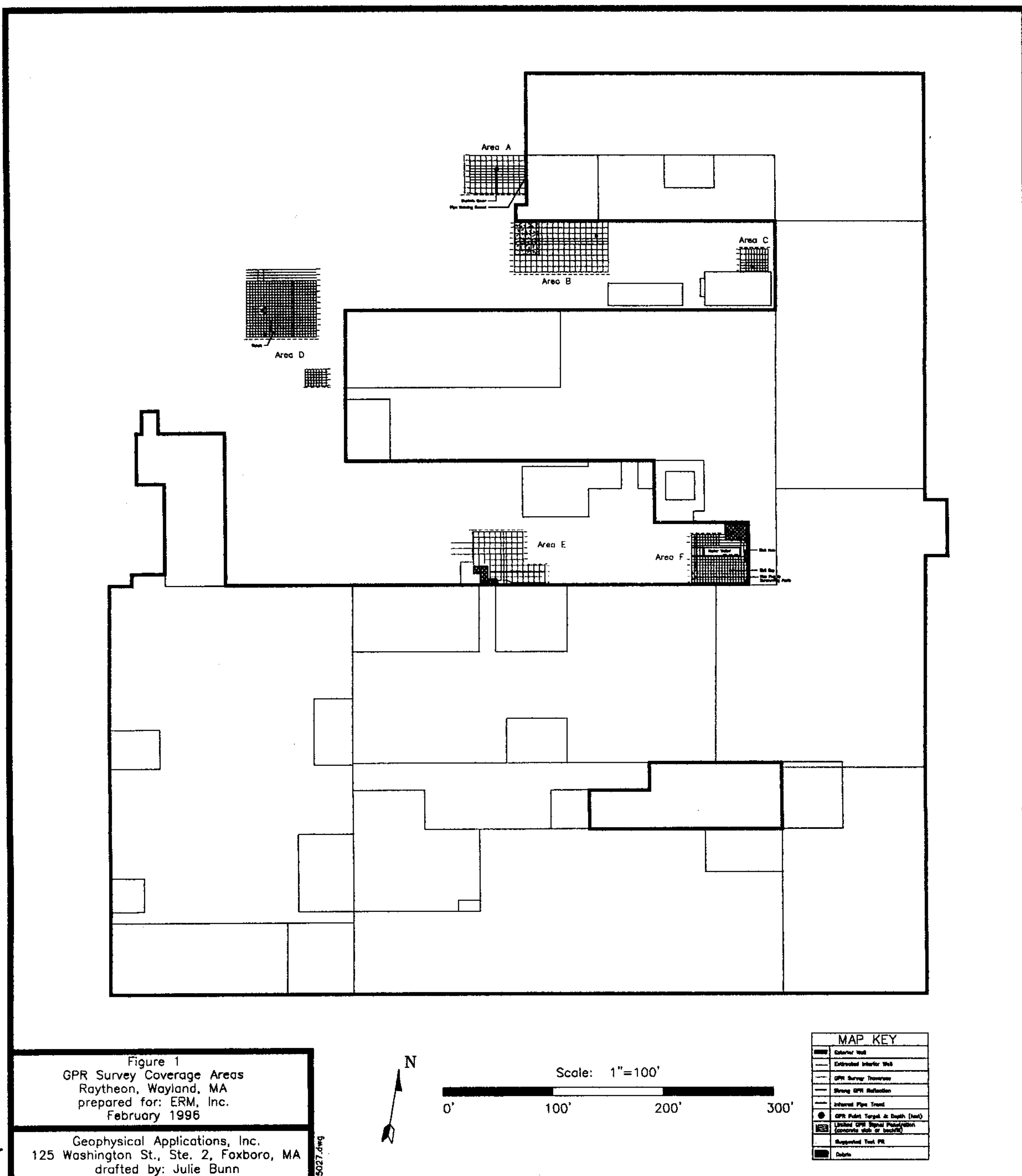
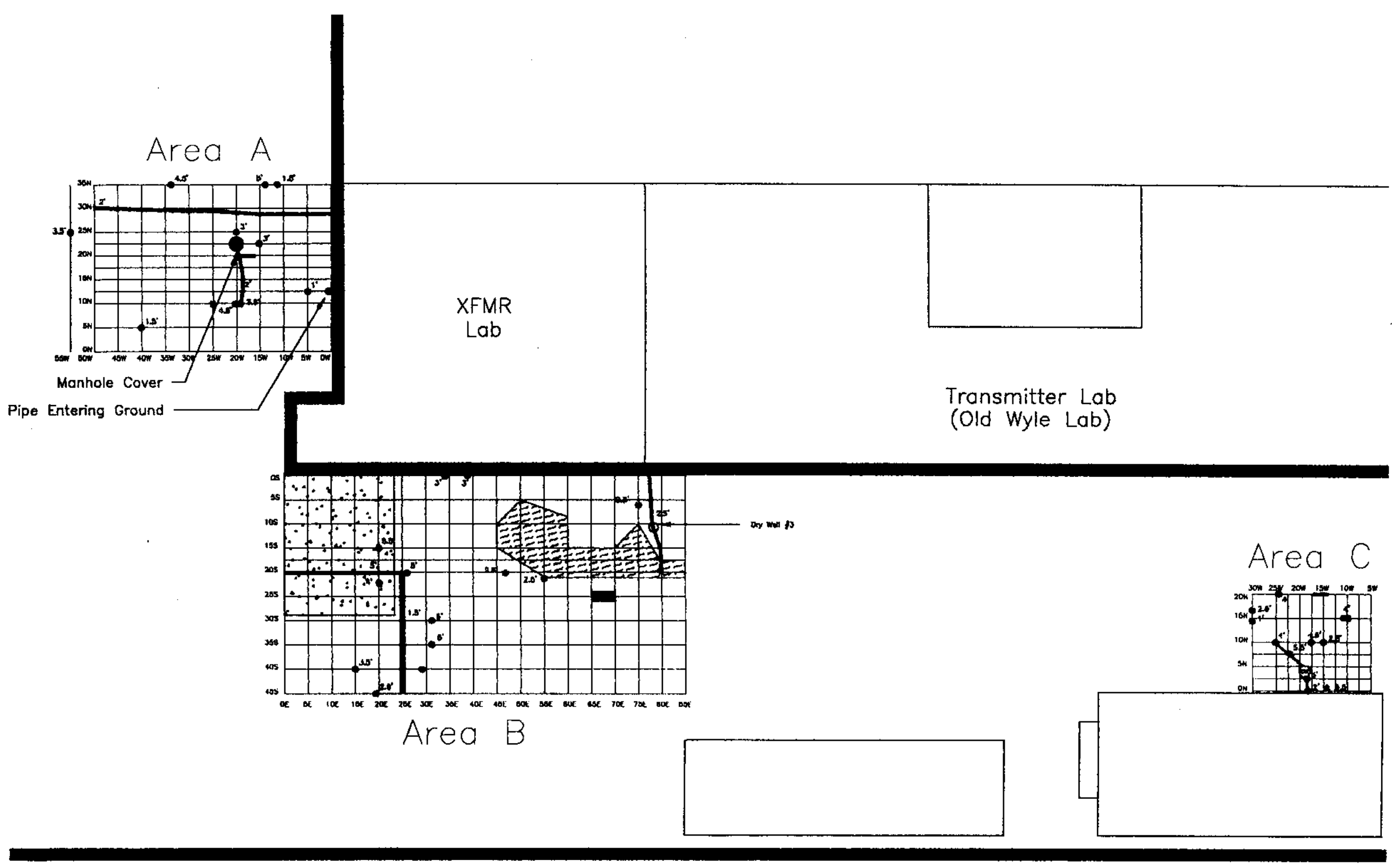


Figure 1
GPR Survey Coverage Areas
Raytheon, Wayland, MA
prepared for: ERM, Inc.
February 1996

Geophysical Applications, Inc.
125 Washington St., Ste. 2, Foxboro, MA
drafted by: Julie Bunn

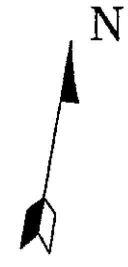


Scale: 1"=30'

0' 30' 60' 90'

Figure 2
GPR Survey Coverage and Results
Areas A, B, and C
Raytheon, Wayland, MA
prepared for: ERM, Inc.
February 1996

Geophysical Applications, Inc.
125 Washington St., Ste. 2, Foxboro, MA



MAP KEY

	Exterior Wall
	Estimated Interior Wall
	GPR Survey Traverses
	Strong GPR Reflection
	Inferred Pipe Trend
	GPR Point Target & Depth (feet)
	Limited GPR Signal Penetration (concrete slab or backfill)
	Suggested Test Pit
	Debris

2

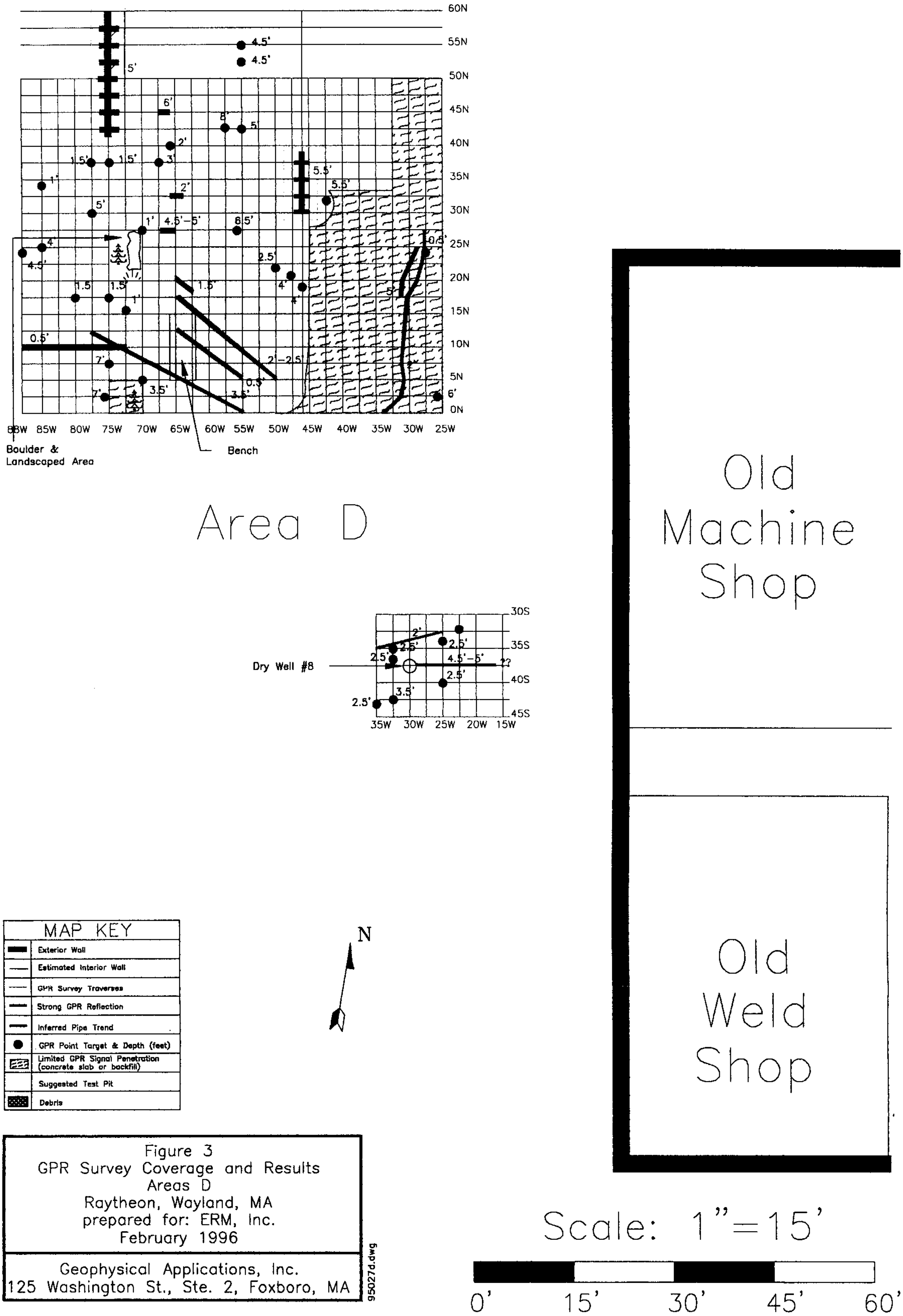
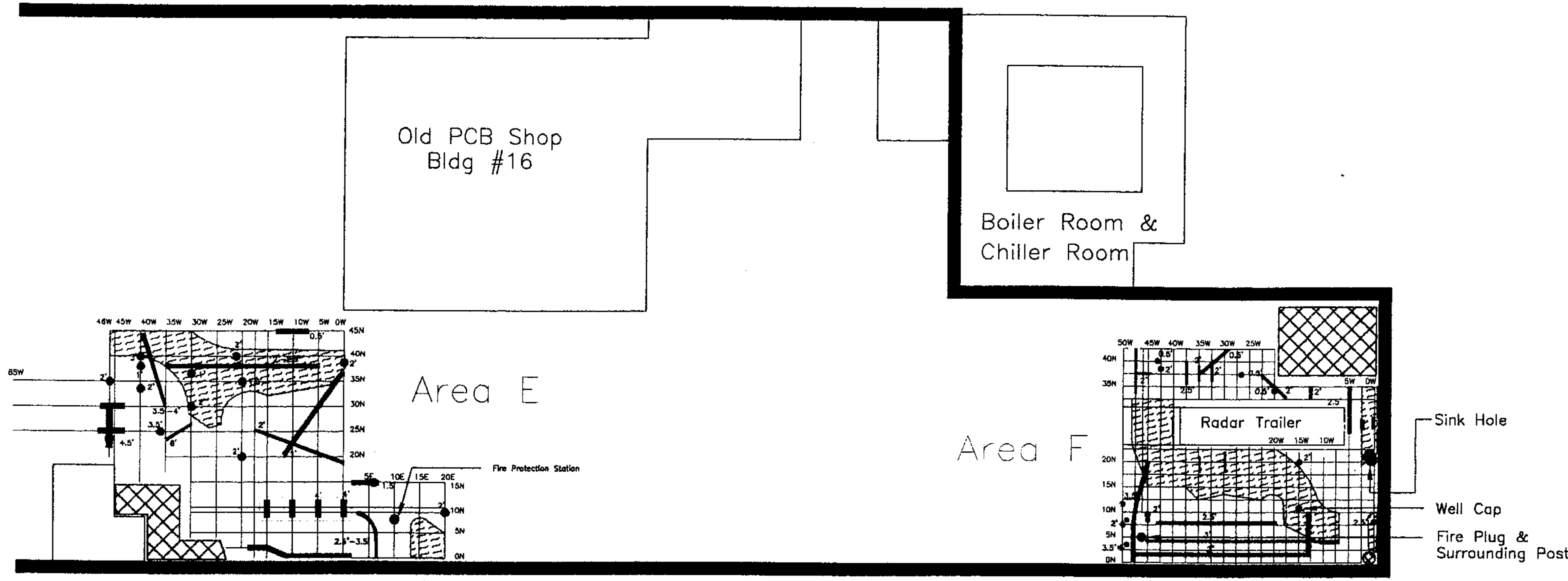


Figure 3
GPR Survey Coverage and Results
Areas D
Raytheon, Wayland, MA
prepared for: ERM, Inc.
February 1996

Geophysical Applications, Inc.
125 Washington St., Ste. 2, Foxboro, MA

3



N

MAP KEY	
(thick line)	Exterior Wall
(thin line)	Estimated Interior Wall
(thin line)	GPR Survey Traverses
(heavy line)	Strong GPR Reflection
(heavy line)	Inferred Pipe Trend
●	GPR Point Target & Depth (feet)
(hatched)	Limited GPR Signal Penetration (concrete slab or backfill)
	Suggested Test Pit
(cross-hatched)	Debris

Scale: 1"=25'

0' 25' 50' 75'

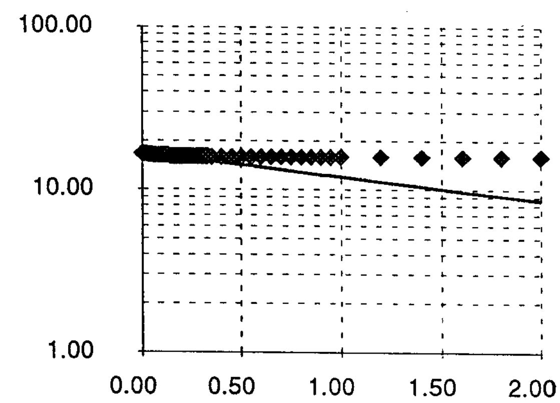
Figure 4
GPR Survey Coverage and Results
Areas E and F
Raytheon, Wayland, MA
prepared for: ERM, Inc.
February 1996

Geophysical Applications, Inc.
125 Washington St., Ste. 2, Foxboro, MA

Bouwer & Rice Method for Calculating Hydraulic Conductivity

Project Name: Raytheon, Wayland
Project No.: 143.4
Client Name: Raytheon
Identification: MW-13
User Name: JRD/CAF
Run Date: 3/6/96

Riser Pipe Diameter:	0.33	feet
Intake Diameter:	0.5	feet
Intake Length:	11	feet
Saturated Column Length:	6.74	feet
Water Table Depth:	15.92	feet
Aquifer Thickness:	20	feet
Line Fit Starting No.:	1	Min 1 to
Line Fit Ending No.:	11	Max 53
Specify Output Units:	7	1 to 9
K(h):	4.82E-04	cm./sec.
Correlation Coefficient:	0.9656	



Meas. #	Time minutes	Field Meas. feet	Drawdown/up feet		Line Fit To LN(Yt)	Regression On LN(Yt)
1)	0.00	-0.78	16.70		2.815	2.811
2)	0.01	-0.70	16.62		2.810	2.808
3)	0.02	-0.59	16.51		2.804	2.804
4)	0.03	-0.51	16.43		2.799	2.801
5)	0.04	-0.43	16.35		2.794	2.798
6)	0.05	-0.37	16.29		2.791	2.794
7)	0.06	-0.32	16.24		2.788	2.791
8)	0.07	-0.30	16.22		2.786	2.787
9)	0.08	-0.27	16.19		2.784	2.784
10)	0.09	-0.24	16.16		2.783	2.781
11)	0.10	-0.23	16.15		2.782	2.777
12)	0.11	-0.22	16.14		2.781	2.774
13)	0.12	-0.21	16.13		2.781	2.771
14)	0.13	-0.20	16.12		2.780	2.767
15)	0.14	-0.20	16.12		2.780	2.764
16)	0.15	-0.19	16.11		2.780	2.761
17)	0.16	-0.19	16.11		2.779	2.757
18)	0.17	-0.18	16.10		2.779	2.754
19)	0.18	-0.18	16.10		2.779	2.750
20)	0.19	-0.18	16.10		2.779	2.747
21)	0.20	-0.17	16.09		2.778	2.744
22)	0.21	-0.17	16.09		2.778	2.740
23)	0.22	-0.17	16.09		2.778	2.737
24)	0.23	-0.17	16.09		2.778	2.734
25)	0.24	-0.16	16.08		2.778	2.730
26)	0.25	-0.16	16.08		2.778	2.727
27)	0.26	-0.16	16.08		2.777	2.724
28)	0.27	-0.16	16.08		2.777	2.720
29)	0.28	-0.15	16.07		2.777	2.717
30)	0.29	-0.15	16.07		2.777	2.714
31)	0.30	-0.15	16.07		2.777	2.710
32)	0.31	-0.15	16.07		2.777	2.707

Bouwer & Rice Method for Calculating Hydraulic Conductivity

Project Name: Raytheon, Wayland
Project No.: 143.4
Client Name: Raytheon
Identification: MW-13
User Name: JRD/CAF
Run Date: 3/6/96

Riser Pipe Diameter:	0.33	feet
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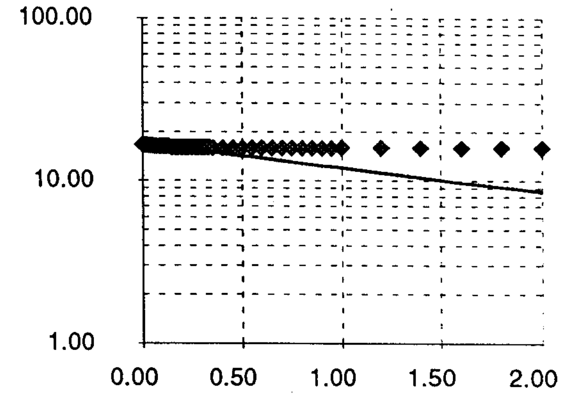
Line Fit Ending No.:	11	Max 53
Specify Output Units:	7	1 to 9
K(h):	4.82E-04	cm./sec.
Correlation Coefficient:	0.9656	

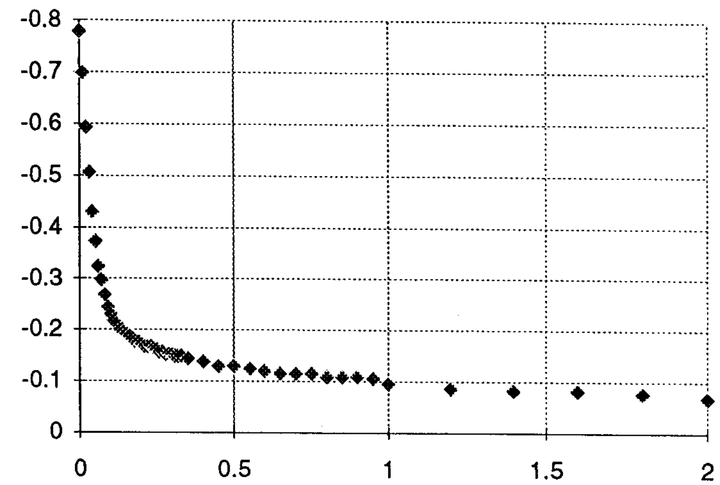


Meas. #	Time minutes	Field Meas. feet	Drawdown/up feet		Line Fit To LN(Yt)	Regression On LN(Yt)
33)	0.32	-0.15	16.07		2.777	2.703
34)	0.33	-0.15	16.07		2.777	2.700
35)	0.35	0.14	15.78		2.759	2.693
36)	0.40	0.14	15.78		2.759	2.677
37)	0.45	0.13	15.79		2.760	2.660
38)	0.50	0.13	15.79		2.760	2.643
39)	0.55	0.12	15.80		2.760	2.626
40)	0.60	0.12	15.80		2.760	2.609
41)	0.65	0.11	15.81		2.760	2.592
42)	0.70	0.11	15.81		2.760	2.576
43)	0.75	0.11	15.81		2.760	2.559
44)	0.80	0.11	15.81		2.761	2.542
45)	0.85	0.11	15.81		2.761	2.525
46)	0.90	0.11	15.81		2.761	2.508
47)	0.95	0.11	15.82		2.761	2.492
48)	1.00	0.10	15.83		2.762	2.475
49)	1.20	0.09	15.84		2.762	2.408
50)	1.40	0.08	15.84		2.762	2.340
51)	1.60	0.08	15.84		2.762	2.273
52)	1.80	0.08	15.84		2.763	2.206
53)	2.00	0.07	15.85		2.763	2.139

SLUG TEST DATA ENTRY FORM

Client Name:	Raytheon	Well Number:	MW-13	Test Type:	Rising Head
Project No.:	143.4	Topo. Elev.:		Weather:	Snowing
Project Name:	Raytheon, Wayland	Tested By:	JRD/CAF	Date Started:	3/6/96

BASIC TEST DATA	
Measurement Units (1-6):	2
Unconfined(1)/Confined(2):	1
Well Depth - TOC (feet):	22.66
Static W/L-Depth (ft.):	15.92
Riser Pipe Diameter (feet):	0.33
Initial Test Depth Value (ft.):	0.778
TOC Elevation (feet):	
Intake/Soil Col. Diam. (feet):	0.5
Depth to Top of Pack (feet):	2
Intake/Soil Col. Length (ft.):	11
Saturat. Col. Thickness (ft.):	6.74
Casing Soil Length (if appl.):	
Casing Stickup (feet):	
Slug Volume (ft3):	
Thickness of Aquifer (feet):	20



AQUIFER RECOVERY DATA

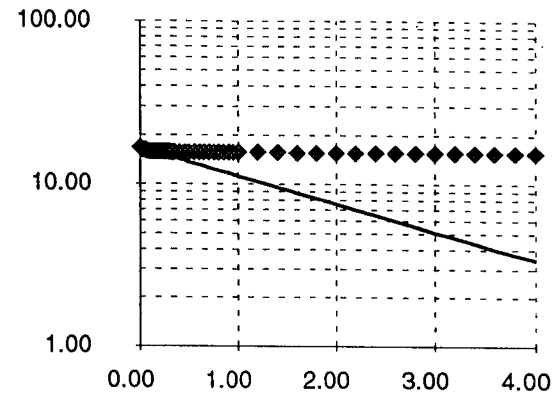
Time (min)	Depth (ft.)	Time (min)	Depth (ft.)	Time (min)	Depth (ft.)	Time (min)	Depth (ft.)
0	-0.778	0.25	-0.162	1.6	-0.081		
0.01	-0.697	0.26	-0.157	1.8	-0.076		
0.02	-0.592	0.27	-0.157	2	-0.066		
0.03	-0.506	0.28	-0.152				
0.04	-0.429	0.29	-0.152				
0.05	-0.372	0.3	-0.152				
0.06	-0.324	0.31	-0.148				
0.07	-0.296	0.32	-0.148				
0.08	-0.267	0.33	-0.148				
0.09	-0.243	0.35	-0.143				
0.1	-0.229	0.4	-0.138				
0.11	-0.219	0.45	-0.128				
0.12	-0.21	0.5	-0.128				
0.13	-0.2	0.55	-0.124				
0.14	-0.195	0.6	-0.119				
0.15	-0.191	0.65	-0.114				
0.16	-0.186	0.7	-0.114				
0.17	-0.181	0.75	-0.114				
0.18	-0.176	0.8	-0.109				
0.19	-0.176	0.85	-0.109				
0.2	-0.171	0.9	-0.109				
0.21	-0.167	0.95	-0.105				
0.22	-0.167	1	-0.095				
0.23	-0.167	1.2	-0.085				
0.24	-0.162	1.4	-0.081				

Bouwer & Rice Method for Calculating Hydraulic Conductivity

Project Name: Raytheon, Wayland
Client Name: Raytheon
User Name: JRD/CAF
Run Date: 3/6/96

Project No.: 143.4
Identification: RAY-01

Riser Pipe Diameter:	0.33	feet
Intake Diameter:	0.5	feet
Intake Length:	11	feet
Saturated Column Length:	9.17	feet
Water Table Depth:	15.4	feet
Aquifer Thickness:	20	feet
Line Fit Starting No.:	1	Min 1 to
Line Fit Ending No.:	11	Max 64
Specify Output Units:	7	1 to 9
K(h):	6.08E-04	cm./sec.
Correlation Coefficient:	0.8753	

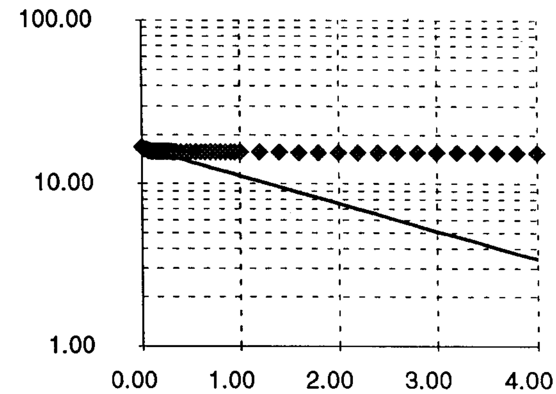


Meas. #	Time minutes	Field Meas. feet	Drawdown/up feet		Line Fit To LN(Yt)	Regression On LN(Yt)
33)	0.31	-0.30	15.70		2.754	2.681
34)	0.32	-0.30	15.70		2.754	2.677
35)	0.33	-0.29	15.69		2.753	2.673
36)	0.35	-0.29	15.69		2.753	2.665
37)	0.40	-0.28	15.68		2.752	2.645
38)	0.45	-0.26	15.66		2.751	2.626
39)	0.50	-0.25	15.65		2.751	2.606
40)	0.55	-0.25	15.65		2.750	2.586
41)	0.60	-0.24	15.64		2.750	2.567
42)	0.65	-0.23	15.63		2.749	2.547
43)	0.70	-0.23	15.63		2.749	2.527
44)	0.75	-0.22	15.62		2.748	2.507
45)	0.80	-0.21	15.61		2.748	2.488
46)	0.85	-0.21	15.61		2.748	2.468
47)	0.90	-0.21	15.61		2.748	2.448
48)	0.95	-0.20	15.60		2.747	2.429
49)	1.00	-0.19	15.59		2.747	2.409
50)	1.20	-0.18	15.58		2.746	2.330
51)	1.40	-0.16	15.56		2.745	2.251
52)	1.60	-0.15	15.55		2.744	2.172
53)	1.80	-0.14	15.54		2.743	2.094
54)	2.00	-0.13	15.53		2.743	2.015
55)	2.20	-0.12	15.52		2.742	1.936
56)	2.40	-0.11	15.51		2.741	1.857
57)	2.60	-0.10	15.50		2.741	1.778
58)	2.80	-0.09	15.49		2.740	1.699
59)	3.00	-0.09	15.49		2.740	1.621
60)	3.20	-0.08	15.48		2.739	1.542
61)	3.40	-0.07	15.47		2.739	1.463
62)	3.60	-0.07	15.47		2.739	1.384
63)	3.80	-0.06	15.46		2.738	1.305
64)	4.00	-0.05	15.45		2.738	1.227

Bouwer & Rice Method for Calculating Hydraulic Conductivity

Project Name:	Raytheon, Wayland	Project No.:	143.4
Client Name:	Raytheon	Identification:	RAY-01
User Name:	JRD/CAF		
Run Date:	3/6/96		

Riser Pipe Diameter:	0.33	feet
Intake Diameter:	0.5	feet
Intake Length:	11	feet
Saturated Column Length:	9.17	feet
Water Table Depth:	15.4	feet
Aquifer Thickness:	20	feet
Line Fit Starting No.:	1	Min 1 to
Line Fit Ending No.:	11	Max 64
Specify Output Units:	7	1 to 9
K(h):	6.08E-04	cm./sec.
Correlation Coefficient:	0.8753	

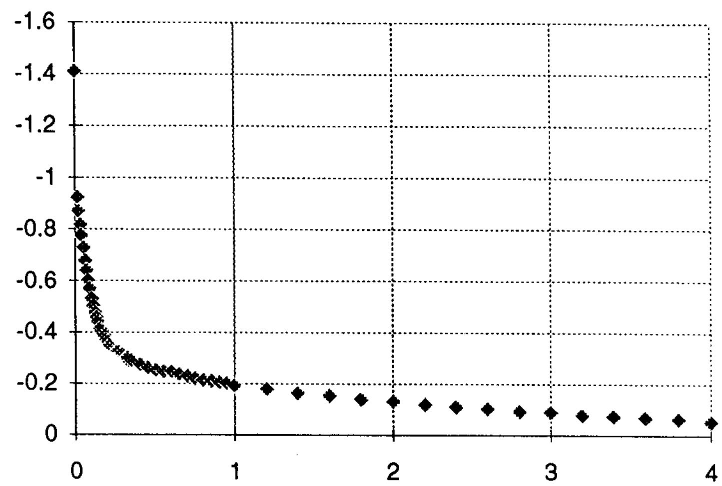


Meas. #	Time minutes	Field Meas. feet	Drawdown/up feet		Line Fit To LN(Yt)	Regression On LN(Yt)
1)	0.00	-1.41	16.81		2.822	2.803
2)	0.01	-0.92	16.32		2.792	2.799
3)	0.02	-0.87	16.27		2.789	2.795
4)	0.03	-0.82	16.22		2.786	2.791
5)	0.04	-0.77	16.17		2.783	2.787
6)	0.05	-0.73	16.13		2.780	2.783
7)	0.06	-0.68	16.08		2.777	2.779
8)	0.07	-0.64	16.04		2.775	2.776
9)	0.08	-0.60	16.00		2.773	2.772
10)	0.09	-0.57	15.97		2.771	2.768
11)	0.10	-0.53	15.93		2.768	2.764
12)	0.11	-0.50	15.90		2.766	2.760
13)	0.12	-0.48	15.88		2.765	2.756
14)	0.13	-0.46	15.86		2.764	2.752
15)	0.14	-0.44	15.84		2.762	2.748
16)	0.15	-0.42	15.82		2.761	2.744
17)	0.16	-0.41	15.81		2.760	2.740
18)	0.17	-0.39	15.79		2.759	2.736
19)	0.17	-0.39	15.79		2.759	2.736
20)	0.18	-0.38	15.78		2.759	2.732
21)	0.19	-0.37	15.77		2.758	2.728
22)	0.20	-0.36	15.76		2.758	2.724
23)	0.21	-0.35	15.75		2.757	2.720
24)	0.22	-0.34	15.74		2.756	2.716
25)	0.23	-0.33	15.73		2.756	2.712
26)	0.24	-0.33	15.73		2.756	2.709
27)	0.25	-0.32	15.72		2.755	2.705
28)	0.26	-0.32	15.72		2.755	2.701
29)	0.27	-0.32	15.72		2.755	2.697
30)	0.28	-0.32	15.72		2.755	2.693
31)	0.29	-0.31	15.71		2.754	2.689
32)	0.30	-0.31	15.71		2.754	2.685

SLUG TEST DATA ENTRY FORM

Client Name: Raytheon | Well Number: RAY-01 | Test Type: Rising Head
Project No.: 143.4 | Topo. Elev.: | Weather: Snowing
Project Name: Raytheon, Wayland | Tested By: JRD/CAF | Date Started: 3/6/96

BASIC TEST DATA	
Measurement Units (1-6):	2
Unconfined(1)/Confined(2):	1
Well Depth - TOC (feet):	24.57
Static W/L-Depth (ft.):	15.4
Riser Pipe Diameter (feet):	0.33
Initial Test Depth Value (ft.):	1.409
TOC Elevation (feet):	
Intake/Soil Col. Diam. (feet):	0.5
Depth to Top of Pack (feet):	2
Intake/Soil Col. Length (ft.):	11
Saturat. Col. Thickness (ft.):	9.17
Casing Soil Length (if appl.):	
Casing Stickup (feet):	
Slug Volume (ft3):	
Thickness of Aquifer (feet):	20



AQUIFER RECOVERY DATA

Time (min)	Depth (ft.)	Time (min)	Depth (ft.)	Time (min)	Depth (ft.)	Time (min)	Depth (ft.)
0	-1.409	0.24	-0.329	1.4	-0.162		
0.01	-0.921	0.25	-0.324	1.6	-0.152		
0.02	-0.869	0.26	-0.324	1.8	-0.138		
0.03	-0.816	0.27	-0.32	2	-0.129		
0.04	-0.773	0.28	-0.315	2.2	-0.119		
0.05	-0.726	0.29	-0.31	2.4	-0.109		
0.06	-0.678	0.3	-0.305	2.6	-0.1		
0.07	-0.64	0.31	-0.3	2.8	-0.09		
0.08	-0.601	0.32	-0.3	3	-0.085		
0.09	-0.568	0.33	-0.291	3.2	-0.076		
0.1	-0.53	0.35	-0.291	3.4	-0.071		
0.11	-0.501	0.4	-0.277	3.6	-0.066		
0.12	-0.477	0.45	-0.262	3.8	-0.062		
0.13	-0.458	0.5	-0.253	4	-0.052		
0.14	-0.439	0.55	-0.248				
0.15	-0.415	0.6	-0.243				
0.16	-0.406	0.65	-0.234				
0.17	-0.391	0.7	-0.229				
0.17	-0.391	0.75	-0.219				
0.18	-0.382	0.8	-0.214				
0.19	-0.367	0.85	-0.21				
0.2	-0.363	0.9	-0.205				
0.21	-0.348	0.95	-0.2				
0.22	-0.343	1	-0.191				
0.23	-0.334	1.2	-0.176				