170 Waukewan Street
Meredith, N.H. 03253
Phone (603) 279-4425
FAX # 603-279-8717

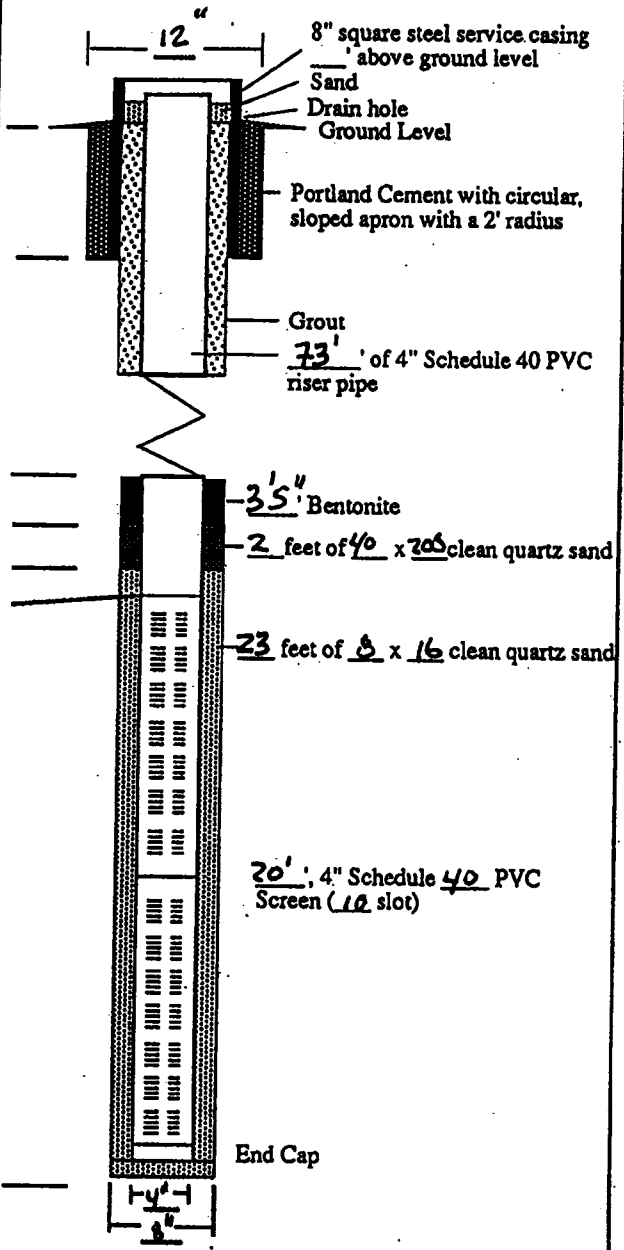
Emery & Garrett Groundwater Inc.

Project: Loudoun Landfill
Driller: Groundwater Systems
Geologist: John Brooks
DNR Observer: Mike Fairbanks
Well: ~~MW 27~~ L5.

Date Drilled: 8/12/92
Depth to Bedrock: NA
Total Depth of Well (g.l.): 90'
Static Water Level: 52.53' (8/18/92)
Ground Elevation: 385'

Monitoring Well MW 25 "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)	Construction Details	Well Construction



Material Used

Volume of Grout 12
(# of 94 lb bags)

Volume of Bentonite 2
(# of 50 lb container)

Volume of 40 x 200 sand 1
(# of 50 lb bags)

Volume of 8 x 16 sand 6.5
(# of 100 lb bags)

Splitspoon Samples

15 bagged samples
received by Mike Fairbanks

Development

Pump rate 10 gpm
Time pumped 16 periods
Comments: & surging & pumping (Emery)
Still a little cloudy

Development OK by
Richard Ryan
15 SURGES
(printed name)
Date 9/24/92

Construction Ok by Richard Ryan
(printed name)
Date 8/21/92

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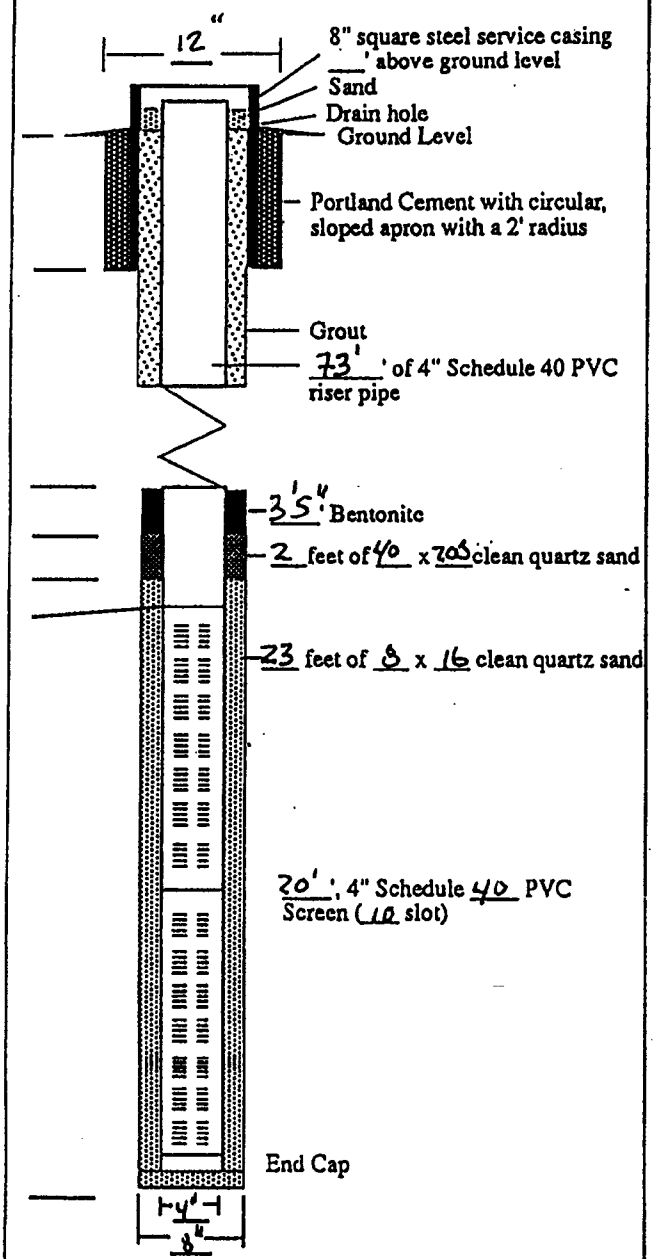
Emery & Garrett Groundwater Inc.

Project: Loudoun Landfill
Driller: Groundwater Systems
Geologist: John Brooks
DNR Observer: Mike Fairbanks
Well: ~~MW-27~~ L5

Date Drilled: 8/12/92
Depth to Bedrock: NA
Total Depth of Well (g.l.): 90'
Static Water Level: 52.53' (8/18/92)
Ground Elevation: 385'

Monitoring Well MW 25 "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)	Construction Details	Well Construction



Material Used

Volume of Grout 12
(# of 94 lb bags)

Volume of Bentonite 2
(# of 50 lb container)

Volume of 40 x 200 sand 2.1
(# of 50 lb bags)

Volume of 8 x 16 sand 6.5
(# of 100 lb bags)

Splitspoon Samples

15 bagged samples
received by Mike Fairbanks

Development

Pump rate _____

Time pumped _____

Comments:

Development OK by

_____

_____
(printed name)

Date _____

Construction Ok by Richard Ryan
(printed name) _____
Date 8/21/92

EGGI BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems | WELL NUMBER: L5 | DATE: 8/12/92

TYPE OF DRILLING RIG: Air Rotary | GEOLOGIST: John Brooks | ELEVATION: ~385

Depth to base of splitspoon (feet)	Thickness (in.)	% Recovery	Rock Type (See codes)	Color #	USCS Code	Moisture content	Grain Size Matrix: %cly,slt,snd	Conglom. Struct % Clasts	% Wthrd	Description
		18" spoon								
5	18	100	SLP-Cng	10R6/6		MOIST-DRY	15, 80, 5	40	95	clasts ≤ 3 cm
10	18	100	"	10R4/6		"	"	40	90	clasts ~5 cm. to 5 mm
15	16	90	"	10R4/6		"	20, 70, 10	45	90	"
22.5	18	100	"	"		"	"	40	95	
25	17	95	"	"		"	"	50	95	3 or 4 large GS/ST clasts the width of tube
27.5	16	90	"	10R4/6		"	25, 70, 5	25	98	coarse-grained SS to conglomerate
30	14	80	"	"		"	"	55	90	
32.5	~2	10	"	"		"	"	50	50 →	1 large clast of qtz = 50% of sample
35	16	90	"	"		"	"	40	95	
37.5	12	70	"	"		"	"	60	95	
40'										Shelby tube smashed no recovery
42	6"	35	"	"		"		—	~95	Splitspoon with brass liner - sample analyzed
45	6"	35	"	"		"		—	~95	" " - extra sample
52	14	80	"	"		"	"	65	98	Drilling dust in 1-2 cm clumps
57	18	100	"	10R4/6-5YR3/4		"	"	30	98	Drilling dust in 3-7 cm clumps
62	14	80	"	5YR3/4		DAMP	"	30	95	very clumpy drilling "dust"
67	16	90	"	5YR3/4		DAMP	"	50	95	mud on bottom 2½' of rod cutters/splitspoon sampling
72	14	80	"	"		DAMP	"	60	95	spoon muddy on outside
										No samples between 72' and 91'
										well drilled to 100'; 4' of slumping
										occured prior to well installation

Projected Depth: 91'
W.L.: 61'
Continuous sampling: 20'-40'
Shelby tube: 48'

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER: 15	DATE: 8/12/92
TYPE OF DRILLING RIG: Air Rotary	GEOLOGIST: John Brooks	ELEVATION: ~385

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % of clasts	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
5-7	Stg/ug	M	poorly bedded	—	—	Neg	10R 6/6 90	GS/ST	90	10R4/6/90	neg	0/100	
~~10-12~~	"	~~M→C~~	"	—	—		10YR 8/2 10			10YR 6/6/10	"	"	
								QTZ	10	N3	"	0	
10-12	"	M→C	"	—	—	"	10R 4/6	GS/ST	95	10R4/6/80	neG	95	
~~12-17~~	"	~~M~~	"	—						10YR 6/6/10	"	"	
										10R 7/4/10	"	"	
								Qtz	5	N3	"	0	
15-17	"	M	"	—	—	"	10R4/6	GS/ST	92	10R4/6/80	neg	95	
										10R6/6/10	"	"	
										10R6/6/10	"	"	
		(→Gritty clasts with		open structure; CaCO3		dissolution?	) →	SS	3	10YR6/4/10	"	"	Calc-sandstone?
								QT	5	N3-N7	"	0	
20-22.5	"	M	poorly bedded	—	—			GS	80	10R4/6/80	neG	95	
										10R6/6/10	"	"	
										10R6/6/10	"	"	
								GS(?)	5	5Y8/1	"	"	
								BS(?)	2	N2	"	"	
								~~Qtz~~	~~3~~	~~N3~~	~~"~~	~~0~~	
22.5-25	"	M→C	"	—	—	neg	~~10R5YR 4/4/80~~ 10YR 8/6/20	GS/ST	90	~~10R4/6 5R4/6/80~~ 10YR4/6/80	neg	97	
								GS(?)		5Y4/1	"	"	
								Qtz	5	N6	"	0	
									1	N1	"	100	organic material?

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER: L6	DATE: 8/12/92
TYPE OF DRILLING RIG: Air Rotary	GEOLOGIST: John Brooks	ELEVATION: ~385

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % of clasts	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
25-27.5	SAP/GAP	M	—	—	—	neg	10R4/6 / 80	GS/ST	90	10R4/6/80	~~GS/ST~~	95	
							10YR 8/2 / 20			10YR 6/6/10	"	"	
										10YR 8/2/10	"	"	
								Qtz	8	n6	"	0	
									2	n2	"	100	organic ?
27.5-30	"	C → M	poorly bedded	—	—	neg	10R4/6 ~~80~~	GS/ST	90	10R4/6-10R4/6/90	neg	95	slightly friable
							10R3/4 /50			10YR6/6/10	"	"	"
							~~10~~	GS (?)	3	5Y 6/1 /100	"	"	"
							10YR 6/2/10	Qtz	6	n7			
									1	n2		100	organic ?
30-32.5	"	—	—	—	—	neg	10R 4/6/ 100	Qtz	100	n3	neg	0	
32.5-35	"	M ≫ C	"	—	—	neg	10R4/6/100	Qtz	5	n3	"	0	
								GS/ST	95	10R4/6 /90	"	95	
										10YR 6/8/10	"	"	
35-37.5	"	C → M	"	—	—	neg	10R4/6/100	GS (?)	3	n4	"	5	
								GS (?)	2	5Y 6/1	"	98	
								GS/ST	95	10R4/6 /90	neg		
										5Y 8/1 /5	"		
										10YR 6/6/5	"		
50-52	"	C → M	"	—	—	neg	10R4/6 /70	GS/ST		10R 4/6/80	neg	96	
							10YR 8/2 / 30			10R 6/6/10	"	"	
										10YR 8/2/10	"	"	
								Qtz	2	n6	"	0	
									1	n2	"	100	organic (?)

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER: [redacted]	DATE: 8/12/92
TYPE OF DRILLING RIG: Air Rotary	GEOLOGIST: John Brooks	ELEVATION: ~385

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % of clasts	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
55-57	SAP/Cng	m	poorly bedded	—	—	neg	5YR 3/4/50	GS/ST	95	10R4/6/80	neg	98	
							10R4/6/50			10R6/6/10	"	"	
										10YR8/2/10	"	"	
								Bogtz	3	n3	"	3	
								GS (?)	2	5Y6/1	"	[illegible]	
60-62	"	m	"	—	—	neg	5YR 3/4	qtz	4	n5	"	0	
								GS/ST	95	10R4/6/80	"	98	
										10YR4/2/10	"	"	
										10YR6/6/10	"	"	
								[illegible]	1	n2	"	100	organic ?
65-67	"	"	"	—	—	neg	5YR 3/4	GS/ST	95	10R4/6/90	neg	95	friable
										10YR6/6/5	"	"	"
										10YR4/2/5	"	"	"
								Qtz	5	n4	"	0	
70-72	"	m→c	"	—	—	neg	5YR3/4/90	GS/ST	60	10R4/6/90	"	95	
							n3 /5			10YR6/6/10	"	"	
							10YR8/2/5	Qtz	40	n7-n4	"	0	

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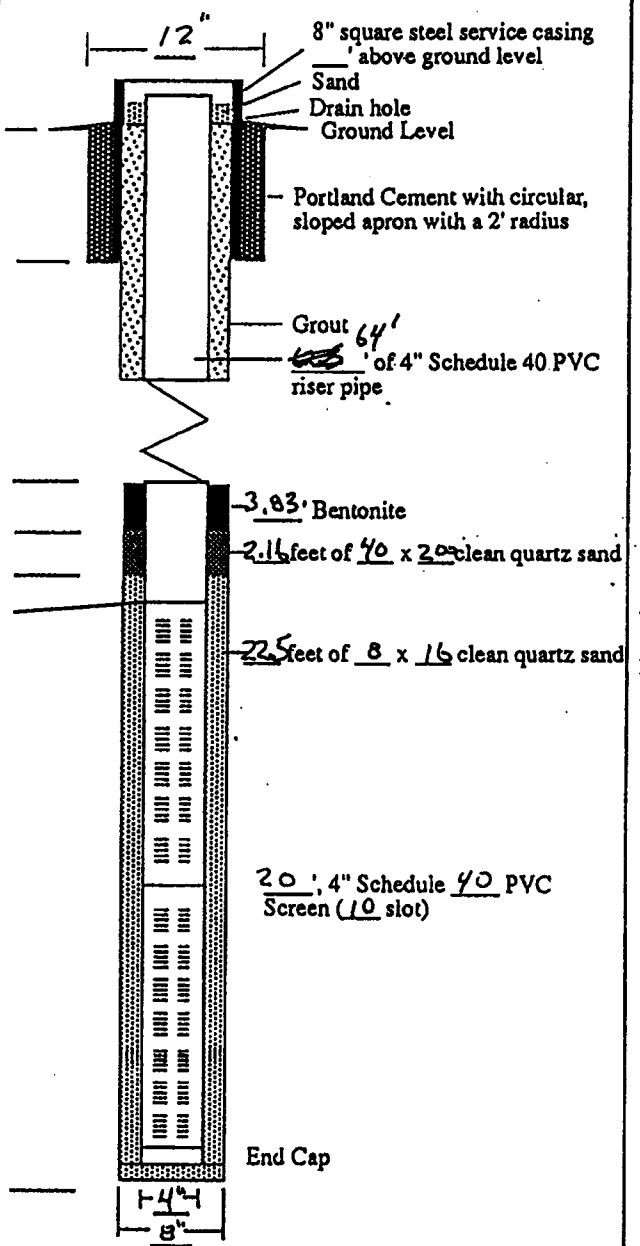
Emery & Garrett Groundwater Inc.

Project: Loudoun Landfill
Driller: Groundwater Systems
Geologist: John Brooks
DNR Observer: Richard Ryan
Well: ~~MW 25~~ L6

Date Drilled: 8/11/92
Depth to Bedrock: none
Total Depth of Well (g.l.): 81.5'
Static Water Level: 73.85 (8/19/92)
Ground Elevation: ~405'

Monitoring Well MW 25 "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)	Construction Details	Well Construction



Material Used

Volume of Grout 16
(# of 94 lb bags)

Volume of Bentonite 1.5
(# of 50 lb container)

Volume of 40 x 200 sand 3/4
(# of 100 lb bags)

Volume of 8 x 16 sand 122
(# of 50 lb bags)

Splitspoon Samples

21 bagged samples
received by [signature]

Development

Pump rate _____

Time pumped _____

Comments:

Development OK by

_____

_____
(printed name)

Date _____

Construction Ok by [signature]
(printed name) _____
Date 8/21/92

EGGI BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems | WELL NUMBER: L6 | DATE: August '11 –

TYPE OF DRILLING RIG: Air rotary | GEOLOGIST: John Brooks | ELEVATION: ~405'

Depth to base of splitspoon (feet)	Thickness (in.)	% Recovery	Rock Type (See codes)	Color #	USCS Code	Moisture content	Grain Size Matrix: %cly,slt,snd	Conglom. Struct % Clasts	% Wthrd	Description
6.5'	16	~90	SAP/cng	10R 4/6		moist-dry	65, 30, 5	25	90	Saprolite after pebble conglomerate
11.5	13	70	SAP/cng	10r 4/6		"	25, 70, 5	80	80	qtzite clasts to ~4cm
16.5	11	60	"	"		"	5, 90, 5	50	90	
21.5	~10	50	"	10r 4/6- 5Yr 4/4		"	5, 85, 10	30	95	
25'										2 tries, no recovery - qtzite boulder
31.5'	~7"	40	"	10R 4/6- 5Yr 4/4		"	15, 70, 5	50	90-95	sandstone/siltstone clasts friable up to ~6cm
36.5'	11	60	"	10R 4/6		"	"	40	85	
41.5'	9	50	"	10R 4/6 -5Yr 4/4		"	"	45	90	
46.5'	5-6	30	"	10R 4/6		"	"	45	90	
48.5'	16	90	"	10R 4/6		"	"	40	90	
50' 52.5'	16	90	"	"		"	"	60	85	~8-12 cm pocket of med-grained sand.
52.5' 55'	14.4	80	"	"		"	"	55	85	
55' 57.5'	18	100	"	"		"	"	50	85	
57.5'	10	55	"	"		"	"	35	90	~4.5 cm pocket of fine-sand (weathered carbonate sandstone clasts?)
60'	18	100	"	5Yr 4/4- 10R 4/6		"	"	50	90	
62.5	~12	65	"	5Yr 4/4		"	"	60	90	
65'	6	35	"	"						"Shelby" tube 6" recovery
70	12	70	"	"						2nd try for Shelby tube
75	9	50	"	5YR 4/4-3/4		wet	"	60	80	Soil damp ~70'-72', wet at 75'
80	14	80	"	5YR 3/4		"	"	40	80	loose mud on top of sample
85	9	50	"	5YR 3/4		"	"	40	80	

EGGI BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems | WELL NUMBER: L6 | DATE: 8/11/92

TYPE OF DRILLING RIG: Air Rotary | GEOLOGIST: John Brooks | ELEVATION: ~405'

Depth to base of splitspoon (feet)	Thickness (in.)	% Recovery	Rock Type (See codes)	Color #	USCS Code	Moisture content	Grain Size Matrix: %cly,slt,snd	Conglom. Struct % Clasts	% Wthrd	Description
90'	18	100	SAP/wng	5YR3/4		wet	~20,70,10	50	90	
95'	~4"	20	"	"		"	"	30	90	sample loose/wet
										Collapse resulted in installation of well to 81.5'. water level at 8:30 8/12/92 = 72.2'

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER: L6	DATE: 8/11
TYPE OF DRILLING RIG: Air Rotary	GEOLOGIST: John Brooks	ELEVATION: ~405'

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % of rock	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alteration	OTHER
5-6.5	SAP/carb	m	poorly bedded	—	—	neg	10R 4/6/90	GS	15	10YR 8/2/90	N	100	
							10YR 8/6/10	"		10YR 8/6/10	N	100	
								QT	5	n4 /100	N	0	
								Gs/St	10	10R 4/6/100	N	100	
								Sc	<1	N2 /100	N	60	
10-11.5	Sap/carb	M→C	"	—	—	neg	10R 4/6/80	QT	20	N8-N4	N	0	
						weathered Hdsclay	10YR 8/6/10	Gs/St	50	10R 4-6	N	100	
								GS	10	10YR 8/2	N		
15-16.5	"	m	"	—	—	neg	10R 4/6/90	Qtz	10	n4/100	N	0	
								Gs/St	35	10R 4/6/90	N	90	
								"	5	10YR 8/6/10	N	"	"
20-21.5	"	m	"	5YR 4/4	2.5	N	5YR 4/4	Gs/St	5	10YR 8/6/10	N	95	2-3cm Clasts
				10r 4/6	7.5	N	10R 4/6	Qt	10	N8 /100	N	0	
								Gs/St	20	10R 4/6/90	N	~80	friable
								"		5YR 5/6/10	N	"	"
30-31.5	"	m→c	"	—	—	N	10R 4/6	Gs/St	20	10R 4/6 /90	N	~80	"
								"	10	10YR 6/6/10	N	"	"
								Qtz	20	N6-N8	N	0	
35-36.5	"	m→c	"	—	—	N	10r 4/6 to 5YR 4/4	Gs/St	25	10R 4/6/90	N	80	friable
										10YR 5/6/10	N	"	"
								Qtz	5	n6-n8	N	0	
								Sc	5	5Y 4/1	N	90	
41.5	"	m→c	"	—	—	N	10R 4/6 to 5YR 4/4	Qtz	15	N3-N5	N	0	
								Gs/St	30	10R 4/6/90	N	~80	friable
										10YR 6/6/10	N		"

Projected Depth 107'
2½' SAND' 45-65
Projected u 77'

Shelby Tube - 65'

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER: L6	DATE: 8/11/92
TYPE OF DRILLING RIG: Air Rotary	GEOLOGIST: John Brooks	ELEVATION: ~405'

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % of rock	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
45-46.5	Shale/Clay	—	—	—	—	neg	10R 4/6-5YR 4/4	QT	15	5Y 6/1/10	neg	0	
										n3-n6/90	"	"	
								GS/ST	30	10R 4/6/80	N	90	
										5YR 6/1/10	"	"	
										10YR 6/6/10	"	"	
~~50-47~~	"	m	Poo-bedded	—	—	N	10R 4/6-5YR 4/4	QT	5	n3-n6	N	0	
48.5	"	m	"					QT-SC	5	n5	n	95	
								GS/ST	30	10R 4/6/80	"		
18.5 ~~50-48.5~~	"	c → m	"			N	10R 4/6-5YR 4/4			5YR 6/1/20	"		
50' ↓	↓	↓	↓			↓	↓	QT	10	n3-n6	"	0	
				Sand (pocket between clasts)	~2	N		GS/ST	50	5Y 6/1/10	N	90	friable
										10R 4/6/80	"	"	"
~~53.5-55~~	"	m → c	"	—	—	—	~~5YR 4/4~~ 10R 4/6			10YR 6/6/10	"	"	"
0' ~~53.5~~	"	m → c	"	—	—	N	5YR 4/4 - 10R 4/6	GS/ST	45	10R 4/6/80	N	85	"
- 52.5'										5Y 6/1/5	"	"	"
										5GY 6/1/15	"	"	"
								QT	10	n4-n3	"	0	
2.5' ~~55-53~~	"	m → c	"	—	—	N	5YR 4/4-10R 4/6	GS/ST	35	10R 4/6/70	N	90	"
- 55'										5Y 6/1/10	"	"	"
										5GY 6/1/10	"	"	"
								QT	15	n2 to n8	N	0	
55-57.5	"	m	"	Sand (Bicket?)	~1-2	N	5YR 4/4	GS/ST	25	10R 4/6/90	N	90	friable
										5Y 6/1/10	"	"	"
								QT	10	n4-n3	"	0	

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER: L6	DATE: 8/11/92
TYPE OF DRILLING RIG: Air Rotary	GEOLOGIST: John Brooks	ELEVATION: ~405

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % Rock	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
57.5-60'	Sp/cng	Clast→Mat	poorly bedded	—	—	N	5YR 3/4	GS/St	40	10R4/6/70	N	90	friable
										10YR5/4/20	"	"	"
										10YR6/6/10	"	"	"
								Qt Sc	5	5GY 6/1/100	"	70	"
								Qtz	5	n-4	"	0	
60-62.5	"	"	"	—	—	N	5YR 4/4	Qtz	10	n-2-n4	N	0	
								GS/St	50	10R4/6/70	"	90	friable
										10YR 7/4/15	"	"	"
										10YR 6/6/15	"	"	"
72.5-75	"	C→M	"	sAp/cng	4 (at bottom)	N	5YR 3/4	~~[illegible]~~ Qtz Sc	30	10Y 6/2/90	N	80	
										10YR 7/4/10	"		
								GS/ST	20	10YR 6/2/80	"	80	
										10R 4/6/20	"		
								Qtz	10	n3-n4	"	0	
77.5-80	"	M	"	—	—	N	5YR 3/4	Qtz	7	n8-n7	N	0	
								St/GS	33	5Y 6/1/30	N		
										10R4/6/40	"		
										5Y 6/4/30			
83.5-85	"	M→C	"	—	—	N	5YR 3/4	Sc (Lithic)	5	5Y 2/1/100	N	70	
								Qtz	10	n8-n9	N	0	
								GS/ST	20	5Y 6/4/20		90	
										10R4/6/90		"	
								GS(?)	5	10YR 6/6/100		100	

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER: L6	DATE: 8/11/92
TYPE OF DRILLING RIG: Air rotary	GEOLOGIST: John Brooks	ELEVATION: ~405

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % of rock	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
87.5-90'	Shale/ang	M->C	poorly bedded	—	—	N	5YR3/4	BS/ST	30	10YR6/6/10	N	90	
										10R4/6/60	"	"	
								Qtz	20	N-3	"	0	
								Qt-Sc	10	5GY6/1	"	90	
92.5'-95'	"	M	"	—	—	N	"	QtzSc	15	"	"	90	very jointed rock
								BS/ST	10	10YR7/4	"	"	
								Qtz	≤5	N2-N4	"	0	

170 Waukewan Street
Meredith, N.H. 03253
Phone (603) 279-4425
FAX # 603-279-8717

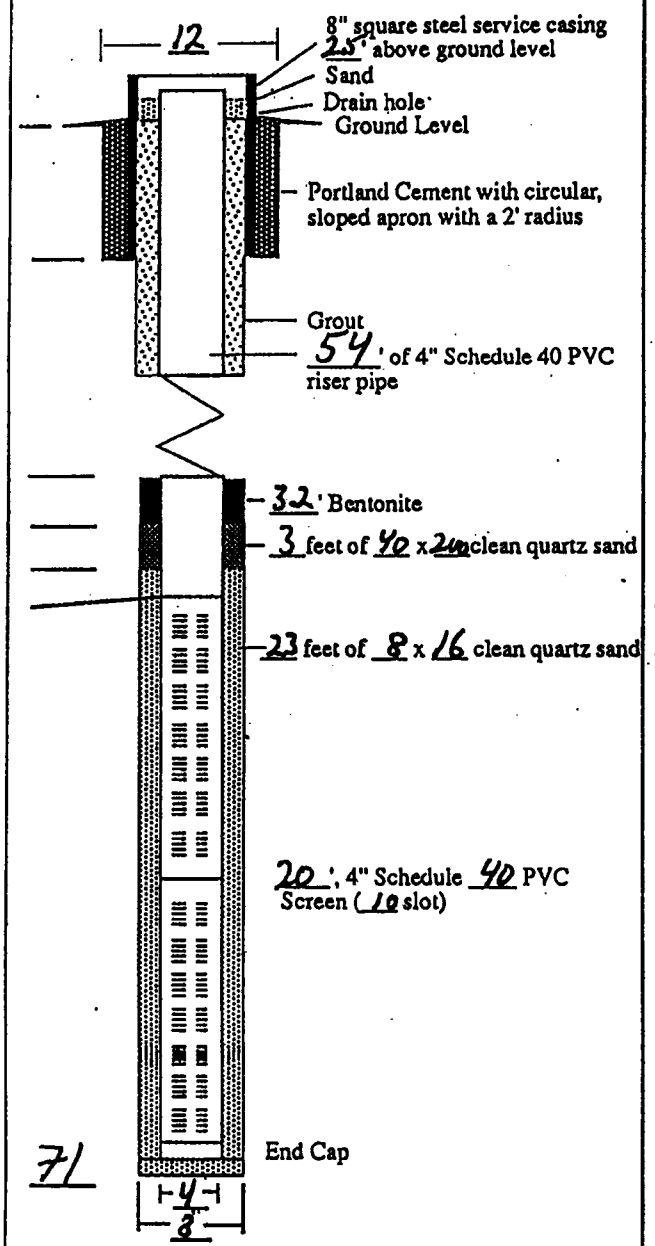
Emery & Garrett Groundwater Inc.

Project: Loudoun Landfill
Driller: Groundwater Systems
Geologist: JOHN BROOKS
DNR Observer: RICH RYAN
Well: MW ~~25~~ L-7

Date Drilled: 8/14/92
Depth to Bedrock: 72'
Total Depth of Well (g.l.): 71'
Static Water Level: 62.80 (8/19/92)
Ground Elevation: 390'

Monitoring Well MW 25 "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)	Construction Details	Well Construction



Material Used

Volume of Grout 35
(# of 94 lb bags)

Volume of Bentonite 1.8
(# of 50 lb container)

Volume of 8 x 16 sand 70
(# of 50 lb bags)

Volume of 40 x 100 sand 1
(# of 100 lb bags)

Splitspoon Samples

0 bagged samples

received by

Development

Pump rate

Time pumped

Comments:

Construction Ok by Richard Ryan
(printed name)
Date 8/21/92

Development OK by

(printed name)

Date

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FAX # 603-279-8717

Emery & Garrett Groundwater Inc.

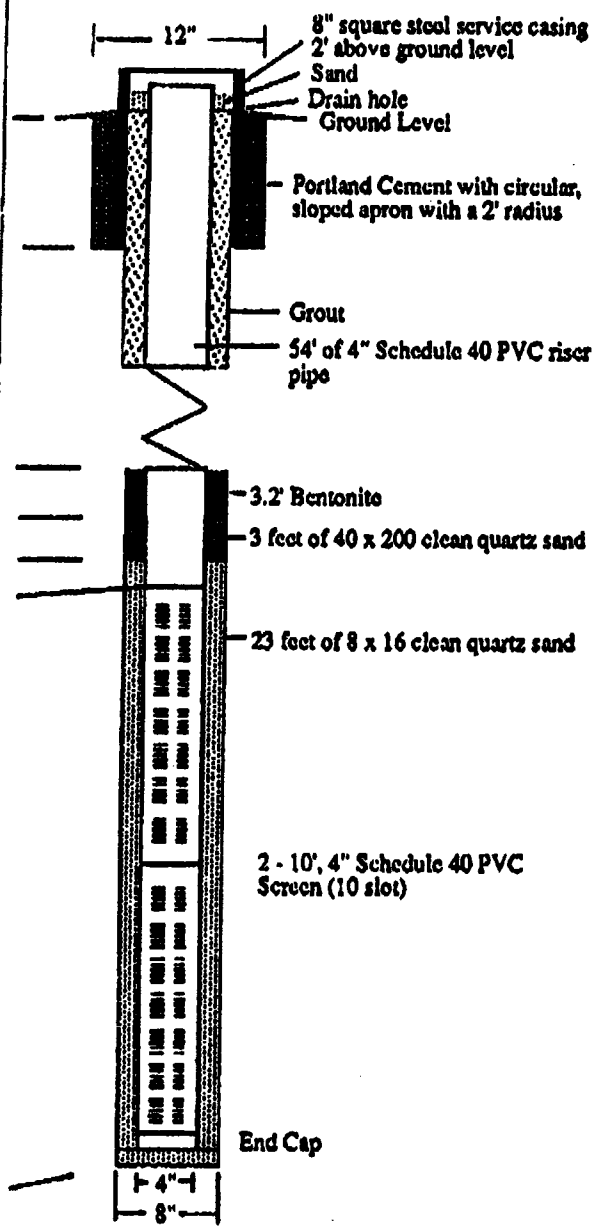
Project: *Loudoun County Landfill*
Driller: *Groundwater Systems*
Geologist: *John Brooks, PhD*
DER Observer: *Richard Ryan*
Well: *L7*

Date Drilled: *August 14,1992*
Depth to Bedrock: 72'
Total Depth of Well (g.l.): *71'*
Static Water Level: 60.8' *(8/14/92)*
Ground Elevation: ≈ *390'*

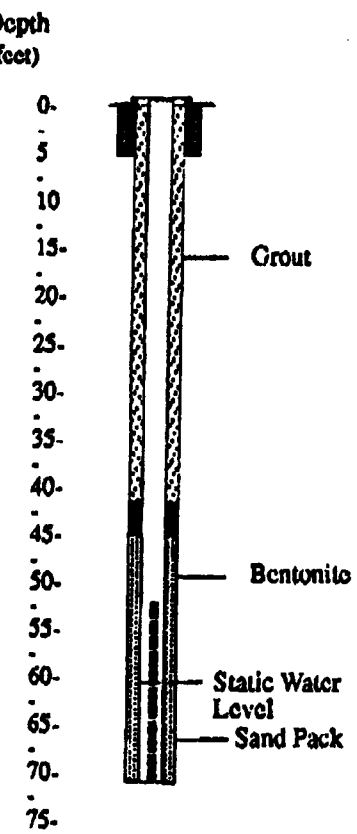
Monitoring Well L7 "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)
0	0
400	5
348.2	41.8
345	45
342	48
399	51
379	71

Construction Details



Well Construction



EMERY AND GARRETT GROUNDWATER, INC.

170 WAUKEWAN STREET
MEREDITH, NH 03253
(603) 279-4425

Project: Loudoun County Landfill
Driller: Groundwater Systems, Inc.
Geologist: John Brooks, PhD
Date Drilled: 8/14/92
Well #: L7

Static Water Level: 60.8' (8/14/92)
Depth to bedrock: 72'
Well Diameter: 4"
Total Depth: 71'
Yield: unknown

DEPTH	WELL LOG	SAMPLE #	SAMPLE INT.	* REC. %/IN	ROCK TYPE (CODE)	DESCRIPTION
0						Samples not required for this well because of sampling at L7D.
2.5						Cuttings were collected but not described in detail. Samples were collected at
5						10 foot intervals between 10 and 70 feet.
7.5						
10					Sap/Cng	
12.5						
15						
17.5						
20					Sap/Cng	
22.5						
25						
27.5						
30					Sap/Cng	
32.5						
35						
37.5						
40					Sap/Cng	
42.5						
45						
47.5						
50					Sap/Cng	
52.5						
55						
57.5						
60					Sap/Cng	Change to dark brown cutting; due to dampness/weathering
62.5						
65						No cuttings from 65 to 70 feet due to wetness of saprolite.
67.5						
70					Sap/Cng	Collapse occurred to 71 feet. Multiple attempts to clean out hole below bedrock/
72.5						saprolite interface failed so well installed to 71 feet.

Cuttings of bedrock collected at 10 foot intervals between 70 and 120 feet. Well drilled to 141 feet.

Medium red-brown saprolite after conglomerate
As above but beneath the water table
Bedrock; Goose Creek Fm. conglomerate
ND - not determined
* 18" split-spoon

EMERY AND GARRETT GROUNDWATER, INC.

170 WAUKEWAN STREET
MEREDITH, NH 03253
(603) 279-4425

Project: Loudoun County Landfill
Driller: Groundwater Systems, Inc.
Geologist: John Brooks, PhD
Date Drilled: 8/14/92
Well #: L7

Static Water Level: 60.8' (8/14/92)
Depth to bedrock: 72'
Well Diameter: 4"
Total Depth: 71'
Yield: unknown

DEPTH	WELL LOG	SAMPLE #	SAMPLE INT.	* REC. %/IN	ROCK TYPE (CODE)	DESCRIPTION
75						
77.5						78'; muddy drilling bit and rods wet from 78 to 60 feet.
80					Cng	A yield of < 5gpm occurred after hole "developed" a little. Yield interpreted to be
82.5						from above and/or at the bedrock/saprolite interface.
85						
87.5						
90					Cng	
92.5						
95						
97.5						
100					Cng	Bottom of hole. No additional water observed within bedrock.

Cuttings of bedrock collected at 10 foot intervals between 70 and 120 feet. Well drilled to 141 feet.

Medium red-brown saprolite after conglomerate
As above but beneath the water table
Bedrock; Goose Creek Fm. conglomerate
ND - not determined

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Meredith, N.H. 03253
Phone (603) 279-4425
FAX # 603-279-8717

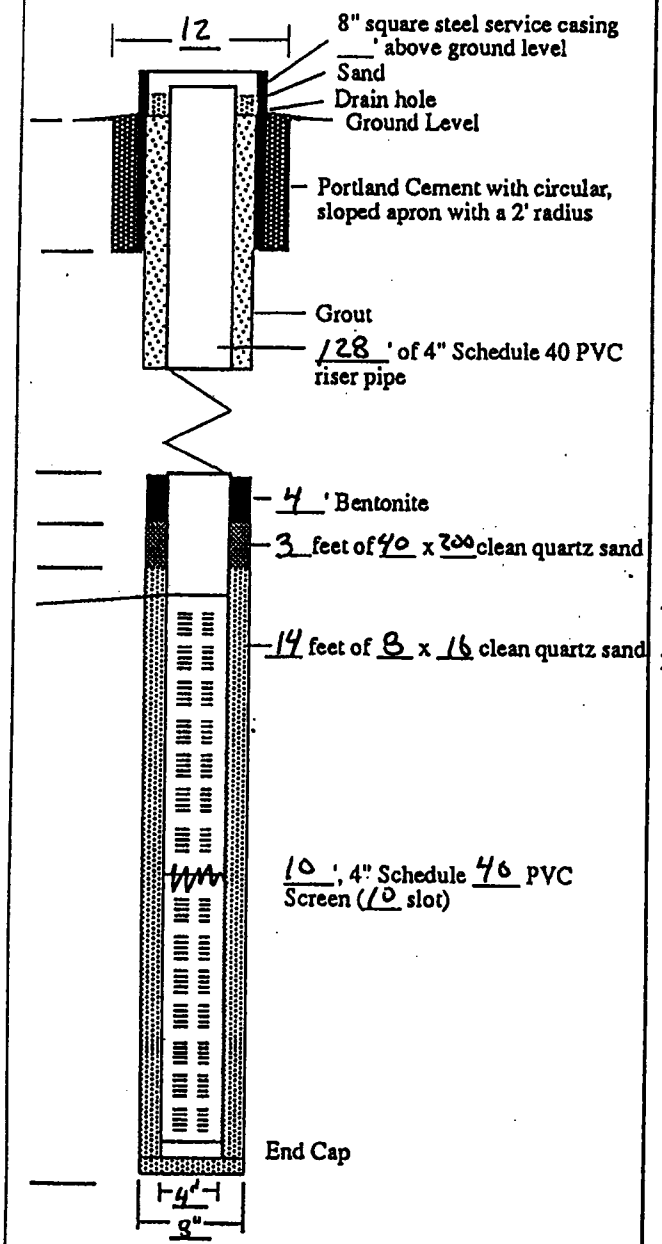
Emery & Garrett Groundwater Inc.

Project: Loudoun Landfill
Driller: Groundwater Systems
Geologist: John Brooks
DNR Observer: Richard Ryan
Well: ~~MW-21~~ L7D

Date Drilled: 8/13/92
Depth to Bedrock: 63'
Total Depth of Well (g.l.): 135
Static Water Level: 62.83 (8/19/92)
Ground Elevation: 390

Monitoring Well MW 25 "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)	Construction Details	Well Construction



Material Used

Volume of Grout 72
(# of 94 lb bags)

Volume of Bentonite 1
(# of 50 lb container)

Volume of 40 x 200 sand 1
(# of 50 lb bags)

Volume of 8 x 16 sand 4
(# of 100 lb bags)

Splitspoon Samples

18 bagged samples
received by Richard Ryan
FOR M. FAIRBANKS

Development

Pump rate_____

Time pumped_____

Comments:

Development OK by

_____

_____
(printed name)

Date_____

Construction Ok by Richard Ryan
(printed name)
Date 8/21/92

EGGI BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

page 1 of 1

DRILLER: Groundwater System | WELL NUMBER: [redacted] | DATE: 8/13/92

TYPE OF DRILLING RIG: Air Rotary | GEOLOGIST: John Brooks | ELEVATION: ~390

Depth to base of splitspoon (feet)	Thickness (in.)	% Recovery 18' spoon	Rock Type (See codes)	Color #	USCS Code	Moisture content	Grain Size Matrix: %cly,slt,snd	Conglom. Struct % Clasts	% Wthrd	Description
7	18	100	SAP/cng	10R4/6		damp-dry	15, 80, 5	40	100	
12	18	100	"	10R4/6		"	"	50	95	
17	18	100	"	10R4/6		"	"	50	95	
22	17	95	"	10R4/6		"	"	60	90	
25	18	100	"	"		"	"	50	95	
27.5	16	90	"	5YR4/4		"	"	40	95	
30	13	75	"	"		"	"	50	70	Qtz clasts comprise ~30% of spoon sample
32.5	16	90	"	"		"	"	50	95	
35	0	0	—	—	—	—	—	—	—	
37.5	~14	80	"	"		"	"	45	90	
40	9	50	"	"		"	"	55	80	large clasts of qtz
-45	0	0	—	—	—	—	—	—	—	shelby tube crushed - no sample
-47.5	11	60	"	"		"	—	—	—	6" Brass liners for split spoon sample
-50	0	0	—	—	—	—	—	—	—	2nd try with Brass liners
52	4	25	"	"		"	"	50	70	gs+ss clasts more competent
57	5	30	"	"		"	"	50	60	gs clast very competent
62	~2.5	20	"	"		wet	"	30	80	sample very near to bedrock. Split spoon muddy.
										- Cuttings of bedrock were collected at 10' intervals from 70' to 120'

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER: [redacted] D	DATE: 8/13/92
TYPE OF DRILLING RIG: Air Rotary	GEOLOGIST: John Brooks	ELEVATION: 390

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % of clasts	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
5-7	SP/Cy	M → C	Poorly bedded	—	—	neg	10R 6/6	ST/GS	90	10YR 8/6/30	neg	100	
										10YR 5/4/30	"	"	
										10YR 6/2/10	"	"	
										10R 4/6/20	"	"	
								Qtz	5	N7-N3	"	0	
										N2	"	100	organic(?)
10-12	"	C → M	"	—	—	neg	10R 4/6/90	GS/ST	85	10R 6/6/30	neg	100	
							10YR 8/2/10			10R 4/6/60	"	"	
										10YR 8/6/10	"	"	
								SS	10	10YR 6/6/100	"	95	calcareous weathered?
								Bio-Sc	5	N2	"	90	
15-17	"	C → M	"	—	—	neg	10R 4/6/90	GS/ST	80	10R 4/6/90	neg	100	
							10YR 8/2/10			10R 6/6/10	"	"	
								SS	10	10YR 6/6	"	90	weathered calc?
								Qtz	5	N4	"	0	
									5	N2	"	100	organic?
20-22	"	C → M	"	—	—	neg	10R 4/6/30	Qtz	10	N7-N4	neg	0	
							10YR 8/2/20	GS/ST	85	10R 4/6/70	"	100	
										10YR 6/6/30	"	"	
									5	N2	"	100	organic?
225-25	"	M → C	"	—	—	neg	10R 4/6/95	Qtz	5	N7	"	0	
							10YR 8/2/5	GS/ST	93	10R 4/6/90	neg	95	slightly friable
										10YR 6/6/5	"	"	?
										5GY 6/1/5	"	"	
									2	N2	"	100	organic?

Depth: 135
WL: 65
continuous sampling: 25-45
Shelby tube: 45

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: Groundwater Systems	WELL NUMBER [redacted]	DATE: 8/13/92
TYPE OF DRILLING RIG: Air rotary	GEOLOGIST: John Brooks	ELEVATION: -390

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS % of clasts	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
25-27.5	SAD/GRAV	m	poorly bedded	—	—	neg	5YR3/4 /90	Qtz	5	n7	neg	0	
							10YR 3/4/10	GS/ST	95	10R6/6/90	"	95	slightly friable
										10YR6/6/5	"	"	
										5YR3/4/5	"	"	
27.5-30	"	m	"	—	—	neg	5yr3/4/90	Qtz	30	n6-n3	"	0	
							10YR 3/4/10	GS/ST	70	10R6/6/70	"	95	slightly friable
										10R4/6/20	"	"	"
										10YR8/2/10	"	"	"
30-32.5	"	C→M	"	—	—	neg	5YR3/4/50	GS/ST	100	10R4/6/90			
							5R3/4/40			10YR 6/6/10			
							10YR8/2/10			10R3/4/10			
32.5-35	no recovery												
35-37.5	SAD/GRAV	m	"	—	—	neg	5yr3/4	Qtz	10	10YR6/2/50	neg	0	
										n4 /50	"	0	
								GS/ST	90	10R4/6/80		90	
										10YR6/6/10	"	"	
										10R3/4/5	"	"	
37.5-40	"	m→c	"	—	—	neg	5yr3/4	Qtz	20	n3-n7	neg	0	
								GS/ST	80	10R4/6/100			
50-52	"	m→c	"	—	—	neg	"	Qtz	50	n3-n6	neg	0	
								GS/ST	50	10R4/6/80	"	90	
										10YR6/6/20	"	"	
55-57	"	m→c	"	—	—	neg	5yr3/4	GS/ST	50	10YR /80	neg	~50	
										10R4/6/20	"	"	
								Qtz	50	n3-n7	"	0	
60-62	"	"	"	—	—	neg	"	Qtz	35	n3-n7	"	"	
								GS/ST	70	10YR 6/2	"	80	

170 Waukewan Street
Meredith, N.H. 03253
Phone (603) 279-4425
FAX # 603-279-8717

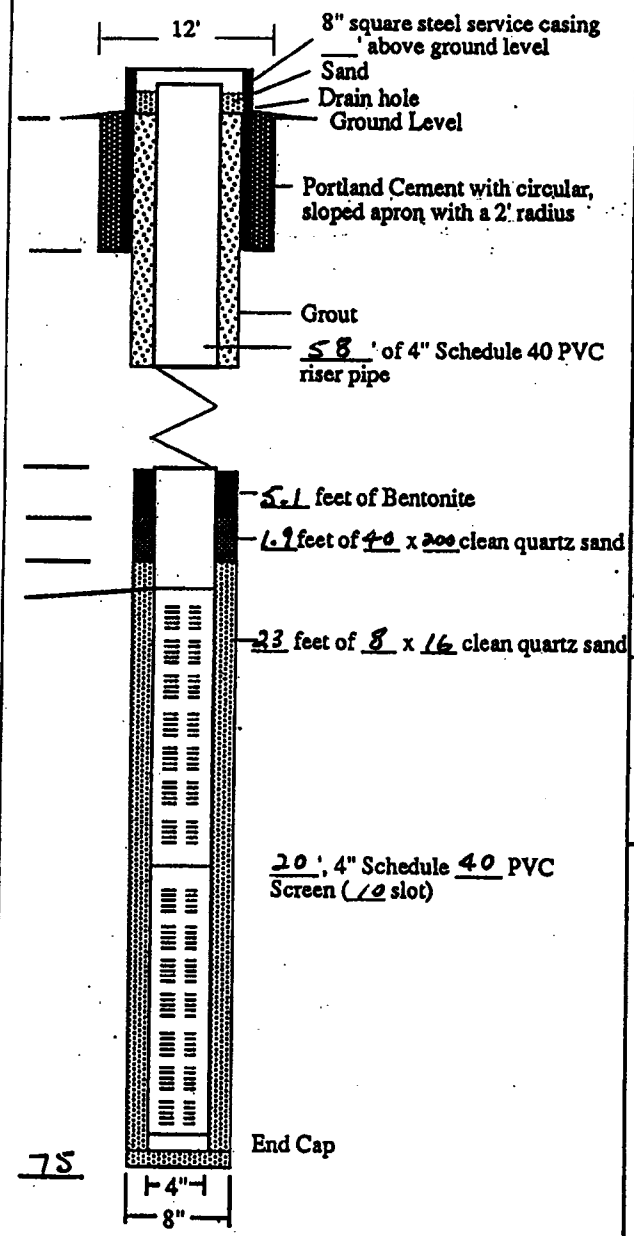
Emery & Garrett Groundwater Inc.

Project: Loudoun County Landfill
Driller: Groundwater Systems
Geologist: Jim Brady
DNR Observer: Rich Ryan
Well: L-11 D

Date Drilled: 9-1-92
Depth to Bedrock: 60'
Total Depth of Well (g.l.): 75 ft.
Static Water Level: 30.5' 9-2-92
Ground Elevation: 365

Monitoring Well L-11 D "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)	Construction Details



Well Construction

Material Used

Grout; 41 - 94 lb bags

Bentonite; 2.5 - 50 lb containers

40 x 200 Sand; 2 - 100 lb bags

8 x 16 Sand; 24.5 - 50 lb bags

58 feet of 4" Schedule 40 PVC riser

20 feet of 4" Schedule 40, 10 slot PVC screen

Splitspoon Samples

10 bagged samples

received by Rich Ryan

Development

Pump rate 10 gpm

Time pumped 3 hours

Comments: cleaned up very fast

Development OK by Richard Ryan

(printed name)

Date 9/24/92

Construction Ok by Richard Ryan

(printed name) RICHARD RYAN

Date 9/4/92

170 Waukewan Street
Meredith, N.H. 03253
Phone (603) 279-4425
FAX # 603-279-8717

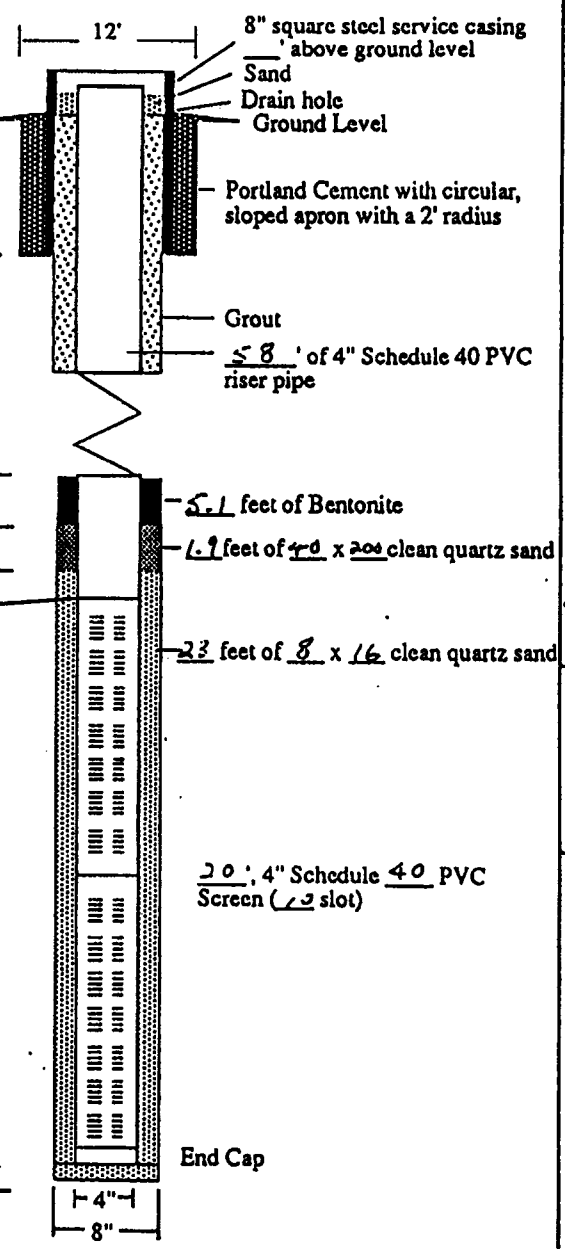
Emery & Garrett Groundwater Inc.

Project: Loudoun County Landfill
Driller: Groundwater Systems
Geologist: Jim Brady
DNR Observer: Rich Ryan
Well: L-11 D

Date Drilled: 9-1-92
Depth to Bedrock: 60'
Total Depth of Well (g.l.): 75 ft.
Static Water Level: 30.5' 9-2-92
Ground Elevation: 365

Monitoring Well L-11 D "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)	Construction Details
	0	
	5	
	45'	
	50.1'	
	53'	
	55'	
	75'	75



Well Construction

Material Used

Grout; 41 - 94 lb bags

Bentonite; 2.5 - 50 lb containers

40 x 200 Sand; 2 - 100 lb bags

8 x 16 Sand; 24.5 - 50 lb bags

58 feet of 4" Schedule 40 PVC riser

20 feet of 4" Schedule 40, 10 slot PVC screen

Splitspoon Samples

10 bagged samples

received by Rich Ryan

Development

Pump rate_____

Time pumped_____

Comments:

Development OK by

_____

(printed name)

Date _____

Construction Ok by Richard Ryan

(printed name) RICHARD RYAN

Date 9/4/92

170 Waukewan Street
Meredith, N.H. 03253
Phone (603) 279-4425
FAX # 603-279-8717

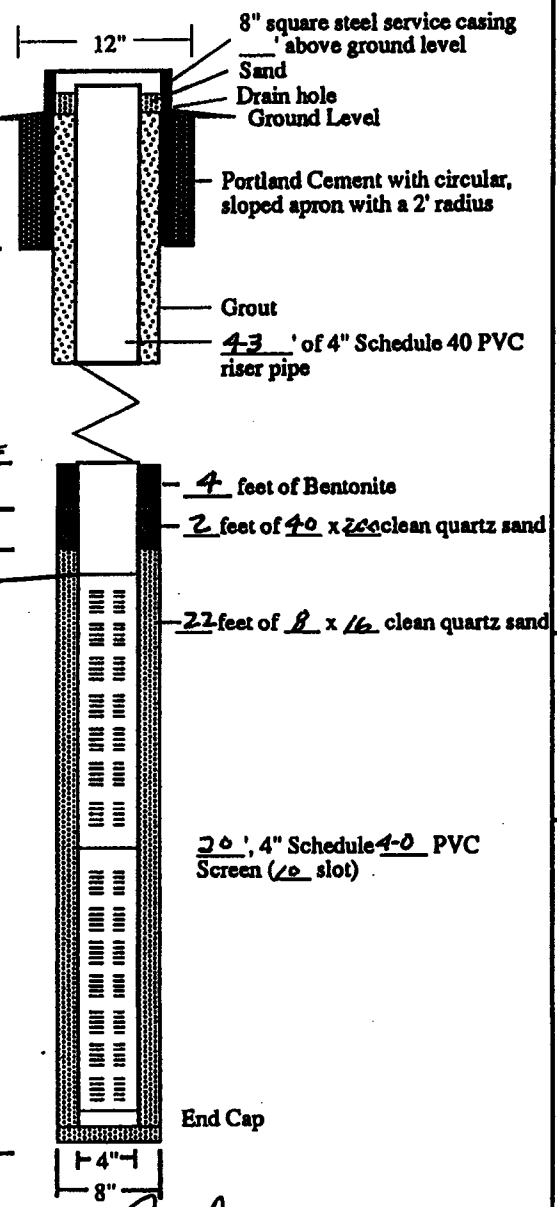
Emery & Garrett Groundwater Inc.

Project: Loudoun County Landfill
Driller: Groundwater Systems
Geologist: JIM BRADY
DNR Observer: RICH RYAN
Well: L-25

Date Drilled: 10-6-92
Depth to Bedrock: NA
Total Depth of Well (g.l.): 60'
Static Water Level:
Ground Elevation:

Monitoring Well L-25 "As Built" for Loudoun County Landfill

Elevation (MSL)	Depth (Feet)	Construction Details
	0	8" square steel service casing ___' above ground level; Sand; Drain hole; Ground Level
		Portland Cement with circular, sloped apron with a 2' radius
	5	Grout; 43' of 4" Schedule 40 PVC riser pipe
	32	~~32~~
	36	~~36~~
	38	~~38~~
	40	4 feet of Bentonite; 2 feet of 40 x 200 clean quartz sand; 22 feet of 8 x 16 clean quartz sand; 20', 4" Schedule 40 PVC Screen (10 slot); End Cap
	60	



Well Construction

Material Used

Grout; ___ - 94 lb bags

Bentonite; 1.5 - 50 lb containers

40 x 200 Sand; 1 - 100 lb bags

8 x 16 Sand; 33 - 50 lb bags

43 feet of 4" Schedule 40 PVC riser

20 feet of 4" Schedule 40, 10 slot PVC screen

Splitspoon Samples

_____ bagged samples

received by _____

Development

Pump rate 12 gpm

Time pumped 4.5 hours

Comments:

10, SURGES, VERY CLEAR WHEN PUMPED OVER 5 MINUTES, AFTER SURGING.

Development OK by Richard Ryan

(printed name) _____

Date 10/8/92

Construction Ok by Richard Ryan

(printed name) _____

Date 10/7/92

EMERY AND GARRETT GROUNDWATER, INC.
170 WAUKEWAN STREET
MEREDITH, NH 03253
(603) 279-4425

SAMPLE TRANSFER FORM

Project: Loudoun County Landfill
Driller: Groundwater Systems, Inc.
Geologist: Jim Brady
Date Drilled: 10-6-92
Well #: L-25

SAMPLE		SAMPLE		SAMPLE	
#	INT.	#	INT.	#	INT.
1	10'-12'				
2	20'-22'	Split Spoons			
3	30'-32'				
4	40'-42'				

SAMPLES RECEIVED BY: [signature]

DATE: 10/7/92

EGGI BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: GW System | WELL NUMBER: L-25 | DATE: 10-6-92

TYPE OF DRILLING RIG: Air Rotary | GEOLOGIST: Jim Beady | ELEVATION:

Depth to base of splitspoon (feet)	Thickness (in.)	% Recovery	Rock Type (See codes)	Color #	USCS Code	Moisture content	Grain Size Matrix: %cly,slt,snd	Conglom. Struct % Clasts	% Wthrd	Description
12'	4"		Sp/Cg	5YR 4/4		dry	20-60-20	40	90	dk gry clast - St GS
22'	12"		"	10R 4/6		dry	15-65-20	45	90	dk gry, St, GS - schist
32'	6"		Sp/Cg	10R 4/6		dry/moist	10-65-25	35	90	dk gry, GS, St
42'	12"		"	10R 4/6		wet	10-65-25	50	85	dk gry GS St, Sa

EGGI ADDITIONAL BORING INFORMATION FOR LOUDOUN LANDFILL WELLS

DRILLER: GW SYSTEMS	WELL NUMBER: L-25	DATE: 10-6-92
TYPE OF DRILLING RIG: air Rotary	GEOLOGIST: Jim BRADY	ELEVATION:

Depth range of sample	Rock type	Matrix vs Clast supported	STRUCTURES (Primary) (codes)	LAYERING Composition (ie sand,clay)	LAYERING Thickness (inches)	MATRIX HCL test (pos/neg)	MATRIX COLOR #/%	CLASTS Rock (code)	CLASTS %	CLASTS Color #/%	CLASTS HCL test (pos/neg)	CLASTS Alter-ation	OTHER
10-12	Sp/GG	m	NA			n	5YR 4/4	qtzt	85	10YR 6/2		5%	S. GS
20-22	Sp/Kg	m				n	10R 4/6	qtzt	70	N5		5%	
								St	25	10R 6/6		100	GS, Sch.
30-32	"	m				N	10R 4/6	qtzt	75	10R 7/2			
								GS	20	5R 7/6			St.
40-42'	"	"	"			N	10R 4/6	qtz		N5		5	
								GS		5Y 8/4		100	
								St		10R 6/6		95	
								Ss		10R 5/4		85	