

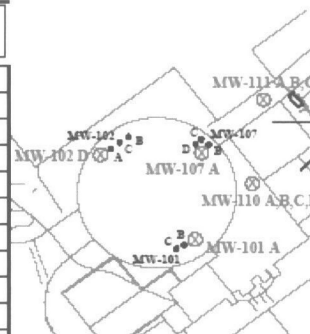
Appendix A
Geologist's Logs for Wells Drilled in 2006

GEOLOGIST'S LOG for Well #: MW-101A



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	D.L. Maher	Driller:	Kevin Regen
Date Started:	5-Apr-06	Date Finished:	11-Apr-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	5 feet
Casing Diam:	2 inches	Length:	18 feet
Boring Depth:	23.5 feet	Well Depth:	23 feet
Surface Elev.:	1138.0 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC casing extension above grade:	8.1 feet
		Slot Size:	0.010 inch
		Type:	Schedule 40 PVC
		Boring Diam.:	?? " telescoping to 5½"
		Depth to GW:	22.76 feet from PVC
			on June 20, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1							
2			5'	2.5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	0-5'	
3							
4							
5							
6			5'	2.5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, moist, loose. Advance 7? " drill casing to 10', install 6" permanent steel casing to 10', cement grout annular space and remove 7? " casing.	5-10'	
7							
8							
9							
10							
11		Fill					
12			5'	3'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	10-15'	
13							
14							
15							
16			5'	0.5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	15-20'	
17							
18							
19							
20							
21					20-21.5': Fill, as above.		
22		Sand & Gravel	3.5'	3.5'	21.5-22': Sand, f. to c., med brown & gravel, f. to m. wet, loose.	20-23.5'	H-3 = 16,900 pCi/L
23		Till			22-23.5': Till consisting of silt, olive-gray, little clay and f. sand, f. to c. angular gravel, tr. cobbles, unsorted, very dense, dry.		
24							
25					End of Boring at 23.5'		
26					Advance 5½" drill casing to 23.5' to construct well.		

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

	Sandpack		Well Screen		Cement/Bentonite Grout
	Bentonite Seal		Cement/Bentonite Grout and 6-inch Steel Casing		

DRILLING LOG for Well No.:

MW-101A



Yankee Nuclear Power
Station, Rowe, MA

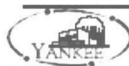
Page 2 of 2

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
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Monitoring Well Construction Details

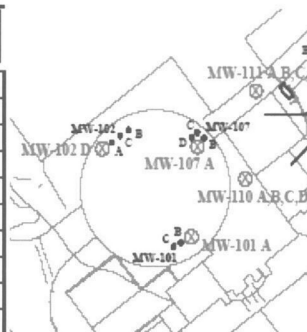
0-8.2': 6-inch Steel Casing Extension Above Grade
 0-8.1': 2-inch PVC Casing Extension Above Grade
 0-10': 6-inch Steel Casing and Cement/Bentonite Grout Below Grade
 0-13': Cement/Bentonite Grout
 13-16': Bentonite Chip Seal
 16-23.5': # 0 (medium) Silica Sand Filter Pack
 0-18': Schedule 40, 2-inch PVC Well Riser
 18-23': Schedule 40, 2-inch PVC, 0.010-inch Slot Well Screen
 23.5': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-102D



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger / Mike Hansen
Date Started:	10-Feb-06	Date Finished:	10-Feb-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	10 feet
Casing Diam:	2 inches	Length:	11 feet
Boring Depth:	22 feet	Well Depth:	21 feet
Surface Elev.:	1133.8 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	8.1 feet
		Slot Size:	0.010 inch
		Type:	Schedule 40 PVC
		Boring Diam.:	10" telescoping to 5½"
		Depth to GW:	23.45 feet from PVC
			on April 18, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1							

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

	Sandpack		Well Screen		Cement/Bentonite Grout
	Bentonite Seal		Cement/Bentonite Grout and 8-inch Steel Casing		

DRILLING LOG for Well No.:

MW-102D



Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 2

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
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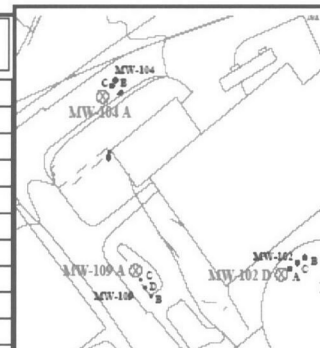
Monitoring Well Construction Details

- 0-8.3': 8-inch Steel Casing Extension Above Grade
- 0-8.1': 2-inch PVC Casing Extension Above Grade
- 0-8': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
- 0-7': Cement/Bentonite Grout Inside 8-inch Casing
- 7-9': Bentonite Chip Seal
- 9-22': # 0 (medium) Silica Sand Filter Pack
- 0-11': Schedule 40, 2-inch PVC Well Riser
- 11-21': Schedule 40, 2-inch PVC, 0.010-inch Slot Well Screen
- 22': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-104A



Yankee Nuclear Power Station
Rowe, Massachusetts



Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger / Mike Hansen
Date Started:	6-Feb-06	Date Finished:	6-Feb-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	10 feet
Casing Diam:	2 inches	Length:	10 feet
Boring Depth:	20 feet	Well Depth:	20 feet
Surface Elev.:	1118.5 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	0 feet
		Slot Size:	0.010 inch
		Type:	Schedule 40 PVC
		Boring Diam.:	10" telescoping to 5½"
		Depth to GW:	8.50 feet from PVC
			on April 18, 2006

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Sand & Gravel	5'	5'	Sand, brown, f. to c. and gravel, f. to c., subangular; some silt; loose, dry.	0-5'	
2							
3							
4							
5							
6		Sand & Gravel	5'	5'	Sand, brown, f. to c. and gravel, f. to c., subangular; some silt; loose, moist. Advance 10" drill casing to 10', install 8" permanent steel casing to 10', cement grout annular space and withdraw 10" drill casing.	5-10'	
7							
8							
9							
10							
11		Sand & Gravel	5'	5'	Sand, brown, f. to c. and gravel, f. to c., subangular; some silt; loose, wet.	10-15'	GW-1: H-3=8,070 pCi/L
12							
13							
14							
15							
16		Till	7'	7'	15-20': Sand, brown, f. to c. and gravel, f. to c., subangular; some silt; loose, wet. Sand and gravel with gray clay from 17 to 17.5'.	15-22'	
17							
18							
19							
20							
21		Till	5'	5'	20-22': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, weathered gneiss cobbles, unsorted, very dense, dry.	22-27'	
22							
23							
24							
25							
26					Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Advance 5½" drill casing to 20' to construct well.		

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Native Soil (collapsed borehole)

Key to Well Construction

Sandpack
 Well Screen
 Cement/Bentonite Grout
 Bentonite Seal
 Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well #:

MW-104A



Power Station,
Rowe, MA

Page 2 of 2

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
27		Till	5'	5'	See Previous Page	22-27'	

Bottom of Boring at 27'

Well Construction Details:

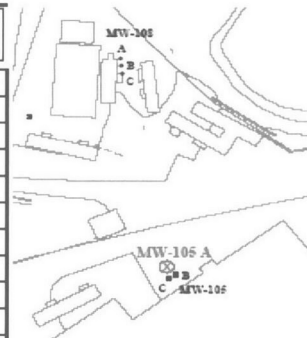
- 0-1': Concrete, Flushmount Roadbox
- 0.5-10': 8" Steel Casing Cement/Bentonite-Grouted in Place
- 1-6': Cement/Bentonite Grout
- 6-8': Bentonite Chip Seal
- 8-21': #0 (medium) Silica Sand Filter Pack
- 0-10': Schedule 40 2" PVC Riser
- 10-20': Schedule 40 2" PVC, 0.010"-Slot Screen
- 21-27': Native Soil (collapsed borehole)
- 27': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-105A



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger / Mike Hansen
Date Started:	8-Feb-06	Date Finished:	8-Feb-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	10 feet
Casing Diam:	2 inches	Length:	10 feet
Boring Depth:	25 feet	Well Depth:	20 feet
Surface Elev.:	1126.9 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	9.9 feet
		Slot Size:	0.010 inch
		Type:	Schedule 40 PVC
		Boring Diam.:	10" telescoping to 5½"
		Depth to GW:	25.95 feet from PVC
			on April 18, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1					0-0.67': Concrete floor slab of former Service Building.		
2			5'	5'		0-5'	
3					0.67-5': Sand, brown, f. to c., some gravel, f. to c., subangular, some silt, few fist-sized cobbles, loose, dry.		
4							
5							
6			5'	5'		5-10'	
7					Sand, brown, f. to c., some gravel, f. to c., subangular, some silt, few fist-sized cobbles, loose, dry. Advance 10" drill casing to 8', install 8" permanent steel casing to 8', cement/bentonite grout annular space and withdraw 10" drill casing.		
8		Sand & Gravel					
9							
10							
11							
12			6'	6'		10-16'	
13					Sand, brown, f. to c., some gravel, f. to c., subangular, some silt, few fist-sized cobbles, loose, dry; moist on bottom. On boulder at 16'.		
14							
15							
16							
17			1'	1'	Schist boulder, pulverized by drill.	16-17'	
18			2'	2'	Schist boulder, pulverized by drill.	17-19'	
19		Boulder					
20			1.5'	1.5'	Schist boulder, pulverized by drill.	19-20.5'	
21					Through boulder at 21'.		
22							
23			4.5'	4.5'		20.5-25'	
24		Till			21-25': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Advance 5½" drill casing to 16' to construct well.		
25							
26					End of Boring at 25 feet		

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Native Soil (collapsed borehole)

Key to Well Construction

Sandpack
 Well Screen
 Cement/Bentonite Grout
 Bentonite Seal
 Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well No.:

MW-105A



Yankee Nuclear Power
Station, Rowe, MA

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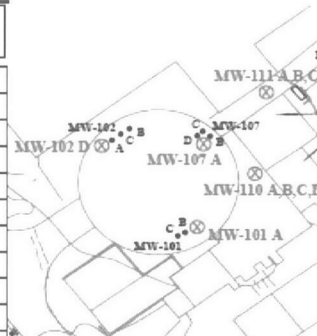
Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
					<p align="center"><u>Monitoring Well Construction Details</u></p> <p>0-10.3': 8-inch Steel Casing Extension Above Grade</p> <p>0-9.9': 2-inch PVC Casing Extension Above Grade</p> <p>0-8': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade</p> <p>0-6': Cement/Bentonite Grout Inside 8-inch Steel Casing</p> <p>6-8': Bentonite Chip Seal</p> <p>8-21': # 0 (medium) Silica Sand Filter Pack</p> <p>0-10': Schedule 40, 2-inch PVC Well Riser</p> <p>10-20': Schedule 40, 2-inch PVC, 0.010-inch Slot Well Screen</p> <p>21-25': Native Soil (collapsed borehole)</p> <p>25': Bottom of Boring</p>		

GEOLOGIST'S LOG for Well #: MW-107A



Yankee Nuclear Power Station
Rowe, Massachusetts

Project: Yankee Ground Water Investigation	Project Number:
Client: Yankee Atomic Electric Company	Logged by: Dave Scott
Drilling Co: Boart Longyear	Driller: Roy Buckenberger / Mike Hansen
Date Started: 5-Apr-06	Date Finished: 5-Apr-06
Location: Rowe, Massachusetts	Drilling Method: Rotosonic
Screen Diam: 2 inches	Length: 5 feet
Casing Diam: 2 inches	Length: 21 feet
Boring Depth: 30 feet	Well Depth: 26 feet
Surface Elev.: 1135.1 feet NAVD '88	MP: Ground Surface
On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137	PVC casing extension above grade: 5.0 feet



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*	
1		Fill	5'	3'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, damp, loose.	0-5'		
2								
3								
4								
5								
6			10'	5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, moist, loose. Advance 10" drill casing to 9.5', install 8" permanent steel casing to 9', cement grout annular space and remove 10" casing.	5-15'		
7								
8								
9								
10								
11			10'	6'	15-24.5': Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	15-25'		
12								
13								
14								
15								
16		Sand & Gravel	5'	4'	24.5-25': Sand, brown, f. to m. and gravel, f. to m., little silt, wet, loose.	GW-1: H-3=7,460 pCi/L		
17								
18								
19								
20								
21			5'	4'	25-26': Sand and gravel, as above.			
22								
23								
24								
25								
26								

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Native Soil (collapsed Borehole)

Key to Well Construction

Sandpack
 Well Screen
 Cement/Bentonite Grout
 Bentonite Seal
 Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well #:

MW-107A


 Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 2

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
27							
28		Till	5'	4'	26-30': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Advance 5½" drill casing to 26' to construct well.	25-30'	
29							
30							

Well Construction Details:

0-5.6': 8-inch Steel Casing Extension Above Grade
 0-5.0': 2-inch PVC Casing Extension Above Grade
 0-9': 8" Steel Casing and Cement/Bentonite Grout Below Grade
 0-16': Portland Cement/Bentonite Grout
 16-19': Bentonite Chip Seal
 19-26': #0 (medium) Silica Sand Filter Pack
 0-21': Schedule 40 2" PVC Riser
 21-26': Schedule 40 2" PVC, 0.010"-Slot Screen
 26-30': Native Soil (collapsed borehole)
 30': Bottom of Boring

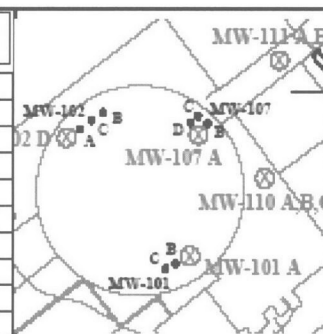
GEOLOGIST'S LOG for Well #: MW-107E



Yankee Nuclear Power Station
Rowe, Massachusetts

Project: Yankee Ground Water Investigation
Client: Yankee Atomic Electric Company
Drilling Co: Boart Longyear
Date Started: 5-May-06
Location: Rowe, Massachusetts
Screen Diam: 2 inches
Casing Diam: 2 inches
Boring Depth: 70 feet
Surface Elev.: 1135.1 feet NAVD '88
On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137

Project Number:
Logged by: Dave Scott
Driller: Mike Hansen
Date Finished: 15-May-06
Drilling Method: Rotosonic
Length: 5 feet
Length: 52 feet
Well Depth: 57 feet
MP: Ground Surface
PVC Casing Extension Above Grade: 5.2 feet
Slot Size: 0.010 inch
Type: Schedule 40, PVC
Boring Diam.: 10" telescoping to 5 1/2"
Depth to GW: 25.60 feet from PVC
on June 19, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Fill	5'	No Sample (see MW-107A)	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, damp, loose.	0-5'	
2							
3							
4							
5							
6			10'	No Sample (see MW-107A)	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, moist, loose.	5-15'	
7							
8							
9							
10							
11							
12							
13							
14							
15							
16			10'	No Sample (see MW-107A)	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	15-25'	
17							
18							
19							
20							
21							
22							
23							
24							
25							
26			5'	4'	See next page.	25-30'	

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

- Sandpack
- Bentonite Seal
- Well Screen
- Cement/Bentonite Grout
- Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well No.:

MW-107E



Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 3

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*
27		Fill			25-28': Fill consisting of silt, dark brown, f. to c. sand and f. to c. gravel, unsorted, loose, wet.		
28							
29			7'	6'	28-32': Till consisting of olive green-gray silt, little clay and f. sand, f. to c. angular gravel, tr fist-sized cobbles of garnet schist, unsorted, very dense, damp.	25-32'	
30		Till					
31							
32					Advance 10-inch drill casing to 32', install 8-inch permanent casing to 32', cement grout annular space and withdraw 10-inch casing.		
33			3'	2.5'	32-34.5': Till, as above, dry. Driller reports drilling got soft at very bottom of sample run.	32-35'	
34		Sand and Silt					
35							
36					34.5-35': Sand, f. to m. and silt, gray-green, unsorted, m. loose, wet. Borehole has ~1' water and collapsed ~1'. Attempted to bail GW sample, but not enough water coming in.		
37		Till	5'	5.5'	35-40': Till as in 32-34.5', dry; except for 1-inch seam of fine sand and gray-green silt, damp, at 37.5 to 37.6'. Advance 7? " drill casing to 40' and pressure grout to seal off water.	35-40'	
38							
39							
40		Sand					
41					40-40.5': Sand, vc., some f. gravel, tr. Silt, olive-gray, unsorted, loose, wet.		
42		Sand and Silt	5'	5'	40.5-44.5': Sand, f. and silt, olive-gray, unsorted, moderately dense, wet; few cobbles @ 42.5-43'. 44.5-45': Till, very dense, dry, as in 32-34.5'. 8' of water in the borehole. Bail GW-1, advance 7? " drill casing to 45' and pressure grout to seal off water.	40-45'	GW-1: H-3=15,200 pCi/L
43							
44							
45							
46		Till	5'	5'	45-49.5': Till, more fine-grained than above, consisting of silt and f. angular gravel; little clay, tr cobbles, unsorted, dense, damp.	45-50'	
47							
48							
49							
50		Silt and Sand			49.5-50': Silt and f. sand, olive-gray, unsorted, mod dense, moist.		
51		Till			50-52': Till consisting of silt, olive-gray, some f. to c. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, dense, dry.		
52		Sand and Gravel	5'	5'	52-52.5': Sand, f. to c. and c. angular gravel, unsorted, loose, wet.	50-55'	GW-2: H-3=4,600 pCi/L
53		Till			52.5-55': Till consisting of silt, olive-gray, some f. to c. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, dense, dry.		
54							
55							
56		Silt and Sand			55-57': Silt and f. sand, with f. angular gravel, little c. gravel, unsorted, dense, moist.		
57			5'	5'	57-60': Till consisting of silt, olive-gray, some f. to c. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, dense, dry. Water entering the borehole: bail GW-2, and advance 5½" drill casing to 60'.	55-60'	
58							
59							
60							
61		Till	5'	4.5'	60-64': Till consisting of silt, olive-gray, some f. to c. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, very dense, dry. 1-inch f. sand layer @ 62', moist.	60-65'	
62							
63							
64					64-65': Clay, olive green, very stiff, some f. to m. angular gravel.		
65			5'	5'	See next page.	65-70'	
66							

DRILLING LOG for Well #:

MW-107E



Yankee Nuclear Power
Station, Rowe, MA

Page 3 of 3

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
67							
68		Till	5'	5'	Till consisting of clay and silt, olive green, some f. to c. sand and f. to c. angular gravel, tr cobbles, unsorted, very dense, dry (more clay-rich than higher up in the section).	65-70'	
69							
70							

Bottom of Boring at 70'

Well Construction Details:

- 0-5.6': 8-inch Steel Casing Extension Above Grade
- 0-5.2': 2-inch PVC Casing Extension Above Grade
- 0-32': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
- 0-46': Portland Cement/Bentonite Grout
- 46-50': Bentonite Chip Seal
- 50-59': #0 (medium) Silica Sand Filter Pack
- 0-52': Schedule 40 2" PVC Riser
- 52'-57': Schedule 40 2" PVC, 0.010"-Slot Screen
- 59-70': Bentonite Chip Seal
- 70': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-107F



Yankee Nuclear Power Station
Rowe, Massachusetts

Project: Yankee Ground Water Investigation

Project Number:

Client: Yankee Atomic Electric Company

Logged by:

Dave Scott

Drilling Co: Boart Longyear

Driller:

Mike Hansen

Date Started: 17-May-06

Date Finished:

23-May-06

Location: Rowe, Massachusetts

Drilling Method:

Rotosonic

Screen Diam: 2 inches

Length: 5 feet

Slot Size: 0.010 inch

Casing Diam: 2 inches

Length: 49 feet

Type: Schedule 40 PVC

Boring Depth: 57 feet

Well Depth: 54 feet

Boring Diam.: 10" telescoping to 5 1/2"

Surface Elev.: 1135.1 feet NAVD '88

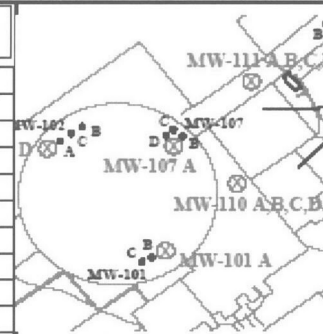
MP: Ground Surface

Depth to GW: 24.37 feet from PVC

On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137

PVC Casing Extension Above Ground: 3.9 feet

on June 19, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Fill	5'	4'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, loose, wet.	0-5'	
2							
3							
4							
5							
6		Fill	10'	6.5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, loose, wet.	5-15'	
7							
8							
9							
10							
11		Till	6'	4'	15-20': Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, loose, wet.	15-21'	
12							
13							
14							
15							
16		Till	4'	4'	20-21': Till consisting of olive-gray silt and f. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, very dense, dry.	21-25'	
17							
18							
19							
20							
21		Till	4'	4'	Till consisting of olive-gray silt and f. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, very dense, dry. Advance 10" drill casing to 25', install 8" permanent steel casing to 25', cement grout the annular space and remove the 10" casing.	25-30'	
22							
23							
24							
25							
26			5'	5'	See next page.		

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted



Native Soil (collapsed borehole)

Key to Well Construction

Sandpack

Well Screen

Cement/Bentonite Grout

Bentonite Seal

Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well No.:

MW-107F



Yankee Nuclear Power
Station, Rowe, MA

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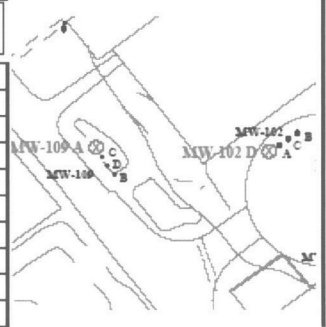
Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*	
27		Till	5'	5'	Till consisting of olive-gray silt and f. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, very dense, dry. Soil core is very hot due to friction from drill action on very dense till.	25-30'		
28								
29								
30			4'	4'	Same as above. 1-inch f. sand seam at 32.5'. 3 inches of vf silty sand at bottom of sample, dry.	30-34'		
31								
32								
33		5'	5'	34-35.5': Boulder. 35.5-36.5': Till, as at 25-30'. 36.5-38': Sand, brown, c. at top, grading to f. at bottom, loose, wet. Borehole collapsed to 37'. 38-39': Till, as at 25-30'. 39-40': Till as above. Collect GW-1, advance 7? " drill casing to 40' and pressure grout.	34-39'	GW-1: H3=44,800 pCi/L		
34								
35								
36		Sand	1'	1'		39-40'		
37								
38		Till	5'	5'	Till consisting of olive-gray silt and f. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, very dense, damp. 4-inch layer of silt @ 44-44.3', moist.	40-45'		
39								
40								
41			5'	5'	Till consisting of olive-gray silt and f. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, very dense, dry.	45-50'		
42								
43								
44		Sand and Gravel	5'	5'	50-52': Sand, f. to m. with subangular gravel, f. to c., little silt, unsorted, dense, wet. 10' of water in the borehole. 52-55': Till consisting of olive-gray silt and f. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, very dense, damp. Advance 5½" drill casing to 55' to construct well.	50-55'	GW-2: H-3=8,790 pCi/L	
45								
46								
47		Till	2'	2'	Till consisting of olive-gray silt and f. sand and f. to c. angular gravel, little clay, tr cobbles, unsorted, very dense, dry.	55-57'		
48								
49								
50		Bottom of Boring at 57 feet						
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64								
65								
66								

GEOLOGIST'S LOG for Well #: MW-109A



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger/Mike Hansen
Date Started:	3-Feb-06	Date Finished:	3-Feb-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	10 feet
Casing Diam:	2 inches	Length:	10 feet
Boring Depth:	20 feet	Well Depth:	20 feet
Surface Elev.:	1124.1 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	3.9 feet



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Sand & Gravel	5'	5'	Sand, brown, f. to vc. and gravel, f. to c., subangular; some silt; loose. Stormwater is entering the borehole because of heavy rain. Unable to identify moisture content of sample.	0-5'	
2							
3							
4							
5							
6							
7		5'	5'	Sand, brown, f. to vc. and gravel, f. to c., subangular; some silt; loose. Stormwater is entering the borehole because of heavy rain. Unable to identify moisture content of sample. Advance 10" drill casing to 8', install 8" permanent steel casing to 8', cement grout annular space and withdraw 10" drill casing.	5-10'		
8							
9		5'	5'	10-12': Sand, brown, m. to c.; little silt, moist. 12-15': Sand, brown, f. to vc. and gravel, f. to c., subangular, some silt, loose, wet.	10-15'		
10							
11							
12							
13	Till	5'	4'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, damp. Advance 5½" drill casing to 20' to construct well.	15-20'		
14							
15							
16							
17							
18							
19	Bottom of Borehole at 20'						
20							
21							
22							
23							
24							
25							
26							

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

Sandpack
 Well Screen
 Cement/Bentonite Grout
 Bentonite Seal
 Cement/Bentonite Grout and 8-inch Steel Casing

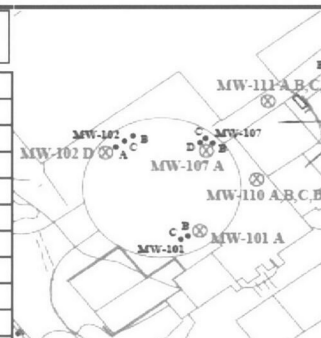
Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
<div style="border: 1px solid black; padding: 10px; margin: 20px auto; width: 80%;"> <p style="text-align: center;"><u>Monitoring Well Construction Details</u></p> <p>0-4.1': 8-inch Steel Casing Extension Above Grade</p> <p>0-3.9': 2-inch PVC Casing Extension Above Grade</p> <p>0-8': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade</p> <p>0-4': Cement/Bentonite Grout Inside 8" Casing</p> <p>4-8': Bentonite Chip Seal</p> <p>8-20': # 0 (medium) Silica Sand Filter Pack</p> <p>0-10': Schedule 40, 2-inch PVC Well Riser</p> <p>10-20': Schedule 40, 2-inch PVC, 0.010-inch Slot Well Screen</p> <p>20': Bottom of Boring</p> </div>							

GEOLOGIST'S LOG for Well #: MW-110A



Yankee Nuclear Power Station
Rowe, Massachusetts

Project: Yankee Ground Water Investigation	Project Number:	
Client: Yankee Atomic Electric Company	Logged by: Dave Scott	
Drilling Co: Boart Longyear	Driller: Roy Buckenberger / Mike Hansen	
Date Started: 15-Feb-06	Date Finished: 16-Feb-06	
Location: Rowe, Massachusetts	Drilling Method: Rotasonic	
Screen Diam: 2 inches	Length: 5 feet	Slot Size: 0.010 inch
Casing Diam: 2 inches	Length: 25 feet	Type: Schedule 40 PVC
Boring Depth: 35 feet	Well Depth: 30 feet	Boring Diam.: 10" telescoping to 5 1/2"
Surface Elev.: 1138.4 feet NAVD '88	MP: Ground Surface	Depth to GW: 19.56 feet from PVC
On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137	PVC casing extension above grade: 5.0 feet	on April 18, 2006



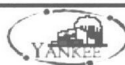
Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Fill	5'	5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, very moist, loose.	0-5'	
2							
3							
4							
5							
6			10'	10'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, moist, loose. Advance 10" drill casing to 10', install 8" permanent steel casing to 10', cement grout annular space and remove 10" drill casing.	5-15'	
7							
8							
9							
10							
11			5'	5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, moist, loose.	15-20'	
12							
13							
14							
15							
16			5'	5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, moist, loose.	20-25'	
17							
18							
19							
20							
21		Sand & Gravel	10'	10'	See next page.	25-35'	See next page
22							
23							
24							
25							
26							

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

Sandpack	Well Screen	Cement/Bentonite Grout
Bentonite Seal	Cement/Bentonite Grout and 8-inch Steel Casing	

DRILLING LOG for Well #:
MW-110A

 Yankee Nuclear Power
Station, Rowe, MA

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Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*	
27		Sand & Gravel	10'	10'	25-29': Sand, brown, f. to c. and gravel, f. to m., some silt, loose, wet.	25-35'	H-3 = 8,040 pCi/L	
28		Till			29-29.5': Gravel, vc, rounded, little silt, loose, wet.			
29	10'		10'	29.5-35': Till consisting of silt, olive-gray, with f. to c. angular gravel, little c. to vc sand, some clay, trace cobbles, unsorted, very dense, dry. Advance 5½" drill casing to 35' to construct well.				
30					Till			
31	10'		10'					
32				Till				
33								Till
34								
35	Till							

Well Construction Details:

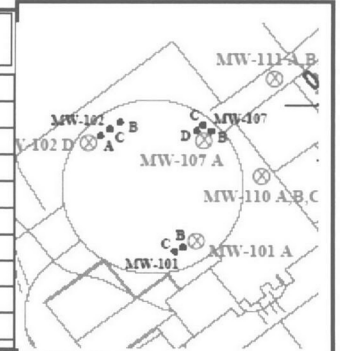
- 0-6.0': 8-inch Steel Casing Extension Above Grade
- 0-5.0': 2-inch PVC Casing Extension Above Grade
- 0-10': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
- 0-17': Cement/Bentonite Grout
- 17-22': Bentonite Chip Seal
- 22-31': #0 (medium) Silica Sand Filter Pack
- 0-25': Schedule 40 2" PVC Riser
- 25-30': Schedule 40 2" PVC, 0.010"-Slot Screen
- 31-35': Bentonite Chip Seal
- 35': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-110B



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger / Mike Hansen
Date Started:	20-Feb-06	Date Finished:	6-Mar-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	10 feet
Casing Diam:	2 inches	Length:	100
Boring Depth:	110 feet	Well Depth:	110
Surface Elev.:	1138.2 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	5.2 feet
			on April 18, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*
1		Fill	12'	12'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	0 to 12'	
2							
3							
4							
5		Fill	3'	3'	Same as Above	12 to 15'	
6							
7							
8							
9		Fill	10'	10'	Same as Above	15 to 25'	
10							
11							
12							
13		Fill	10'	10'	See Next Page	25 to 35'	
14							
15							
16							

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

Sandpack	Well Screen	Cement/Bentonite Grout
Bentonite Seal	Cement/Bentonite Grout and 8-inch Steel Casing	

DRILLING LOG for Well No.:

MW-110B



Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 4

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*
27		Fill	10'	10'	25-31.5': Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	25 to 35'	
28							
29							
30		Sand & Gravel	10'	10'	31.5-33': Sand, brown, f. to m. and f. to c. gravel, some silt, unsorted, medium dense, wet.	25 to 35'	
31					33-35': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, damp.		
32		Till	3'	3'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Advance 10-inch drill casing to 38', install 8-inch permanent casing to 38', cement grout annular space and remove 10-inch casing.	35-38'	
33							
34							
35							
36							
37		Till	2'	2'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	38-40'	
38							
39							
40		Till	5'	5'	Same as Above	40-45'	
41							
42							
43		Till	5'	5'	45-48': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, dense, dry.	45-50'	GW-1: H-3 <2,000 pCi/L
44							
45							
46		Sand & Gravel	5'	5'	48-50': Sand, brown, m. to vc., some f. to m. subround gravel, unsorted, subloose, wet.	45-50'	
47							
48		Till	2'	2'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Advance 7'-inch drill casing to 52' and pressure grout.	50-52'	
49							
50		Sand & Silt	8'	8'	52-53': Till, very dense, dry.	52-60'	GW-2: H-3 <2,000 pCi/L
51					53-55': Sand, m. to c., some silt, gray-green, unsorted, loose, wet.		
52		Till	8'	8'	55-60': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Advance 5½-inch drill casing to 58' and pressure grout.	52-60'	
53							
54							
55		Till	4'	4'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, several fist-sized cobbles, unsorted, very dense, dry. On boulder at 64'	60-64'	
56							
57							
58		Till	6'	6'	See next page.	64-70'	
59							
60							
61							
62							
63							
64							
65							
66							

DRILLING LOG for Well No.:

MW-110B



Yankee Nuclear Power
Station, Rowe, MA

Page 3 of 4

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*
67		Till	6'	6'	Till, very dense, dry. Two or three 2 to 3-foot boulders encountered in this interval (very tough drilling). Ten feet of water in the borehole. Pounding on the boulders apparently caused the grout seal at 58' to fail. Advance 5½-inch drill casing to 65' and pressure grout.	64-70'	
68							
69			2'	2'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, some fist-sized cobbles, unsorted, very dense, dry.	70-72'	
70							
71		Till	6'	6'		72-78'	
72							
73							
74					Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, some fist-sized cobbles, unsorted, very dense, dry. Slightly more sandy at bottom of sample.		
75		Sand & Gravel	6'	6'		78-84'	GW-3: H-3 <2,000 pCi/L
76							
77							
78							
79		Till	10'	8'	78-81': Same as above.	84-94'	GW-4: H-3 <2,000 pCi/L
80							
81					81-83': Sand, brown, f. to c. and gravel, f. to c., subround, unsorted, loose, wet.		
82					83-84': Till consisting of silt, olive-gray, with f. angular gravel, some sand, f., some clay, unsorted, very dense, damp.		
83		Sand & Silt	1.5	0.5	Advance 5½-inch drill casing to 84' and pressure grout.	94-95.5'	
84					84-85.5': Boulder		
85					85.5-88': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, some fist-sized cobbles, unsorted, very dense, dry.		
86					88-88.5': Sand, brown, m. to c., some silt, unsorted, loose, wet.		
87		Till	4.5'	3'	88.5-92': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, some fist-sized cobbles, unsorted, very dense, dry. Weathered schist cobble at 92'.	95.5-100'	
88							
89							
90							
91		Sand & Silt	10'	10'	92-94': Sand, gray and silt, trace f. to m. subangular gravel, unsorted, m. dense, wet. Fragments of weathered schist in bottom 0.5'.	100-110'	GW-5: H-3 <2,000 pCi/L
92							
93							
94							
95		Bedrock	10'	10'	94-95': Same as above. Advance 5½-inch casing to 95' and grout.		
96					95-95.5': Till, as above, very dense, damp.		
97							
98					Albite gneiss, coarse grained, few 2 to 3mm garnets; foliation formed by white, 2 to 5mm thick feldspar-rich layers dips ~ 30 degrees. Soft zone from 96.5 to 97.5'. Many machine breaks caused by reentering borehole after failed attempt to retrieve core. Cored rock with 4-inch core barrel.		
99		Bedrock	10'	10'			
100							
101							
102					Albite gneiss, coarse grained, few 2 to 3mm garnets; foliation formed by white, 2 to 5mm thick feldspar-rich layers dips ~ 30 degrees. Iron-stained fracture at 101'. Another natural fracture in quartz-rich zone with small vugs at 109'. Core is mostly broken into 0.5 to 1-foot machine-broken pieces. One 2.5-foot intact piece from 101 to 103.5 feet.		
103		Bedrock	10'	10'			
104							
105							
106							

DRILLING LOG for Well #:

MW-110B



Yankee Nuclear Power
Station, Rowe, MA

Page 4 of 4

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*
107							
108		Bedrock	10'	10'	See previous page.	100-110'	GW-5: H-3
109							<2,000
110							pCi/L

End of Boring at 110'

Well Construction Details:

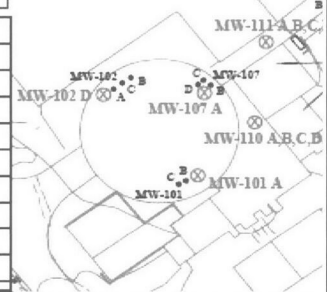
- 0-5.7': 8-inch Steel Casing Extension Above Grade
- 0-5.2': 2-inch PVC Casing Extension Above Grade
- 0-38': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
- 0-93': Portland Cement/Bentonite Grout
- 93-98': Bentonite Chip Seal
- 98-110': #0 (medium) Silica Sand Filter Pack
- 0-100': Schedule 40, 2" PVC Riser
- 100-110': Schedule 40, 2" PVC, 0.010"-Slot Screen
- 110': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-110C



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:			
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott		
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger / Mike Hansen		
Date Started:	8-Mar-06	Date Finished:	20-Mar-06		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2 inches	Length:	5 feet	Slot Size:	0.010 inch
Casing Diam:	2 inches	Length:	46 feet	Type:	Schedule 40 PVC
Boring Depth:	51 feet	Well Depth:	51 feet	Boring Diam.:	10" telescoping to 5 1/2"
Surface Elev.:	1138.0 feet NAVD '88	MP:	Ground Surface	Depth to GW:	27.51 feet from PVC
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	5.4 feet		on April 18, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12			25'	No sample: see log of MW-110B	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	0-25'	
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25			10'	7'	See next page.	25-35'	
26							

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

Sandpack	Well Screen	Cement/Bentonite Grout
Bentonite Seal	Cement/Bentonite Grout and 8-inch Steel Casing	

DRILLING LOG for Well No.:

MW-110C



Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 2

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*			
27		Fill	10'	7'	25-30': Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	25-35'				
28										
29		Till	3'	3'	30-35': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Boulder at 34-35'.	35-38'				
30										
31										
32										
33		Sand	2'	2'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Boulder at 39-40'.	38-40'				
34										
35										
36										
37		Till	5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, damp; few 2 to 3-inch silty layers that drilled easier.	40-45'				
38										
39		Sand	6'	6'	45-47': Till as above.	45-51'	H-3<2,000 pCi/L			
40										
41		Till			47-50.5': Sand, brown, f. to m. some silt, unsorted, medium dense, wet. Advance 5½-inch casing to 51 feet to construct well.					
42										
43		Till			50.5-51': Till as above.					
44										
45										
46										
47										
48										
49										
50										
51										
52										

Monitoring Well Construction Details

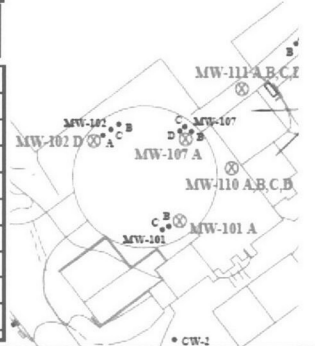
- 0-6.2': 8-inch Steel Casing Extension Above Grade
- 0-5.4': 2-inch PVC Casing Extension Above Grade
- 0-38': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
- 38-44': Bentonite Chip Seal
- 44-51': # 0 (medium) Silica Sand Filter Pack
- 0-46': Schedule 40, 2-inch PVC Well Riser
- 46-51': Schedule 40, 2-inch PVC, 0.010-inch Slot Well Screen
- 51': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-110D



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:			
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott		
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger / Mike Hansen		
Date Started:	9-Mar-06	Date Finished:	17-Mar-06		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2 inches	Length:	5 feet	Slot Size:	0.010 inch
Casing Diam:	2 inches	Length:	83 feet	Type:	Schedule 40 PVC
Boring Depth:	90 feet	Well Depth:	88 feet	Boring Diam.:	10" telescoping to 5 1/2"
Surface Elev.:	1137.7 feet NAVD '88	MP:	Ground Surface	Depth to GW:	49.36 feet from PVC
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	5.7 feet		on April 18, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
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							
26							
		Fill	25'	No sample: see log for MW-110B	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	0-25'	
			8'	7'	25-26': Fill, as above.	25-33'	

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Native Soil (collapsed borehole)

Key to Well Construction

Sandpack
 Well Screen
 Cement/Bentonite Grout
 Bentonite Seal
 Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well No.:

MW-110D



Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 3

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*
27		Sand & Gravel	8'	7'	26-29.5': Sand, brown, f. to c. and gravel, f. to m., subround, some silt, unsorted, loose, wet.	25-33'	
28							
29		Till	8'	7'	29.5-33': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Advance 10-inch drill casing to 33', install 8-inch permanent casing, cement grout annular space and remove 10-inch casing.	25-33'	
30							
31		Boulder	11'	9'	33-36': Boulder.	33-44'	
32							
33		Till	11'	9'	36-44': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. One 2-inch f. sand layer at 42.5'.	33-44'	
34							
35		Sand & Gravel	6'	6'	44-46.5': Sand, brown, f. to vc, some f. gravel, poorly sorted, medium dense, wet.	44-50'	
36					46.5-47': Silt, olive, with f. angular gravel, unsorted, dense, moist.		
37		Till	6'	6'	47-50': Till consisting of silt, olive-gray, with f. to c. angular gravel, some cobbles, some sand, f. to m., some clay, unsorted, dense, dry. Advance 7? -inch drill casing to 50' and pressure grout.	44-50'	
38							
39		Sand & Gravel	5'	4'	51-52': Sand, vc and vf gravel, little silt, unsorted, loose, wet.	50-55'	
40					52-54.5': Sand, f. to m., some silt, olive-green, tr cobbles, unsorted, m. dense, wet.		
41		Till	5'	4'	54.5-55': Till, as above, v dense, dry. Advance 7? " casing to 55' & grout.	50-55'	
42							
43		Sand	7'	7'	55-56': Sand, f. to m., loose, wet.	55-62'	GW-1: H-3<2,000 pCi/L
44					56-58': Till, as above, very dense, dry.		
45		Till	7'	7'	58-62': Till, with few 3 to 6-inch layers of c. sand and gravel, poorly sorted, dense, moist. 11' of water in the borehole - will drill ahead to 65', then advance 7? " drill casing to 65' and pressure grout.	55-62'	
46							
47		Till	3'	3'	62-63': Till, as 56-58'; very dense, dry.	62-65'	
48					63-65': Till, more coarse-grained than above, with vc sand, poorly sorted, loose, moist.		
49		Till	4'	4'	See next page.	65-69'	
50							


DRILLING LOG for Well No.:

MW-110D



Yankee Nuclear Power
Station, Rowe, MA

Page 3 of 3

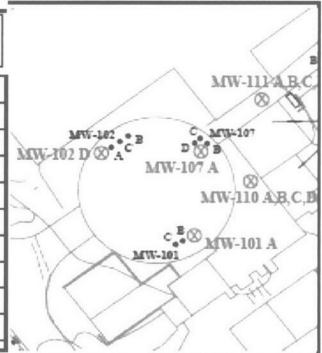
Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*		
67		Till	4'	4'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	65-69'			
68									
69		Till	4'	4'	Till, more coarse-grained than above, with vc sand, poorly sorted, loose, dry. 1-foot boulder from 72-73'.	69-73'			
70									
71									
72		Boulder							
73		Till	7'	7'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	73-80'			
74									
75									
76									
77									
78									
79									
80			Sand & Gravel	5'	5'	80-82': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. 82-82.5': Sand, m. to c., some gravel, f. to m., tr silt, loose, moist. 82.5-84.5': Till, as above; top foot more sandy, medium dense. 84.5-85': Sand, m. to c., some gravel, f. to m., tr silt, loose, wet.	80-85'	H-3<300 pCi/L	
81									
82									
83		Till							
84		Sand & Gravel	5'	5'	85-88': Sand, m. to vc and gravel, f. to m., trace silt, unsorted, loose, wet. Advance 5½" drill casing to 88' to construct well.	85-90'			
85									
86									
87									
88	Till			88-90': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. On boulder at 90'.					
89									
90									

GEOLOGIST'S LOG for Well #: MW-111A



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger / Mike Hansen
Date Started:	30-Mar-06	Date Finished:	30-Mar-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	5 feet
Casing Diam:	2 inches	Length:	18 feet
Boring Depth:	23 feet	Well Depth:	23 feet
Surface Elev.:	1134.8 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	6.2 feet



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Fill	5'	4'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, damp, loose.	0-5'	
2							
3							
4							
5							
6			5'	5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, moist, loose. Advance 10" drill casing to 8', install 8" permanent steel casing, grout annular space and remove 10" casing.	5-10'	
7							
8							
9							
10							
11		5'	4'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet at bottom, loose.	10-15'		
12							
13							
14							
15							
16		3'	3'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose. On boulder at 18'.	15-18'	GW-1: H-3=5,480 pCi/L	
17							
18		2'	2'	Boulder	18-20'		
19							
20							
21		Sand &Gravel	3'	3'	20-21': Sand, f. to c., gravel, f. to c.and silt, unsorted, loose, wet.	20-23'	
22		Till			21-23': Till consisting of olive-gray silt, little clay and f. sand, f. to c. angular gravel, tr. fist-sized cobbles, unsorted, very dense, moist. Advance 7? " drill casing to 23' to construct well.		
23		Bottom of Boring at 23'					

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

Sandpack	Well Screen	Cement/Bentonite Grout
Bentonite Seal	Cement/Bentonite Grout and 8-inch Steel Casing	

DRILLING LOG for Well No.:

MW-111A



Yankee Nuclear Power
Station, Rowe, MA

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Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
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Monitoring Well Construction Details

0-6.7': 8-inch Steel Casing Extension Above Grade
 0-6.2': 2-inch PVC Casing Extension Above Grade
 0-8': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
 0-12': Cement/Bentonite Grout
 12-15.5': Bentonite Chip Seal
 15.5-23': # 0 (medium) Silica Sand Filter Pack
 0-18': Schedule 40, 2-inch PVC Well Riser
 18-23': Schedule 40, 2-inch PVC, 0.010-inch Slot Well Screen
 23': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-111B

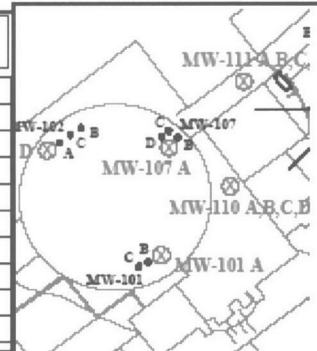


Yankee Nuclear Power Station
Rowe, Massachusetts

Project: Yankee Ground Water Investigation
Client: Yankee Atomic Electric Company
Drilling Co: Boart Longyear
Date Started: 21-Mar-06
Location: Rowe, Massachusetts
Screen Diam: 2 inches
Casing Diam: 2 inches
Boring Depth: 80 feet
Surface Elev.: 1138.2 feet NAVD '88
On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137

Project Number:
Logged by: Dave Scott
Driller: Roy Buckenberger / Mike Hansen
Date Finished: 28-Mar-06
Drilling Method: Rotosonic
Length: 10 feet
Length: 70 feet
Well Depth: 80 feet
MP: Ground Surface
PVC Casing Extension Above Grade: 6.0 feet

Slot Size: 0.010 inch
Type: Schedule 40, PVC
Boring Diam.: 10" telescoping to 4"
Depth to GW: 35.25 feet from PVC
on April 18, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Fill	5'	5'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, dry, loose.	0-5'	
2							
3							
4							
5							
6			10'	4'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, dry to wet, loose.	5-15'	
7							
8							
9							
10							
11			10'	10'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, dry to wet, loose.	15-25'	
12							
13							
14							
15							
16		Till	3'	3'	See next page.	25-28'	
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Sandpack
 Well Screen
 Cement/Bentonite Grout
 Bentonite Seal
 Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well No.:

MW-111B



Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 3

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*			
27		Till	3'	3'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	25-28'				
28			2'	2'	Till, Same as Above	28-30'				
29										
30		Till	5'	4'	Advance 10-inch drill casing to 30'. Install 8-inch permanent casing to 30', cement grout annular space and remove 10-inch casing.	30-35'				
31										
32									Till, Same as Above	
33		Silty Sand	5'	5'	35-37': Sand, brown, f. to m., little silt, unsorted, m. dense, wet.	35-40'	GW-1 H-3=2,360 pCi/L			
34					Till		37-39.75': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. 39.75-40': Silt, gray-brown and sand, f., unsorted, m. dense, damp.			
35		Silty Sand								GW-2: H-3<2,000
36		Till	5'	7'	Advance 7? " drill casing to 38' and pressure grout.	40-45'				
37									Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Boulder 43-44.5'.	
38										
39		Till	5'	7'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	45-50'				
40										
41										
42		Till	5'	7'	Same as above, few 6-inch boulders.	50-55'				
43										
44										
45		Till	5'	7'	Same as above. Several feet of water in the borehole, probably from a small sand seam that was missed around 40'. Water has been following the drill down the hole since then (note 2' of slough in each sample since 40'). Collect GW-2, advance 5½-inch drill casing to 55' and pressure grout.	55-60'				
46										
47										
48		Silty Sand	5'	5'	60-63.6': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	60-65'	GW-3: H-3<2,000 pCi/L			
49									63.6-64': Silt and sand, f. to m., moist.	
50									64-65': Rock, pulverized, possible top of bedrock.	
51		Bedrock	1'	1'	V. hard drilling. Probable bedrock. Will drill with water to core Rx.	65-66'				
52										
53										
54										
55										
56										
57										
58										
59										
60										
61										
62										
63										
64										
65										
66										

DRILLING LOG for Well #:

MW-111B



Yankee Nuclear Power
Station, Rowe, MA

Page 3 of 3

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
67							
68							
69							
70							
71							
72							
73		Bedrock	14'	8.5'	Albite gneiss, m. to c.-grained with 2 to 5mm megacrystals of albite. Other predominant minerals are quartz and biotite. Quartz and albite layers 3 to 5mm thick form foliation dipping ~ 30 degrees. Drilling is soft to ~73'. No return of coring water until ~73' due to fractures taking water. Only two 1-foot pieces of intact core. Most of core is machine broken into 6-inch or less pieces. One iron-stained natural fracture at 79'; other possible natural fractures at 71, 77 and 78 feet. Cored rock with 4-inch core barrel.	66-80'	GW-4: H-3<2,000 pCi/L
74							
75							
76							
77							
78							
79							
80							

End of Boring at 80 feet

Well Construction Details:

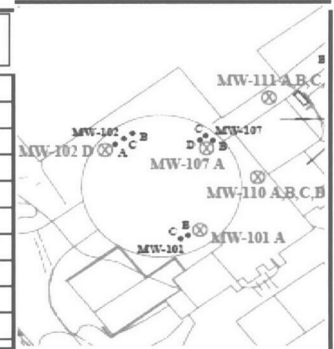
- 0-6.4': 8-inch Steel Casing Extension Above Grade
- 0-6.0': 2-inch PVC Casing Extension Above Grade
- 0-30': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
- 0-62': Portland Cement/Bentonite Grout
- 62-67': Bentonite Chip Seal
- 67-80': #0 (medium) Silica Sand Filter Pack
- 0-70': Schedule 40 2" PVC Riser
- 70-80': Schedule 40 2" PVC, 0.010"-Slot Screen
- 80': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-111C



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	Boart Longyear	Driller:	Roy Buckenberger / Mike Hansen
Date Started:	29-Mar-06	Date Finished:	31-Mar-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	5 feet
Casing Diam:	2 inches	Length:	32 feet
Boring Depth:	40.5 feet	Well Depth:	37 feet
Surface Elev.:	1134.8 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	5.8 feet
		Slot Size:	0.010 inch
		Type:	Schedule 40 PVC
		Boring Diam.:	10" telescoping to 5 1/2"
		Depth to GW:	21.85 feet from PVC
			on April 18, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Fill	5'	4'	Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, damp, loose.	0-5'	
2							
3							
4							
5							
6		Fill	8'	4'	5-12.5': Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, damp, loose.	5-13'	
7							
8							
9							
10							
11		Boulder	2'	0.5'	12.5-13': Sand, brown, f. to m; some f. subround gravel, unsorted, dry, loose. On boulder at 13'.	13-15'	
12					13-13.5': Garnet schist boulder.		
13					13.5-15': No recovery due to overlying boulder. Drilled easy.		
14		Fill	10'	9'	15-22': Fill, dark brown, consisting of silt and sand, f. to c.; some gravel, f. to c., and cobbles; trace roots and wood, trace Mirafi cloth; unsorted, wet, loose.	15-25'	
15							
16							
17							
18							
19		Sand & Gravel			22-24': Sand, f. to c., gravel, f. to c. and silt, unsorted, loose, wet.		
20							
21		Till			24-25': Till, very dense, damp; see description below.		
22							
23							
24							
25							
26							
			5'	5'	See next page.	25-30'	

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Native Soil (collapsed borehole)

Key to Well Construction

Sandpack
 Well Screen
 Cement/Bentonite Grout
 Bentonite Seal
 Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well No.:

MW-111C



Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 2

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*
27		Till	5'	5'	Till consisting of olive-gray silt, little clay and f. sand, f. to c. angular gravel, tr. fist-sized cobbles, unsorted, very dense, dry. Advance 10" drill casing to 29', install 8" permanent steel casing, grout annular space and remove 10" casing.	25-30'	
28							
29		Till	5'	5'	Till consisting of olive-gray silt, little clay and f. sand, f. to c. angular gravel, tr. fist-sized cobbles, unsorted, very dense, dry.	30-35'	H-3<300 pCi/L
30							
31							
32		Sand			35-36': Sand, brown, f. to m., little silt, unsorted, m. dense, wet.		
33							
34		Till	5.5'	5'	36-40.5': Till consisting of olive-gray silt, little clay and f. sand, f. to c. angular gravel, trace fist-sized cobbles, unsorted, very dense, dry. Advance 5½" drill casing to 37 feet to construct well.	35-40.5'	
35							
36							
37							
38							
39							
40							
41							

Bottom of Borehole at 40.5'

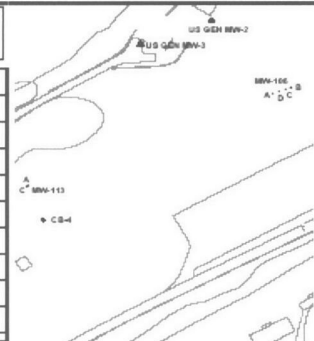
Monitoring Well Construction Details

- 0-6.2': 8-inch Steel Casing Extension Above Grade
- 0-5.8': 2-inch PVC Casing Extension Above Grade
- 0-29': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
- 0-26': Cement/Bentonite Grout Inside 8-inch Steel Casing
- 26-30': Bentonite Chip Seal
- 30-37': # 0 (medium) Silica Sand Filter Pack
- 0-32': 2-inch, Schedule 40 PVC Well Riser
- 32-37': 2-inch, Schedule 40 PVC, 0.010-inch Slot Well Screen
- 37-40.5': Native Soil (collapsed borehole)
- 40.5': Bottom of Borehole

GEOLOGIST'S LOG for Well #: MW-113A



Yankee Nuclear Power Station
Rowe, Massachusetts



Project: Yankee Ground Water Investigation	Project Number:	
Client: Yankee Atomic Electric Company	Logged by: Dave Scott	
Drilling Co: Boart Longyear	Driller: Mike Hansen	
Date Started: 27-Apr-06	Date Finished: 27-Apr-06	
Location: Rowe, Massachusetts	Drilling Method: Rotasonic	
Screen Diam: 2 inches	Length: 10 feet	Slot Size: 0.010 inch
Casing Diam: 2 inches	Length: 15 feet	Type: Schedule 40 PVC
Boring Depth: 25 feet	Well Depth: 25 feet	Boring Diam.: 10" telescoping to 5 1/2"
Surface Elev.: 1083.2 feet NAVD '88	MP: Ground Surface	Depth to GW: 20.50 feet from PVC
On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade: 1.5 feet	on June 26, 2006

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No. *
1		Sandy Loam			0-2': Sand, brown, f. to m. and silt, with organic material.		
2			5'	4'		0-5'	
3					2-5': Sand, brown, f. to m. and gravel, m. to c., subangular, with silt, unsorted, loose, dry, no odor.		
4							
5		Septic System Leachfield (Sand & Gravel)					
6			5'	5'	5-7.5': Sand, brown, f. to m. and gravel, m., subangular, with silt, unsorted, loose, dry, no odor.	5-10'	
7					7.5-8.5': Sand, lt. brown, m. to c., well sorted, loose, moist, no odor.		
8					8.5-9.5': Gravel, m. to c., well sorted, loose, wet, no odor. 9.5-10': Sand, dk. brown, f., tr. m. gravel & silt, unsorted, loose, wet, no odor.		
9							
10			5'	5'	Advance 10" drill casing to 8', install 8" permanent steel casing to 8', cement grout annular space and remove 10" casing. 10-15': Sand, f. to vc., lt. brown, and gravel, f. to c., subround, tr silt, tr cobbles, poorly sorted, loose, damp, no odor.	10-15'	
11							
12							
13							
14							
15							
16							
17		Sand & Gravel	5'	5'	15-18': Gravel, f. to c., subround to round, trace c. to vc. sand, poorly sorted, loose, wet, no odor.	15-20'	
18					18-19': Sand, brown, f. to m., some silt, with m. to c. gravel, poorly sorted, loose, moist, no odor.		
19					19-20': Sand, brown, c. to vc, well sorted, loose, wet, no odor.		
20							
21					20-22': Sand, vc., some m. to c. subround gravel, tr silt, poorly sorted, loose, wet.		
22			5'	5'	22-24': Sand, gray, f., and c. angular gravel and silt, unsorted, m. dense, wet.	20-25'	
23					24-25': Sand, brown, f. to c. and gravel, f. to m., subround, with silt, unsorted, loose, wet. Advance 5 1/2" drill casing to 25'.		
24							
25							
Bottom of Borehole at 25'							

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

Sandpack
 Well Screen
 Cement/Bentonite Grout
 Bentonite Seal
 Cement/Bentonite Grout and 8-inch Steel Casing

DRILLING LOG for Well No.:

MW-113A



Yankee Nuclear Power
Station, Rowe, MA

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Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
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Monitoring Well Construction Details

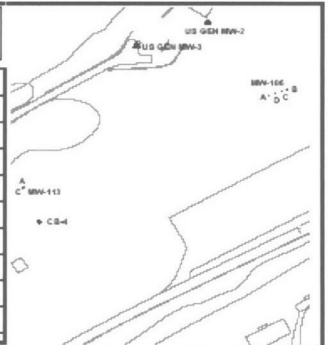
0-1.8': 8-inch Steel Casing Extension Above Grade
0-1.5': 2-inch PVC Casing Extension Above Grade
0-8': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade
0-7.5': Cement/Bentonite Grout Inside 8-inch Steel Casing
7.5-13': Bentonite Chip Seal
13-25': # 0 (medium) Silica Sand Filter Pack
0-15': Schedule 40, 2-inch PVC Well Riser
15-25': Schedule 40, 2-inch PVC, 0.010-inch Slot Well Screen
25': Bottom of Boring

GEOLOGIST'S LOG for Well #: MW-113C



Yankee Nuclear Power Station
Rowe, Massachusetts

Project:	Yankee Ground Water Investigation	Project Number:	
Client:	Yankee Atomic Electric Company	Logged by:	Dave Scott
Drilling Co:	Boart Longyear	Driller:	Mike Hansen
Date Started:	11-Apr-06	Date Finished:	26-Apr-06
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic
Screen Diam:	2 inches	Length:	10 feet
Casing Diam:	2 inches	Length:	127 feet
Boring Depth:	140 feet	Well Depth:	137 feet
Surface Elev.:	1083.2 feet NAVD '88	MP:	Ground Surface
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	PVC Casing Extension Above Grade:	1.6 feet
		Slot Size:	0.010 inch
		Type:	Schedule 40, PVC
		Boring Diam.:	10" telescoping to 5 1/2"
		Depth to GW:	54.72 feet from PVC
			on June 14, 2006



Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
1		Sandy Loam			0-2': Sand, brown, f. to m. and silt, with organic material.		
2			5'	4'		0-5'	
3					2-5': Sand, brown, f. to m. and gravel, m. to c., subangular, with silt, unsorted, loose, dry, no odor.		
4							
5		Septic System Leachfield (Sand & Gravel)					
6			5'	5'	5-7.5': Sand, brown, f. to m. and gravel, m., subangular, with silt, unsorted, loose, dry, no odor.	5-10'	
7					7.5-8.5': Sand, lt. brown, m. to c., well sorted, loose, moist, no odor.		
8					8.5-9.5': Gravel, m. to c., well sorted, loose, wet, no odor. 9.5-10': Sand, dk. brown, f., tr. m. gravel & silt, unsorted, loose, wet, no odor.		
9							
10							
11			5'	5'	Sand, f. to vc., lt. brown, and gravel, f. to c., subround, tr. Silt, tr. Cobbles, poorly sorted, loose, damp, no odor.	10-15'	
12							
13							
14							
15							
16			5'	5'	15-18': Gravel, f. to c., subround to round, trace c. to vc. sand, poorly sorted, loose, wet, no odor.	15-20'	
17							
18		Sand & Gravel			18-19': Sand, brown, f. to m., some silt, with m. to c. gravel, poorly sorted, loose, moist, no odor.		
19					19-20': Sand, brown, c. to vc, well sorted, loose, wet, no odor.		
20							
21			5'	5'	20-22': Sand, vc., some m. to c. subround gravel, tr. Silt, poorly sorted, loose, wet.	20-25'	GW-1: H-3 <2,000 pCi/L
22					22-24': Sand, gray, f., and c. angular gravel and silt, unsorted, m. dense, wet.		
23					24-25': Sand, brown, f. to c. and gravel, f. to m., subround, with silt, unsorted, loose, wet.		
24							
25							
26			5'	5'	See next page.	25-30'	

NOTES:

*Results of on-site radiological screening <MDL unless otherwise noted

Key to Well Construction

Sandpack	Well Screen	Cement/Bentonite Grout
Bentonite Seal	Cement/Bentonite Grout and 8-inch Steel Casing	

DRILLING LOG for Well No.:

MW-113C



Yankee Nuclear Power
Station, Rowe, MA

Page 2 of 5

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*
27		Sand & Gravel			25-27': Same as 24-25'.		GW-1
28			5'	5'	27-30': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	25-30'	
29							
30							
31			5'	5'	Advance 10-inch drill casing to 30', install 8-inch permanent casing, cement grout the annular space and withdraw the 10-inch casing.	30-35'	
32							
33					30-35': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.		
34							
35							
36			5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	35-40'	
37							
38							
39							
40							
41			5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	40-45'	
42							
43							
44							
45			5'	5'	45-47': Till consisting of silt, olive-gray, with f. to c. angular gravel, more clay than above, unsorted, very dense, damp.	45-50'	
46							
47							
48					47-50': Till, same as 40-45', dry, but damp at 50'.		
49							
50							GW-2: H-3<2,000 pCi/L
51			5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. 52-53' is more clay-rich. Little water at the top of the sample, coming from 50'. Water enters the borehole very slowly (0.6' in 7 minutes). Collect GW-2, advance 5½-inch drill casing to 55' and pressure grout to seal off the water-bearing zone.	50-55'	
52							
53							
54							
55							
56			5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	55-60'	
57							
58							
59							
60							
61			5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Sample is very hot due to friction from drill action on extremely dense till.	60-65'	
62							
63							
64							
65			5'	5'	See next page.	65-70'	
66							

DRILLING LOG for Well No.:

MW-113C



Yankee Nuclear Power
Station, Rowe, MA

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Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth (feet)	Ground Water Sample No.*			
67		Till	5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry. Sample is very hot due to friction from drill action on extremely dense till.	65-70'				
68										
69				Silty Clay	5'	5'		70-73': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	70-75'	
70										73-75': Silty clay, olive-gray, very stiff, with vf. Sand in 1-2mm lamellae; trace f. to m. angular gravel, increasing clay content with depth, damp.
71			Till		5'	5'		75-78': Same as 73 to 75'; very clayey on top, more silty with depth.	75-80'	
72										78-80': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.
73				Till	5'	5'		Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	80-85'	
74										
75			Till		5'	5'		Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	85-90'	
76										
77				Till	5'	5'		Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	90-95'	
78										
79			Till		5'	5'		Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	95-100'	
80										
81				Sand	5'	5'		100-103': Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, dry.	100-105'	
82										103-103.25': Sand, m., medium dense, moist.
83			Till		5'	5'		103.25-105': Same as 100-103'.		105-110'
84										
85				Till	5'	5'				
86										
87										
88										
89										
90										
91										
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106										


DRILLING LOG for Well No.:

MW-113C



Yankee Nuclear Power
Station, Rowe, MA

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Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*	
107		Till	5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, moist. The borehole sat open from 95' overnight and 28' of water entered by morning from sand at 103'. Collect ground water sample GW-3.	105-110'	GW-4: H-3<2,000 pCi/L	
108								
109				5'	5'	Till consisting of silt, olive-gray, with f. to c. angular gravel, some sand, f. to m., some clay, trace cobbles, unsorted, very dense, moist. Moisture is probably from water from 103' sitting in the hole all night. Advance 5½-inch drill casing to 115' and pressure grout to seal off water.		110-115'
110								
111								
112								
113								
114			5'	5'	115-117': Till with more clay than above.	115-120'		
115								
116								
117								
118								
119			Glaciolacustrine Silt and Clay	5'	5'	Clay and silt, olive green, laminated, very stiff, tr. Sand, f. and f. angular gravel, moist.		120-125'
120								
121								
122								
123								
124			5'	5'	125-128': Clay and silt, olive green, laminated, very stiff, tr. Sand, f. and f. angular gravel, moist.	125-135'		
125								
126								
127								
128								
129		Glaciolacustrine Sand	10'	10'	128-135': Sand, gray-green, f. to m. and silt, tr. Gravel, m. to c., unsorted, dense, wet. 53' of water came into the borehole overnight. Collect ground water sample GW-4 and advance 5 1/2-inch drill casing to 135'.	135-140'		
130								
131								
132								
133								
134		Till	5'	1'	Till consisting of silt, olive-gray, with sand, f. to m. and f. to c. angular gravel, some clay, trace cobbles, unsorted, very dense, dry. Drilled very hard.			
135								
136								
137								
138								
139		End of Boring at 140 feet						
140								

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	Ground Water Sample No.*
<div><p><u>Well Construction Details</u></p><div><p>0-1.9': 8-inch Steel Casing Extension Above Grade</p><p>0-1.6': 2-inch PVC Casing Extension Above Grade</p><p>0-30': 8-inch Steel Casing and Cement/Bentonite Grout Below Grade</p><p>0-120': Portland Cement/Bentonite Grout</p><p>120-125': Bentonite Chip Seal</p><p>125-140': # 0 (medium) Silica Sand Filter Pack</p><p>0-127': Schedule 40, 2" PVC Riser</p><p>127-137': Schedule 40, 2" PVC, 0.010"-Slot Screen</p><p>140': Bottom of Borehole</p></div></div>							