ADDENDUM NUMBER 1:
CITY OF BERLIN
BID # 2023-12
EAST MILAN ROAD LANDFILL
GAS MIGRATION MITIGATION PLAN
REQUEST FOR PROPOSALS

Addendum #1 Issued: September 26, 2023
For Bids Due: September 28, 2023 at 2:00 PM EST

This addendum clarifies and modifies parts of the Project Specifications and address questions from contractors for the East Milan Road Landfill, **Gas Migration Mitigation Plan**. The Contractor shall notify their subcontractors and suppliers of any changes or modifications contained in this addendum. The Contractor shall acknowledge receipt of this addendum on the Bid Form.

The Project Specifications for the subject project shall be clarified as follows:

A. RESPONSE TO QUESTIONS

1. What type of landfill it it and are any drilling locations within the landfill?
   The landfill is a municipal solid waste landfill that accepted a variety of municipal solid wastes. All drilling locations are outside of the landfill.

2. Are there any health and safety hazards we should be aware of?
   The soil surrounding the closed landfill have elevated methane concentrations. See attached table with recent methane measurements at monitoring locations that are labeled on the design drawings. Contractor is responsible for monitoring soil gas conditions while drilling.

3. What are the soil conditions in the area of the proposed drilling locations?
   See attached boring logs.

4. If a contractor can't use a cased/drive and wash drilling to meet the required diameter, what happens if the proposed depth can't be reached?
   Conditions in the field will be determined for Contractors that are not using cased/drive and wash drilling methods. Drilling depths may be adjusted as conditions change.

5. The #467 aggregate designation is an older reference and might be difficult or impossible to get..

   NHDOT suggested a 3/8" or 1/2" wash stone aggregate would be better suited for a well application and is readily available.
   See attached gradation for the #467 aggregate that is specified to be used in the 10" gas ventilation wells. Contractor to supply material that meets this gradation or is equivalent. If adjustments are made it should not be more coarse on the larger stone sizes.

Attachments
EMRL Gas Monitoring Results

EMRL Soil Boring Logs
NHDOT #467 Gradation Chart

END OF ADDENDUM NO. 1

Table 1

City of Berlin, NH
East Milan Road Landfill
Soil Methane Gas Measurements

	Gas Meter	Barometric	GP-1	GP-2	GP-3	GP-4	GP-4S	GP-4D	GP-5	GP-6	GP-7	GP-8	GP-9	GP-9A	GP-9B	GP-10	GP-10A	FBOP WPS	FBOP WWS	FBOP TB
	Model	Pressure	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL
5/25/2017	Eagle 2	29.88	-	-	-	-	-	-	-	20	20	40	1,680	-	-	1,360	20	-	-	-
5/25/2017	GEM 2000	29.88	-	-	-	-	-	-	-	0	0	0	30	-	-	77	0	-	-	-
6/22/2017	Eagle 2	28.74	2	280	190	2,010	-	-	10	1	2	1	2	-	-	2,010	2	-	-	-
6/22/2017	GEM 2000	28.74	0	112	82	1,124	-	-	40	0	0	0	0	-	-	804	0	-	-	-
1/3/2018			0	28	22	100	-	-	2	0	0	0	0	-	-	100		-	-	-
4/18/2018			0	0	0	100	-	-	20	0	0	0	100	-	-	100	0	-	-	-
4/19/2018			NT	NT	NT	100	-	-	NT	NT	NT	NT	80	-	-	100	0	-	-	-
5/25/2018	GEM 2000	28.58	-	-	-	-	990	938	-	-	-	-	0	0	0	-	-	-	-	-
5/31/2018			0	>100	>100	>100	>100	>100	>100	0	0	0	0	-	0	>100	>100	-	-	-
12/26/2018			0	53	12	100	100	100	77	0	0	0	0	-	-	100	0	-	-	-
6/12/2019			0	100	17	100	100	100	57	0	0	0	0	-	-	100	0	-	-	-
9/23/2019			0	100	100	100	100	100	14	0	0	0	0	-	-	100	0	-	-	-
12/30/2019			0	100	100	100	35	41	45	0	0	0	0	-	-	100	0	-	-	-
2/10/2021			0	31	100	100	0	13	100	52	0	0	0	0	0	100	0	-	-	-
5/4/2021			0	0	0	100	100	100	69	0	0	0	0	0	0	0	0	-	-	-
5/12/2021			0	0	0	0	100	100	0	7	0	3	4	0	4	100	5	-	-	-
5/25/2021			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
6/18/2021			0	0	37	100	100	100	15	0	0	0	0	0	0	88	0	-	-	-
7/20/2021			0	100	100	100	100	100	63	0	0	0	0	0	0	75	0	-	-	-
7/29/2021			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
8/25/2021			0	8	20	100	100	0	0	0	0	0	0	0	0	13	0	0	0	0
9/27/2021			0	0	0	100	100	100	56	0	0	0	0	0	0	0	0	0	0	0
10/26/2021			0	100	100	100	100	100	63	0	0	0	0	0	0	100	0	0	0	0
11/23/2021			0	0	0	100	100	29	24	0	0	0	0	0	0	0	0	0	0	0
12/16/2021			0	48	88	100	100	100	20	0	0	0	0	0	0	100	0	0	0	0
1/24/2022			0	68	100	100	43	42	8	0	0	0	0	0	0	100	0	0	0	0
2/22/2022			0	0	60	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0
3/21/2022			100	100	100	100	0	100	21	0	0	0	0	0	0	*	*	0	0	0
4/18/2022			0	36	30	100	100	100	0	0	0	0	0	0	0	100	0	0	0	0
4/22/2022			0	0	0	0	0	0								100	0			
5/17/2022			0	0	0	0	100	100	0	0	0	0	0	0	0	100	0	0	0	0
6/27/2022			0	86	100	100	100	100	0	0	0	0	0	0	0	100	0	0	0	0
7/26/2022			0	54.3	54.3	100	100	82	0	0	0	0	0	0	0	100	0	0	0	0
8/24/2022			0	34	0	100	100	100	60.8	0	0	0	0	0	0	100	0	0	0	0
9/27/2022			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/18/2022			0	100	100	0	38	49	0	0	0	0	0	0	0	100	0	0	0	0
11/22/2022			0	0	100	100	100	100	23	0	0	0	0	0	0	41	0	0	0	0
12/20/2022			0	0	0	0	0	0	0	0	0	0	0	0	0	89	0	0	0	0
1/10/2023			0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
2/22/2023			0	0	0	100	67	100	62	0	0	0	0	0	0	100	0	0	0	0
3/22/2023			0	82	80	100	100	100	68	0	0	0	0	0	0	100	0	0	0	0
4/18/2023			0	100	100	100	100	100	0	0	0	0	0	0	0	100	0	0	0	0
5/25/2023			0	81	87	0	20	10	13	0	0	0	0	0	0	100	0	0	0	0
6/27/2023			0	100	100	100	100	100	91	0	0	0	0	0	0	100	0	0	0	0
7/26/2023			0	100	100	100	100	100	10	0	0	0	0	0	0	100	0	0	0	0
8/28/2023			0	86	100	100	100	100	0	0	0	0	0	0	0	100	0	0	0	0

Notes:
* = Results for GP-10 and GP-10A on March 21, 2022 were initially recorded as 100% LEL at GP-10A and 0% LEL at GP-10, but upon review were determined to have been recorded incorrectly with the locations reversed.
Methane LEL = 5% by volume
Gray shading indicates above 100% LEL
Methane UEL = 15% by volume
FBOP WPS = Federal Bureau of Prison Water Pump Station
FBOP WWS = Federal Bureau of Prison Wastewater Station
FBOP TB = Federal Bureau of Prison Training Building

Normandeau Engineers Inc.
The Concord Center
10 Ferry Street, Box 7
Concord, NH 03301-5022
(603) 224-5770
(603) 224-4128 (Fax)

TWM NORTHEAST

Ref. No.: 10814.11

June 13, 1990

Mr. Terry Block
City Engineer
City Hall
Berlin, New Hampshire 03570

Re: Phase II Hydrogeologic Investigation Report
East Milan Road Municipal Landfill

Dear Terry:

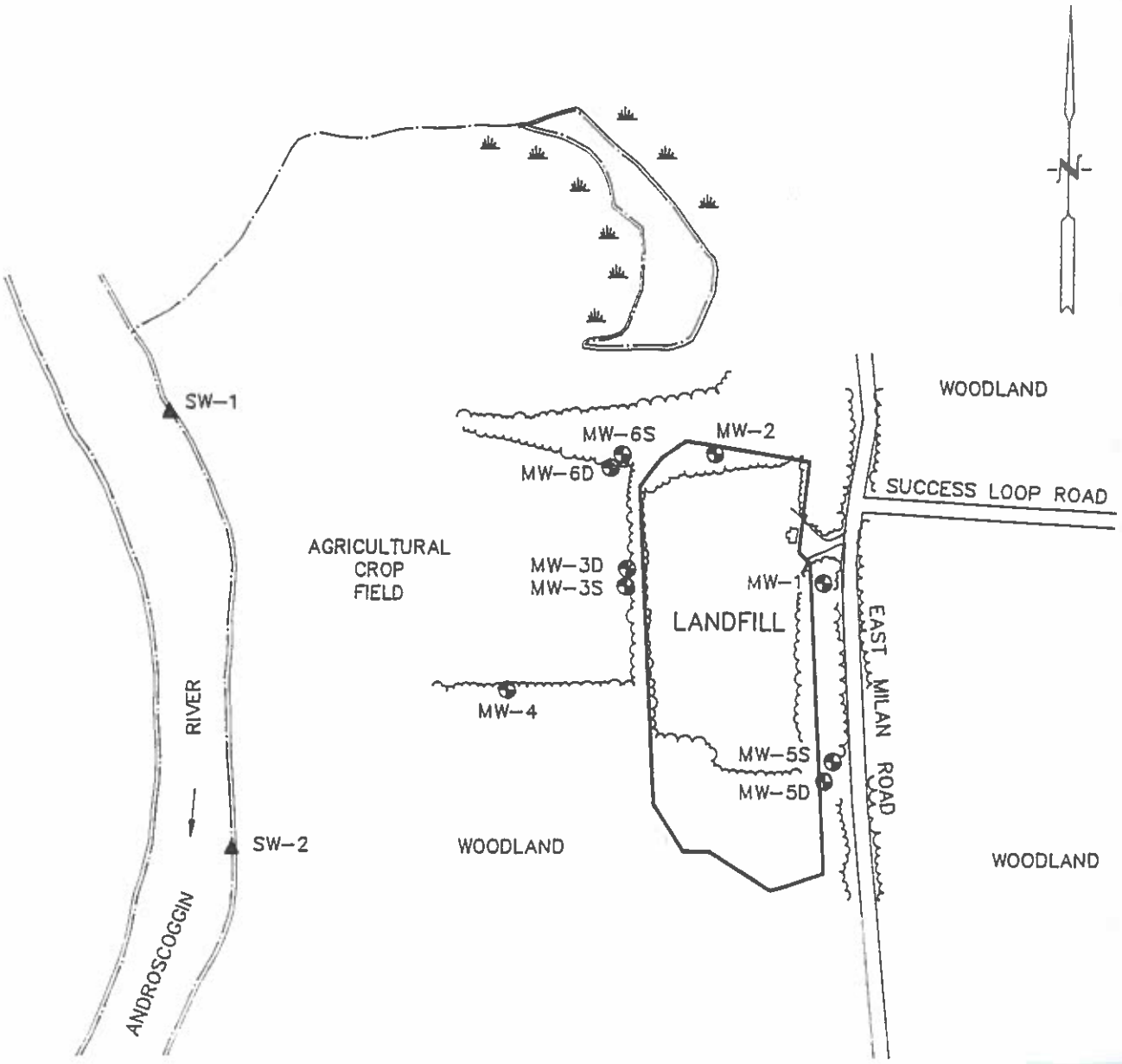
As per your request, please find enclosed twenty (20) copies of the Phase II Hydrogeologic Investigation Report for the East Milan Road Municipal Landfill. The report has been stamped DRAFT awaiting comments from the City and the Androscoggin Valley Solid Waste District (AVSWD). TWM/Normandeau Engineers (TWMNE) will incorporate your comments to the report prior to the submission to the State of New Hampshire. All comments received by the State will be addressed by TWMNE.

Should you have any questions regarding the report or other matters, please contact myself or Jim Barrett at (603) 224-5770. TWMNE appreciates the opportunity to provide our engineering services to the City of Berlin and the AVSWD.

Sincerely,
TWM NORTHEAST
NORMANDEAU ENGINEERS, INC.

Edward E. Crow
Project Engineer

EEC/slf
enclosure



APPROXIMATE SCALE: 1" = 500'

LEGEND

MW-1 ⊕ MONITORING WELL LOCATION

▲ SW-1 SURFACE WATER SAMPLING LOCATION

0814-3

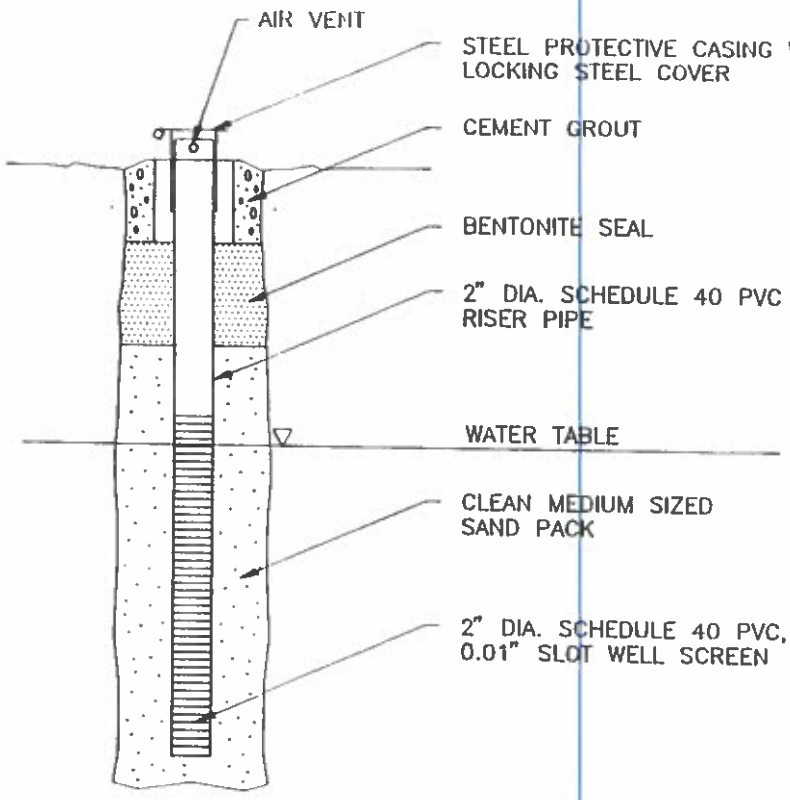
CITY OF BERLIN, NEW HAMPSHIRE
PHASE II HYDROGEOLOGIC INVESTIGATION

TWM NORTHEAST INC.
NORMANDEAU ENGINEERS CONCORD, NEW HAMPSHIRE

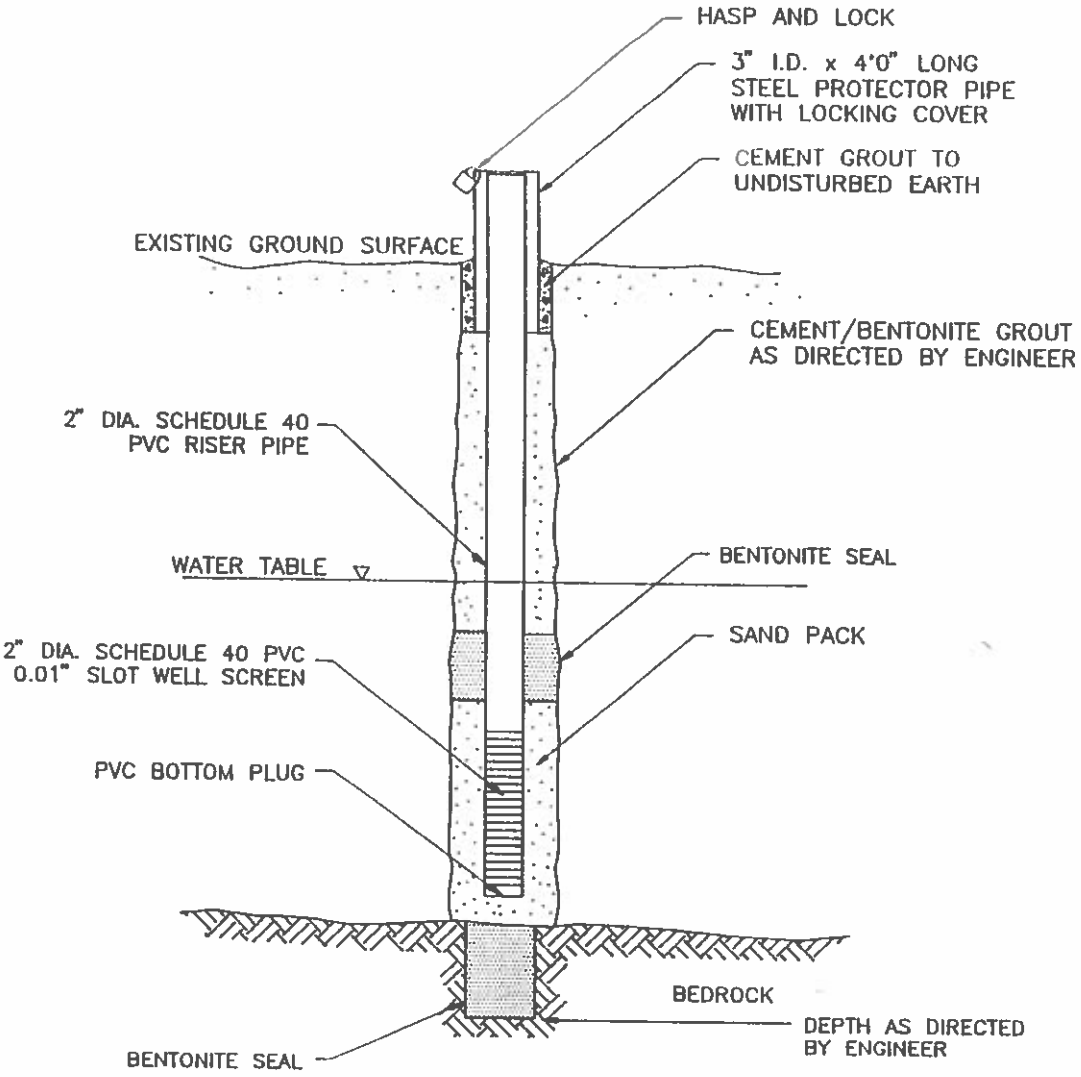
FIGURE 3

SITE LOCATION PLAN OF GROUND WATER MONITORING WELLS AND SURFACE WATER SAMPLING LOCATIONS EAST MILAN ROAD LANDFILL, BERLIN, NEW HAMPSHIRE

JUNE 1990



a.) SHALLOW



b.) DEEP

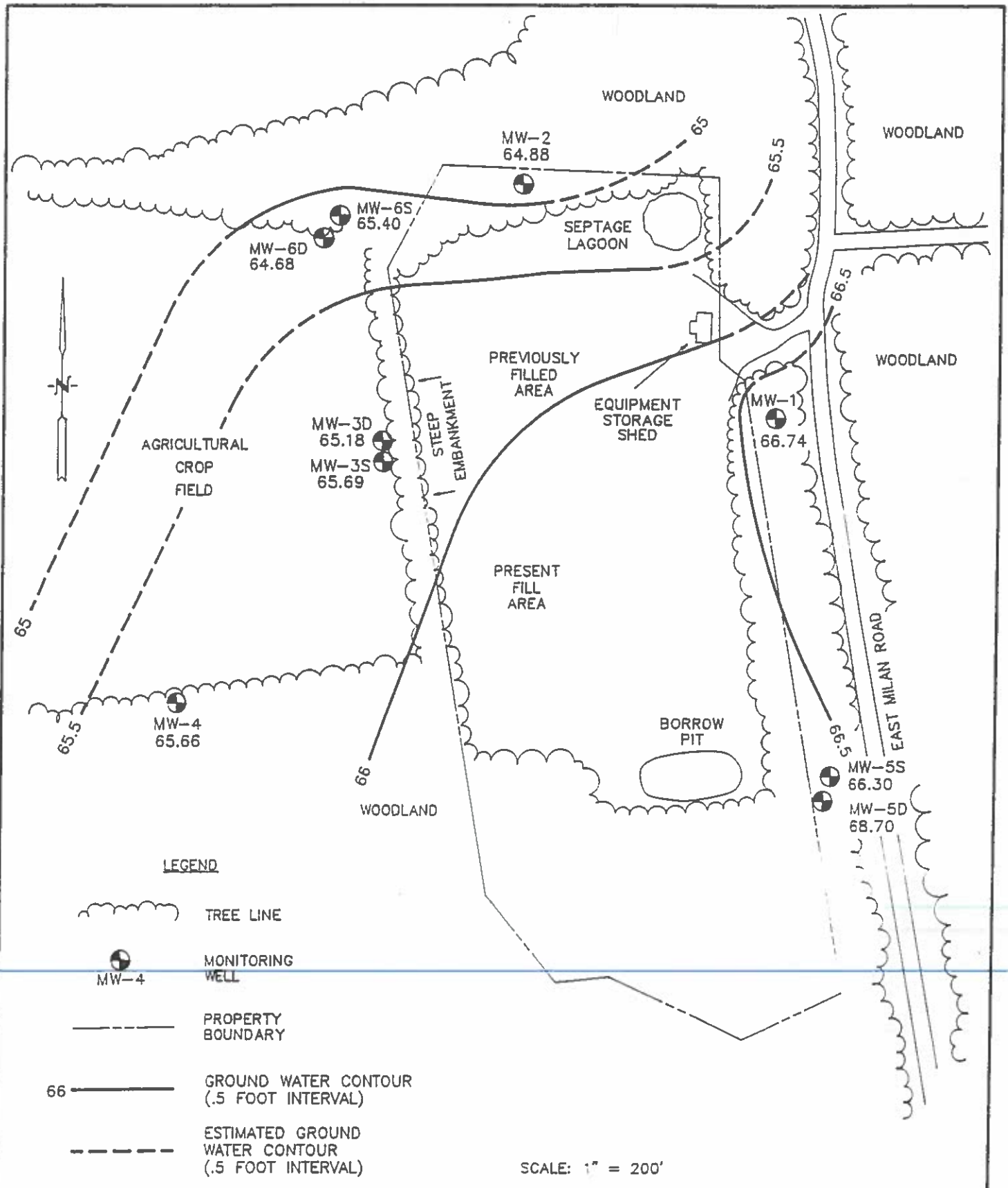
MWDTLS
SHAL-OU

CITY OF BERLIN, NEW HAMPSHIRE
PHASE II HYDROGEOLOGIC INVESTIGATION

TWM NORTHEAST INC.
NORMANDEAU ENGINEERS CONCORD, NEW HAMPSHIRE

FIGURE 4

TYPICAL CONSTRUCTION DETAILS FOR
a.) SHALLOW AND b.) DEEP GROUND WATER
MONITORING WELLS



0814-5

CITY OF BERLIN, NEW HAMPSHIRE
PHASE I HYDROGEOLOGIC INVESTIGATION

TWM NORTHEAST INC.
NORMANDEAU ENGINEERS CONCORD, NEW HAMPSHIRE

FIGURE 5

GROUND WATER ELEVATION CONTOUR MAP FOR
WATER LEVELS RECORDED APRIL 9, 1990
EAST MILAN ROAD LANDFILL, BERLIN, NEW HAMPSHIRE

JUNE 1990

425 TAYLOR ROAD
STOW, MASSACHUSETTS 01775
(617) 897-8737

SOIL EXPLORATION CORPORATION

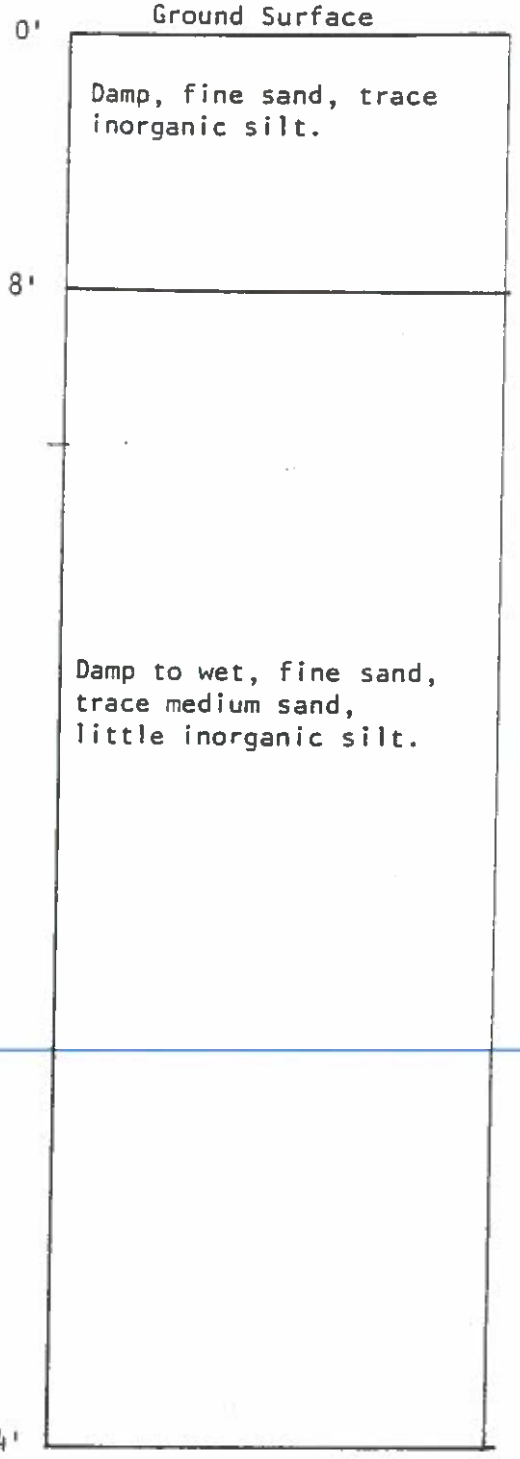
TEST BORINGS • GEOLOGICAL CONSULTING

OAK HILL PROFESSIONAL PA
LONDONDERRY, N.H. 0305
(603) 627-3051

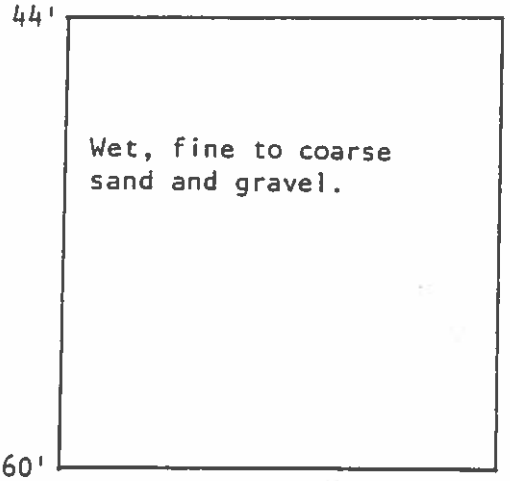
To City of Berlin, New Hampshire Date 5/15-16/84 Job No. 84-115

Location East Milan Rd. Sanitary Landfill, Berlin, N.H. Scale 1" = 6 ft.

Monitoring Well No. B-1
Ground Surface



well no. B-1 continued



End of boring 60'

Installed monitor well point at 58'

Water level 27' upon completion.

Materials used:
2 - 10' x 2" threaded slotted PVC
4 - 10' x 2" threaded blank PVC
1 - 2" threaded PVC end plug
1 - Protective locking casing
1 - Padlock
3 bags of sacrete
½ pail bentonite
½ bag silica sand

Standard Penetration Test - 140# hammer falling 30" - Blows are per 6" taken with 18" long x 2" O.D. x 1-3/8" I.D. Split Spoon Sampler unless otherwise noted.

Type of Boring - 2½" Casing ☐ 3½" Casing ☐ Hollow Stem Auger ☒ Solid Stem Auger ☐

Notes - Water levels indicated may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken. The following terms used in the soil descriptions are based on visual identification: Trace 0-10%, little or few 10-20%, Some 20-40%, and 40-50%.

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SOIL EXPLORATION CORPORATION

TEST BORINGS • GEOLOGICAL CONSULTING

OAK HILL PROFESSIONAL PAR
LONDONDERRY, N.H. 03053
(603) 627-3051

To City of Berlin, New Hampshire Date 5/22-23/84 Job No. 84-115

Location East Milan Rd. Sanitary Landfill, Berlin, N.H. Scale 1" = 6 ft.

Monitoring Well No. B-2A
Ground Surface

0'

Damp to wet, fine sand, little to some inorganic silt.

well no. B-2A continued

51'

End of boring 51'

Installed monitor well point at 51'

Water level 19' upon completion.

Materials used:
2 - 10' x 2" threaded slotted PVC
3 - 5' x 2" threaded blank PVC
1 - 2" threaded PVC end plug
1 - Protective locking casing
1 - 2" PVC cap
1 - padlock
2 bags sacrete
½ pail bentonite

Standard Penetration Test - 140# hammer falling 30" - Blows are per 6" taken with 18" long x 2" O.D. x 1-3/8" I.D. Split Spoon Sampler unless otherwise noted

Type of Boring - 2½" Casing ☐ 3½" Casing ☐ Hollow Stem Auger ☒ Solid Stem Auger ☐

Notes - Water levels indicated may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken. The following terms used in the soil descriptions are based on visual identification: Trace 0-10%, little or few 10-20%, Some 20-40%, and 40-60%.

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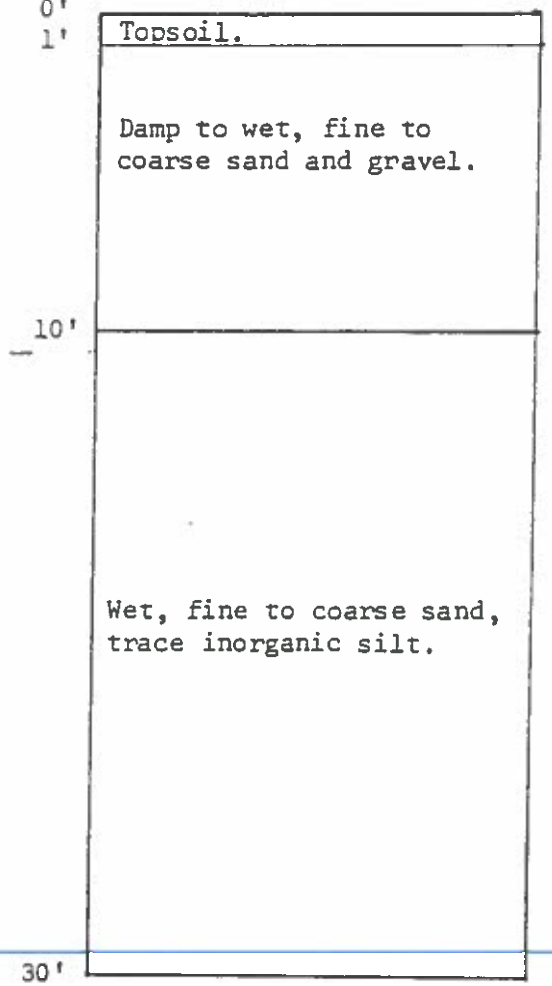
LONDONDERRY, N.H. 03053
(603) 627-3051

To City of Berlin, New Hampshire Date 5/16/84 Job No. 84-115

Location East Milan Rd. Sanitary Landfill Scale 1" = 6 ft.

Monitoring Well No. B-3
Ground Surface



End of boring 30'

Installed monitor well at 30'

Water level 7' upon completion.

Materials used:
2 - 10' x 2" threaded slotted PVC
1 - 10' x 2" threaded blank PVC
1 - 5' x 2" threaded blank PVC
1 - 2" threaded PVC end plug
1 - Protective locking casing
1 - Padlock
2 bags sacrete
½ pail bentonite

Standard Penetration Test - 140# hammer falling 30" - Blows are per 6" taken with 18" long x 2" O.D. x 1-3/8" I.D. Split Spoon Sampler unless otherwise noted.
Type of Boring - 2½" Casing ☐ 3¼" Casing ☐ Hollow Stem Auger ☒ Solid Stem Auger ☐

Notes - Water levels indicated may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken. The following terms used in the soil descriptions are based on visual identification: Trace 0-10%, little or few 10-20%, Some 20-40%, and 40-50%.

NORMANDEAU ENGINEERS INC
10 FERRY STREET, BOX 7
CONCORD, N.H. 03301
(603) 224-5770

TEST BORING LOG

BORING NUMBER MW-3 D

PROJECT East Milan Road Landfill
SHEET NO. 1 OF 3
CLIENT City of Berlin
PROJECT NO. 67001.11
BORING CONTRACTOR Con-Tec Incorporated
CASING ELEVATION
GROUND ELEVATION
DATE STARTED 9/12/89
DATE COMPLETED 9/20/89
DRILLER E. Poland
INSPECTOR R. Bettmeng

GROUND WATER			WELL	DRILL	SAMP	CORE
DATE	TIME	WATER DEPTH	TYPE	PVC CASING	SS	
			DIA.	1¼"	4"	2"
			WT.			140lb
			FALL			30"

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	2				SEE MW-3S FOR SOIL SAMPLE DESCRIPTIONS.		
	4						
	6						
	8						
	10						
	12						
	14						
	16						
	18						
	20						
	22						
	24						
	26						
	28						
	30	1	SS	6-5 5-5	MEDIUM, GREY, MEDIUM TO COARSE SAND WITH A TRACE OF FINE SAND		0.2
	32						
	34						
	36	2	SS	5-4 5-7	MEDIUM DENSE, GREY, FINE TO MEDIUM SAND		0.2
	38						
	40	3	SS	8-5 6-8	MEDIUM DENSE, GREY, FINE SAND	LEACHATE ODOR	14.0
	42						
	44						

NORMANDEAU ENGINEERS INC
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(603) 224-5770

TEST BORING LOG

BORING NUMBER MW-3D

PROJECT East Mialn Road Landfill

SHEET NO. 2 OF 3

CLIENT City of Berlin

PROJECT NO. 67001.11

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	46	4	SS	6-4 5-6	MEDIUM DENSE, GREY, FINE TO VERY FINE SAND	LECHATE ORDER	17.0
	48						
	50	5	SS	6-4 8-10	MEDIUM DENSE, GREY, VERY FINE SAND WITH TRACE SILT.		5.0
	52						
	54						
	56	6	SS	8-11 13-15	MEDIUM DENSE, GREY/BROWN VERY FINE SAND	STRATIFIED COLOR	6.8
	58						
	60	7	SS	10-11 13-15	MEDIUM DENSE, GREY/BROWN, VERY FINE SAND WITH TRACE SILT		0.8
	62						
	64						
	66	8	SS	13-11 21-29	HARD, GREY/BROWN, SILT WITH TRACE VERY FINE SAND		0.8
	68						
	70	9	SS	18-16 18-19	DENSE, GREY/BROWN VERY FINE SAND		0.7
	72						
	74						
	76	10	SS	14-21 37-48	VERY DENSE, GREY/BROWN VERY FINE SAND		0.4
	78						
	80	11	SS	25-38 50-50	VERY DENSE, GREY/BROWN, VERY FINE SAND		0.4
	82						
	84	12	SS	29-35 49-84	VERY DENSE, GREY, FINE SAND WITH SOME MEDIUM SAND		0.5
	86						
	88						
	90	13	SS	25-42 40-37	VERY DENSE, GREY, VERY FINE SAND		0.7
	92						
	94						

TWM NORMANDEAU ENGINEERS INC
10 FERRY STREET, BOX 7
CONCORD, N.H. 03301
(603) 224-5770

TEST BORING LOG

BORING NUMBER "W-3D

PROJECT East Milan Road Landfill
SHEET NO. 3 OF 3
CLIENT City of Berlin
PROJECT NO. 67001.11

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	96	14	SS	15-27 49-52	VERY DENSE, GREY, FINE TO MEDIUM SANDS		0.3
	98						
	100	15	SS	35-40 34-31	VERY DENSE GREY, FINE TO MEDIUM SAND		2.8
	102						
	104						
	106	16	SS	26-39 48-37	VERY DENSE, GREY, FINE TO MEDIUM SAND		14.0
	108					BEDROCK ENCOUNTERED 109.6 Ft.	
	110						
	112						
	114				END OF BORING 112.5 FT. WATER TABLE 11.63 FT.		

425 TAYLOR ROAD
STOW, MASSACHUSETTS 01775
(617) 897-8737

SOIL EXPLORATION CORPORATION

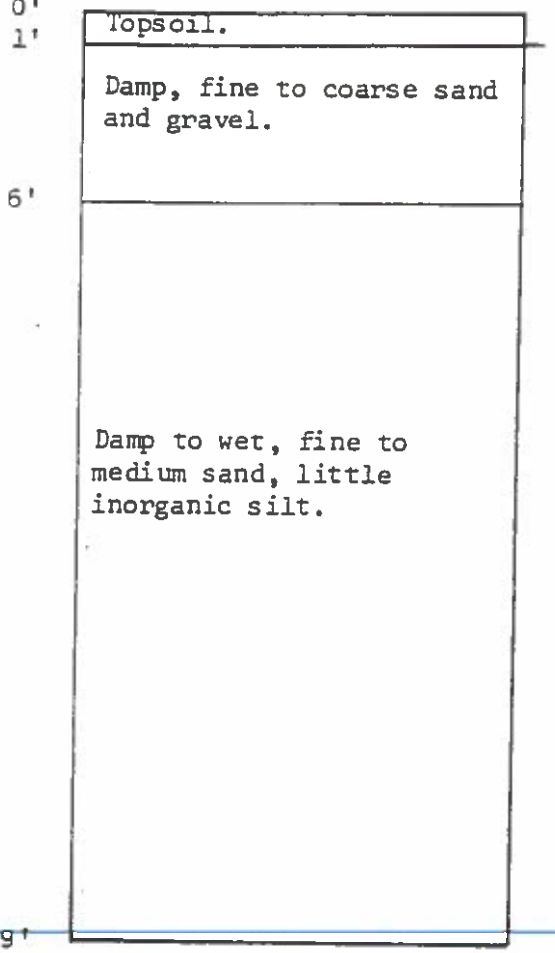
TEST BORINGS • GEOLOGICAL CONSULTING

OAK HILL PROFESSIONAL PA
LONDONDERRY, N.H. 0305
(603) 627-3051

To City of Berlin, New Hampshire Date 5/17/84 Job No. 84-115

Location East Milan Rd. Sanitary Landfill, Berlin, N.H. Scale 1" = 6 ft.

Monitoring Well No. B-4
Ground Surface



End of boring 29'

Installed monitor well point at 29'

Water level 9' upon completion.

Materials used:
~~2 - 10' x 2" threaded slotted PVC~~
1 - 10' x 2" threaded blank PVC
1 - 5' x 2" threaded blank PVC
1 - 2" threaded PVC end plug
1 - Protective locking casing
1 - Padlock
2 bags sacrete
½ pail bentonite

Standard Penetration Test - 140# hammer falling 30" - Blows are per 6" taken with 18" long x 2" O.D. x 1-3/8" I.D. Split Spoon Sampler unless otherwise noted.
Type of Boring - 2½" Casing ☐ 3½" Casing ☐ Hollow Stem Auger ☒ Solid Stem Auger ☐

Notes - Water levels indicated may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken. The following terms used in the soil descriptions are based on visual identification: Trace 0-10%, little or few 10-20%, Some 20-40%, and 40-50%.

TMM NORMANDEAU ENGINEERS INC
10 FERRY STREET, BOX 7
CONCORD, N.H. 03301
(603) 224-5770

TEST BORING LOG

BORING NUMBER MW-5S

PROJECT East Milan Road Landfill
SHEET NO. 1 OF 2
CLIENT City of Berlin
PROJECT NO. 67001.11
BORING CONTRACTOR Con-Tec Incorporated
CASING ELEVATION
GROUND ELEVATION
DATE STARTED 9/11/89
DATE COMPLETED 9/11/89
DRILLER E. Poland
INSPECTOR R. Bettmeng

GROUND WATER			WELL	DRILL	SAMP	CORE
DATE	TIME	WATER DEPTH	TYPE	PVC	HSA	SS	
			DIA.	2"	4¼"ID	2"	
			WT.		140lb		
			FALL		30"		

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm
	0				SEE MW-5D FOR SOIL SAMPLE DESCRIPTIONS.		
	2						
	4						
	6						
	8						
	10						
	12						
	14						
	16						
	18						
	20						
	22						
	24						
	26						
	28						
	30						
	32						
	34						
	36						
	38						
	40						
	42						
	44						

TVGM NORMANDEAU ENGINEERS INC
10 FERRY STREET, BOX 7
CONCORD, N.H. 03301
(603) 224-5770

TEST BORING LOG

BORING NUMBER MW-5S

PROJECT East Milan Road Landfill

SHEET NO. 2 OF 2

CLIENT City of Berlin

PROJECT NO. 67001.11

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	44						
	46						
	48						
	50				END OF BORING 50 FT.		
	52				WATER TABLE 40.5 FT.		

NORMANDEAU ENGINEERS INC
10 FERRY STREET, BOX 7
CONCORD, N.H. 03301
(603) 224-5770

TEST BORING LOG

BORING NUMBER MW-5D

PROJECT East Milan Road Landfill
SHEET NO. 1 OF 3
CLIENT City of Berlin
PROJECT NO. 67001.11
BORING CONTRACTOR Con-Tec Incorporated
CASING ELEVATION
GROUND WATER
GROUND ELEVATION
DATE STARTED 8/15/89
DATE COMPLETED 9/13/89
DRILLER M. Poland
INSPECTOR E. Crow/R. Bettmeng

DATE	TIME	WATER DEPTH		WELL	DRILL	SAMP	CORE
			TYPE	PVC	HSA	SS	NW
			DIA.	2"	4¼ID"	2"	3"
			WT.			140lb	
			FALL			30"	

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	0	1	SS	2-3	LOOSE, BROWN, FINE SAND WITH SOME ORGANICS	TOPSOIL 0.5 Ft.	
	2			3-4			0.2
	4				LOOSE, TAN, FINE SAND WITH TRACE SILT	DRY	
	6	2	SS	6			
	8			11-13	MEDIUM, DENSE, TAN, FINE TO MEDIUM SAND, LITTLE FINE GRAVEL, TRACE SILT	STRATIFIED	0.2
	10	3	SS	5	DENSE, TAN, FINE TO MEDIUM SAND AND SILT, TRACE FINE TO MEDIUM GRAVEL		
	12			12-21			0.8
	14			18			
	16	4	SS	5	MEDIUM DENSE, TAN, FINE TO MEDIUM SAND WITH SOME SILT		
	18			9-11			0.2
	20	5	SS	11			
	22			9	DENSE, TAN, FINE TO MEDIUM SAND		0.3
	24			13-17			
	26	6	SS	18	VERY DENSE TAN, FINE TO MEDIUM SAND		0.3
	28			10			
	30	7	SS	17-28	VERY DENSE, TAN, FINE TO COARSE SAND WITH TRACE FINE GRAVEL		0.2
	32			35			
	34	8	SS	15			
	36			22-20	VERY DENSE, TAN FINE TO COARSE SAND WITH TRACE GRAVEL		0.2
	38			39			
	40	9	SS	21			
	42			21-46	DENSE, GREY-BROWN, FINE TO COARSE SAND WITH SOME FINE GRAVEL	WET 41 Ft.	0.2
	44			45			
				4			
				13-16			
				20			

NORMANDEAU ENGINEERS INC	10 FERRY STREET, BOX 7 CONCORD, N.H. 03301 (603) 224-5770	TEST BORING LOG BORING NUMBER MW-5D
PROJECT East Milan Road Landfill		SHEET NO. 2 OF 3
CLIENT City of Berlin		PROJECT NO. 67001.11

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	46	10	SS	8 6-11 17	MEDIUM DENSE, GREY, MEDIUM TO COARSE SAND AND FINE TO MEDIUM GRAVEL		0.1
	48						
	50	11	SS	7 16-36 70	VERY DENSE, GREY, MEDIUM TO COARSE SAND AND FINE TO MEDIUM GRAVEL		0.2
	52						
	54	12	SS	10 4-7 20	MEDIUM DENSE, TAN, FINE TO COARSE SAND		0.1
	56						
	58						
	60	13	SS	5-6 25-26	DENSE, GREY, FINE TO COARSE SAND WITH TRACE SILT		0
	62						
	64						
	66	14	SS	7-7 14-31	DENSE, GREY, FINE TO COARSE SAND		0.2
	68						
	70	15	SS	9-30 81-100/0.3	VERY DENSE, GREY, FINE TO COARSE SAND, SOME FINE GRAVEL		0.1
	72						
	74						
	76	16	SS	51-96 100/0.2	VERY DENSE, GREY, FINE TO COARSE SAND AND GRAVEL		0
	78						
	80	17	SS	56-53 65-100/.02	VERY DENSE, GREY, FINE TO COARSE SAND AND FINE GRAVEL		0.2
	82						
	84				NO SAMPLE TAKEN DUE TO BORING CAVE-IN		
	86						
	88						
	90						
	92	18	SS	66-108	HARD, OLIVE, SILT WITH TRACE CLAY		0.1
	94						

NORMANDEAU ENGINEERS INC	10 FERRY STREET, BOX 7 CONCORD, N.H. 03301 (603) 224-5770	TEST BORING LOG BORING NUMRER MW-5D
PROJECT East Milan Road Landfill		SHEET NO. 3 OF 3
CLIENT City of Berlin		PROJECT NO. 67001.11

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	96 98 100 102 104 106 108 110				NO SPLIT SPOON SAMPLES TAKEN	BOULDER ENCOUNTERED 97.7' to 99' SAND AND GRAVEL ENCOUNTERED 99' to 102'. BOULDER ENCOUNTERED 102' to 102.7' SAND AND GRAVEL ENCOUNTERED 102.7' to 106.6' BEDROCK ENCOUNTERED 106.6 FT.	
	112				END OF BORING 110.4 FT. WATER TABLE 39 FT.		

TMM NORMANDEAU ENGINEERS INC
10 FERRY STREET, BOX 7
CONCORD, N.H. 03301
(603) 224-5770

TEST BORING LOG

BORING NUMBER MW-6S

PROJECT East Milan Road Landfill
CLIENT City of Berlin
BORING CONTRACTOR Con-Tec Incorporated
SHEET NO. 1 OF 1
PROJECT NO. 67001.11
CASING ELEVATION
GROUND ELEVATION
DATE STARTED 9/11/89
DATE COMPLETED 9/12/89
DRILLER E. Poland
INSPECTOR R. Bettmeng

GROUND WATER			WELL	DRILL	SAMP	CORE
DATE	TIME	WATER DEPTH	TYPE	PVC	HSA	SS
			DIA.	2"	4¼"ID	2"
			WT.			140lb
			FALL			30"

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	2	1A	SS	2-4 5-8	LOOSE, DARK BROWN, VERY FINE SAND WITH SOME SILT AND TRACE ORGANICS 0.5 FT.	TOPSOIL	0.4
	4	1B			MEDIUM DENSE, BROWN, FINE SAND WITH TRACE ORGANICS	DRY	0
	6	2	SS	6 6-11	MEDIUM DENSE TAN/BROWN FINE TO MEDIUM SAND WITH TRACE GRAVEL	8 Ft.	
	8			10			0
	10	3	SS	6-7	MEDIUM DENSE, TAN, FINE TO VERY FINE SAND		
	12			12-12			0.1
	14	4	SS	3-6	MEDIUM DENSE, WHITE/LIGHT TAN, FINE TO VERY FINE SAND		
	16			8-15			0
	18						
	20	5	SS	6-8	MEDIUM DENSE, WHITE/LIGHT TAN, FINE TO VERY FINE SAND		
	22			11-14			1.4
	24						
	26						
	28	6	SS	5-5 5-4	MEDIUM DENSE, GREY, FINE TO VERY FINE SAND	WET	1.3
	30						
	32	7	SS	4-6 6-9	MEDIUM DENSE, GREY, FINE TO VERY FINE SAND	LEACHATE ODOR	9
	34						
	36	8	SS	6-10 13-14	MEDIUM DENSE, GREY, VERY FINE SAND		6
	38				END OF BORING 37 FT. WATER TABLE 26 FT.		

NORMANDEAU ENGINEERS INC
10 FERRY STREET, BOX 7
CONCORD, N.H. 03301
(603) 224-5770

TEST BORING LOG

BORING NUMBER MW-6D

PROJECT East Milan Road Landfill
SHEET NO. 1 OF 3
CLIENT City of Berlin
PROJECT NO. 67001.11
BORING CONTRACTOR Con-Tec Incorporated
CASING ELEVATION
GROUND WATER
GROUND ELEVATION
DATE STARTED 9/13/89
DATE COMPLETED 9/21/89
DRILLER M. Poland
INSPECTOR R. Bettmeng

DATE	TIME	WATER DEPTH		WELL	DRILL	SAMP	CORE
			TYPE	PVC	HSA	SS	NW
			DIA.	1½"	4¼"	2"	3"
			WT.			140lb	
			FALL			30"	

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	2				SEE MW-6S FOR SOIL SAMPLE DESCRIPTIONS FROM 0 to 37 FT.		
	4						
	6						
	8						
	10						
	12						
	14						
	16						
	18						
	20						
	22						
	24						
	26						
	28						
	30						
	32						
	34						
	36				MEDIUM DENSE, GREY, VERY FINE SAND		
	38						
	40	10A	SS	5-7		STRATIFIED	3.2
	42	10B		8-11	VERY STIFF, GREY, SILT		4.6
	44						

NORMANDEAU ENGINEERS INC	10 FERRY STREET, BOX 7 CONCORD, N.H. 03301 (603) 224-5770	TEST BORING LOG
		BORING NUMBER MW-6D
PROJECT East Milan Road Landfill		SHEET NO. 2 OF 3
CLIENT City of Berlin		PROJECT NO. 67001.11

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	44						
	46	11	SS	7-8 9-8	MEDIUM DENSE, GREY, SILT		0.3
	48						
	50	12	SS	5-5 8-9	MEDIUM DENSE, GREY, SILT WITH TRACE OF VERY FINE SAND		0.2
	52						
	54						
	56	13	SS	4-6 9-10	MEDIUM DENSE, GREY, VERY FINE SAND		0.1
	58						
	60	14	SS	5-3 7-10	MEDIUM DENSE, GREY, VERY FINE SAND		0.1
	62						
	64						
	66	15	SS	11-18 16-17	DENSE, GREY / BROWN, VERY FINE SAND		0.2
	68						
	70	16	SS	11-10 18-26	DENSE, GREY, VERY FINE SAND		0.2
	72						
	74						
	76	17	SS	18-21 20-24	DENSE, GREY, VERY FINE SAND		0.1
	78						
	80	18	SS	8-12 17-16	DENSE, BROWN, FINE SAND WITH TRACE OF GRAVEL		1.0
	82						
	84						
	86	19	SS	10-18 15-18	NO RECOVERY		
	88						
	90						
	92	20	SS	7-15 13-13	MEDIUM DENSE, BROWN, FINE TO MEDIUM SAND WITH TRACE OF GRAVEL		0.8
	94						

NORMANDEAU ENGINEERS INC
10 FERRY STREET, BOX 7
CONCORD, N.H. 03301
(603) 224-5770

TEST BORING LOG

BORING NUMBER MW-6D

PROJECT East Milan Road Landfill

SHEET NO. 3 OF 3

CLIENT City of Berlin

PROJECT NO. 67001.11

WELL CONSTRUCTION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE BLOWS PER 6 INCHES	SAMPLE DESCRIPTION AND CLASSIFICATION	REMARKS	VOC (ppm)
	96	21	SS	34-21 13-11	MEDIUM DENSE, BROWN, COARSE SAND AND GRAVEL		0
	98						
	100	22	SS	26-28 41-43	VERY DENSE, BROWN, FINE TO COARSE SAND WITH SOME GRAVEL		0.2
	102						
	104						
	106	23	SS	27-37	VERY DENSE, GREY, FINE TO COARSE SAND WITH SOME GRAVEL	TILL BEDROCK ENCOUNTERED AT 108.7 FT.	0
	108						
	110						
	112						
	114						
	116						
	118						
	120				END OF BORING 118.5 FT. WATER TABLE 26 FT.		

CORING

TIME (MINUETE)	DEPTH (FT.)
7	113-114
6	114-115
4	115-116
3	116-117
4	117-118
3	118-118.5

TEST BORING LOG

CMA Engineers, Inc.
Civil/Environmental Engineers
35 Bow Street
Portsmouth, NH 03801
Phone: 603.431.6196
Fax: 603.431.5376

PROJECT
Description: East Milan Road LF
Location: E: 1118719.22180 N: 737481.24410
Notes: Top Casing: 1123.83' Top PVC: 1123.24'

Test Boring Number GP-6

Sheet 1 of 1

Contractor: Eastern Analytical
Date: 5/25/17

CMA Engineer: Jodie Strickland. P.E.
Equipment: Genuine Geoprobe
Ground Elevation: 1121.43'

File Number: 1061
Operator: Brian
Weather: Overcast, 50s (F)

Depth	Sample No. Depth (ft)	Blow Count	Sample Descriptions and Classifications	Well Diagram	Remarks
1			Loam		2' Bentonite
2			Gray, dry gravel		4" dia. auger
3					1.5" SCH 40 PVC
4			Wet clayey gravel organics (black) little gravel (dark brown)		7' of screen
5					
6					
7			Wet gravelly sand (brown) organics (black)		
8					
9					
10			Sandy gravel, wet (brown) dry gravel (dark brown)		10' well bottom
11	▽				
12			Refusal		11.5' bottom of boring
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

TEST BORING LOG

CMA Engineers, Inc.
Civil/Environmental Engineers
35 Bow Street
Portsmouth, NH 03801
Phone: 603.431.6196
Fax: 603.431.5376

PROJECT
Description: East Milan Road LF
Location: E: 1117651.23030 N: 737397.36180
Notes: Top Casing: 1113.90' Top PVC: 1113.72'

Test Boring Number GP-7

Sheet 1 of 1

Contractor: Eastern Analytical
Date: 5/25/17

CMA Engineer: Jodie Strickland. P.E.
Equipment: Genuine Geoprobe
Ground Elevation: 1111.45'

File Number: 1061
Operator: Brian
Weather: Overcast, 50s (F)

Depth	Sample No. Depth (ft)	Blow Count	Sample Descriptions and Classifications	Well Diagram	Remarks
1			Loam		2' Bentonite
2					4" dia. auger
3			Dry, sandy dark brown gravel (gray)		1.5" SCH 40 PVC
4					Screen SCH 40 PVC 6'
5					
6			Dry tan sand with some wet clay (gray)		
7					
8					
9	▽				9' well bottom
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

TEST BORING LOG

CMA Engineers, Inc.
Civil/Environmental Engineers
35 Bow Street
Portsmouth, NH 03801
Phone: 603.431.6196
Fax: 603.431.5376

PROJECT
Description: East Milan Rd. LF
Location: E: 1117673.22080 N: 736940.49840
Notes: Top Casing: 1112.25' Top PVC: 1111.76'

Test Boring Number GP-8

Sheet 1 of 1

Contractor: Eastern Analytical

Date: 5/24/17

CMA Engineer: Brad Sullivan, P.E.

Equipment: Geoprobe 4" dia. HSA

Ground Elevation: 1109.72'

File Number: 1061

Operator: Brian & Cameron

Weather: Partly cloudy, 70s (F)

Depth	Sample No. Depth (ft)	Blow Count	Sample Descriptions and Classifications	Well Diagram	Remarks
1–2			Dark brown top soil to 2.5'		2' Bentonite 4" dia. auger
3–4			Brown coarse to fine sand some stones, 3/4" minus		1.5" SCH 40 PVC Screen 1.5" SCH 40 PVC from 3' to 5'
5	▽				
6–25					

TEST BORING LOG

CMA Engineers, Inc.
Civil/Environmental Engineers
35 Bow Street
Portsmouth, NH 03801
Phone: 603.431.6196
Fax: 603.431.5376

PROJECT
Description: East Milan Rd. LF
Location: E: 1118067.91420 N: 736226.24640
Notes: Top Casing: 1122.64' Top PVC: 1122.47'

Test Boring Number GP-9

Sheet 1 of 1

Contractor: Eastern Analytical

Date: 5/24/17

CMA Engineer: Brad Sullivan, P.E.

Equipment: Geoprobe 4" dia. HSA

Ground Elevation: 1120.76'

File Number: 1061

Operator: Brian & Cameron

Weather: Partly cloudy, 70s (F)

Depth	Sample No. Depth (ft)	Blow Count	Sample Descriptions and Classifications	Well Diagram	Remarks
1			Dark brown organic topsoil to 12"		
2			Brown sand coarse to medium		2' Bentonite 4" dia. auger
3					1.5" SCH 40 PVC
4					
5			boulder @ 5'-10'		hard drilling to 10'
6					
7					Filter sand Holliston S1
8					
9					
10					Screen 1.5" SCH 40 PVC to 17' depth
11					
12			Brown cuttings coarse to fine sand		
13					
14			some stones 1" minus		
15					
16					
17					17' to bottom of well
18	▽				
19					Auger to 19' Back fill to 17'
20					
21					
22					
23					
24					
25					

TEST BORING LOG

CMA Engineers, Inc.
Civil/Environmental Engineers
35 Bow Street
Portsmouth, NH 03801
Phone: 603.431.6196
Fax: 603.431.5376

PROJECT
Description: East Milan Rd. LF
Location: E: 1118413.23900 N: 736123.59680
Notes: Top Casing: 1140.98' Top PVC: 1140.72'

Test Boring Number GP-10

Sheet 1 of 2

Contractor: Eastern Analytical

Date: 5/24/17

CMA Engineer: Brad Sullivan, P.E.

Equipment: Geoprobe 4" dia. HSA

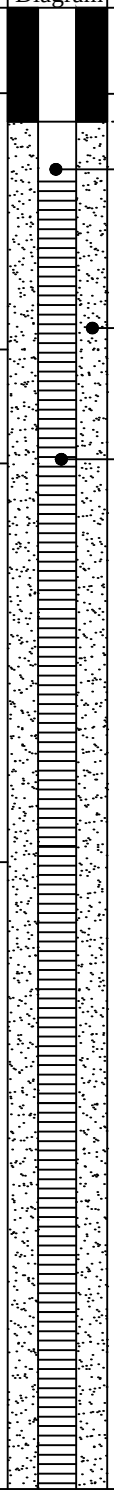
Ground Elevation: 1139.09'

File Number: 1061

Operator: Brian & Cameron

Weather: Partly cloudy, 70s (F)

Depth	Sample No. Depth (ft)	Blow Count	Sample Descriptions and Classifications	Well Diagram	Remarks
1–25			Brown organic topsoil to 18"		
			Boulders/spoils, stumps damp		2' Bentonite 4" dia. auger 1.5" SCH 40 PVC Filter sand Holliston S1
			Gray medium to fine sand		
			Dry medium to fine sand		Screen 1.5" SCH 40 PVC (29') to 32' depth
			Gray to tan course to fine sand		



TEST BORING LOG

CMA Engineers, Inc.
Civil/Environmental Engineers
35 Bow Street
Portsmouth, NH 03801
Phone: 603.431.6196
Fax: 603.431.5376

PROJECT
Description: East Milan Road LF
Location: E: 1118470.27620 N: 736029.69250
Notes: Top Casing: 1129.79' Top PVC: 1129.56'

Test Boring Number GP-10A

Sheet 1 of 1

Contractor: Eastern Analytical

Date: 5/25/17

CMA Engineer: Jodie Strickland. P.E.

Equipment: Genuine Geoprobe

Ground Elevation: 1127.34'

File Number: 1061

Operator: Brian

Weather: Overcast, 50s (F)

Depth	Sample No. Depth (ft)	Blow Count	Sample Descriptions and Classifications	Well Diagram	Remarks
1–5			Wet reddish topsoil		2' Bentonite; 4" dia. auger
2–5			Gray, pink, white gravel some sand, dry		1.5" SCH 40 PVC; Screen 1.5" SCH 40 PVC 20'
6–7			Tan gravelly sand loose, dry		
8–9			Sand (tan) some gravel chunks, dry		
10–12			Tan sand, dry gray gravel		
13			Tan fine sand, dry		
14			Tan sand, dry		
15–20			Fine tan sand		
21–23			Dry tan sand		23' well bottom
24 ▽			wet sand, gravel		
25					

SECTION 703 – AGGREGATES

Table 703-1 -- Required Grading, Graded Coarse Aggregates

Standard Stone Size	#4	#357	#467	#57	#67	#7	#89
Min to Max	3/4” to 1-1/2”	No. 4 to 2”	No. 4 to 1-1/2”	No. 4 to 1”	No. 4 to 3/4”	No. 4 to 1/2”	No. 16 to 3/8”
Sieve Size	**Percentage by Weight Passing**						
2-1/2”	---	100	---	---	---	---	---
2”	100	95-100	100	---	---	---	---
1-1/2”	90-100	---	95-100	100	---	---	---
1”	20-55	35-70	---	95-100	100	---	---
3/4”	0-15	---	35-70	---	90-100	100	---
1/2”	---	10-30	---	25-60	---	90-100	100
3/8”	0-5	---	10-30	---	20-55	40-70	90-100
No. 4	---	0-5	0-5	0-10	0-10	0-15	20-55
No. 8	---	---	---	0-5	0-5	0-5	5-30
No. 16	---	---	---	---	---	---	0-10
No. 50	---	---	---	---	---	---	0-5