Stamski And McNary, Inc.
Engineering - Planning – Surveying
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Drainage Calculations

For

MICMAC LANE
Nashoba Road
Acton, MA

JOSEPH
MARCH
CIVIL
#40472

December 31, 2007

Prepared For: James Kotanchik
48 Nashoba Road
Acton, MA 01720

SM-3727 File: 3727 Drainage.doc

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DRAINAGE SUMMARY

Drainage Summary

The site is located at 48 Nashoba Road in Acton, Massachusetts. The total acreage of the drainage subcatchments is 7.88± acres. The site will consist of a single entrance/exit off Nashoba Road to access the site. There are four (4) proposed residential dwellings and one existing residential dwellings with associated grading and appurtenances. The drainage system has been designed to serve the proposed subdivision.

Each swelling will be served by town water and an individual onsite sewage disposal system. Soil observations and percolation tests (4-15 mpi) have been conducted on site and a depth to ground water has been established across the site. Based on this average depth to groundwater and soil type (sandy loam) the proposed drainage basin has been designed to maintain a two foot offset to groundwater.

Micmac Lane has been designed as a Residential Compound in order to permit a small scale residential development which preserves the rural character of the town while minimizing the town maintenance responsibilities and costs which are normally associated with a public street following acceptance. Micmac Lane will remain a private way and the driveway and drainage system maintenance will be maintained by the homeowners.

In following the common driveway standards, we have been able to save the existing mature trees along Nashoba Road and the southern lot line adjacent to the first 400' of Micmac Lane. A high point in Micmac Lane has also been carefully selected to maintain the same subcatchment area currently draining into the Nashoba Road drainage system.

Instead of the first 470± feet of the existing driveway draining into Nashoba Road, the first 370± feet of Micmac Lane will drain into the same catch basin, thus maintaining approximately the same characteristics along the front of the site. Additional low growth dense vegetative cover will also be provided along the edge of the pasture to the north of Micmac Lane in front of the existing dwelling in order to mitigate the peak rate of runoff. Since there is no existing pavement draining towards the wetlands along the rear of the site within subcatchment 3, it is necessary to provide catch basins and a drainage basin to control the peak rate of runoff due to development for the turnaround area of Micmac Lane and the driveways associated with all the dwellings. The roof runoff will be directed to vegetated cover within the side and rear yards of the proposed dwellings. Once again, low growth dense vegetative cover will be provided along the back slope of the rear yards to minimize lawn area and provide for a reduced rate in runoff along the perimeter of the developed portion of the site.

All disturbed areas shall be loamed and seeded.

Peak rates of runoff for the 10 and 100-year storm events from the entire site have been analyzed for pre- and post conditions. (see attached calculations).

This site has been analyzed for the peak rate of discharge utilizing three drainage subcatchments for existing conditions. The site has been divided into multiple

subcatchments, based on proposed grading, for developed conditions. The surface water runoff rates have been analyzed to demonstrate that the proposed drainage system is properly sized to control the increase in runoff due to development to at or below pre-developed rates.

The proposed drainage system includes a deep sump and hooded catch basin, and an infiltration basin. It has been designed to include the proposed developed surface areas associated with the driveways, buildings, and appurtenances. The runoff within the private way will be collected by the deep sump and hooded catch basin, which directs the runoff into the infiltration basin. The proposed on-site drainage system is designed to recharge and control peak rates of runoff for the 10 and 100-year storm events, thus not increasing the peak rates of runoff due to development.

Existing Drainage Subcatchments
(See Pre-Development Drainage Map in the Rear of this Report)

1 To Eastern lot line/Nashoba Road – (Drainage System)
This subcatchment contains approximately 1.60± acres. There are areas of existing paved driveway, roofs, and grass as is indicated on the pre-development drainage map. The runoff from this subcatchment flows east towards Nashoba Road. Runoff is collected by the catch basin to the north near utility pole #22.

2 To Southern lot line
This subcatchment contains approximately 0.84± acres. There are areas of existing roofs, and grass, as is indicated on the pre-development drainage map. The runoff from this subcatchment flows south towards the stonewall located along the southern lot line.

3 To Onsite Wetlands – (Associated with Fort Pond Brook)
This subcatchment contains approximately 5.44± acres. There are areas of existing grass, brush, and trees as is indicated on the pre-development drainage map. The runoff from this subcatchment flows westerly towards the wetlands located along the western lot line.

Developed Drainage Subcatchments
(See Post-Development Drainage Map in the Rear of this Report)

1A To Eastern lot line/Nashoba Road – (Drainage System)
This 1.60± acre subcatchment consists of a portion of lawn from the existing lot (48 Nashoba Road), a portion of the roof from the existing lot, and a sections of the driveways for the existing lot. All runoff is directed overland to the eastern lot line and onto Nashoba road.

2A To Southern lot line

This subcatchment area contains approximately 0.35± acres. Runoff from this subcatchment is directed overland towards the southern lot line, similar to existing conditions.

3A To Onsite Wetlands – (Associated with Fort Pond Brook)

This subcatchment area contains approximately 4.32± acres. Runoff from this subcatchment is directed overland towards the western lot line and the onsite wetlands.

3B To Infiltration Basin

The subcatchment contains approximately 1.61± acres (total) which include the driveways for the proposed dwellings on Lot 2, 3, & 4, a portion of lawn area on all lots, and the entire paved area of the proposed private way. Runoff is directed via deep sump and hooded catch basins to infiltration basin one

Summary

The pre and post-development drainage calculations were compared for the site. By utilizing an Infiltration Basin the peak rates of runoff due to development will not exceed the pre-developed conditions. The storms considered for the analysis were the 10 and 100-year storm events. The catch basins will provide pretreatment measures with the use of deep sumps and hoods, and the infiltration basin is designed to meet the 100-year storm event.

The following is a summary of the pre and post-development peak rates of runoff:

	Pre-Development		Post-Development	
	10-year	100-year	10-year	100-year
	Peak Runoff	Peak Runoff	Peak Runoff	Peak Runoff
Subcatchment	(cfs)	(cfs)	(cfs)	(cfs)
1 (Pre-Dev.) 1A (Post-Dev.)	3.927	6.542	3.927	6.542
2 (Pre-Dev.) 2A (Post-Dev.)	1.942	3.457	1.032	1.693
3 (Pre-Dev.) 3A & 3B (Post-Dev.)	10.24	19.14	9.488	19.06

METHODOLOGY

Drainage Calculations:
The drainage from the site was analyzed using "Hydroflow Hydrographs 2007" computer software by inteliSOLVE. The program utilizes methods and formulas prescribed in the United States Department of Agriculture Soil Conservation Service (SCS) Technical Release 55 1986 Revised Version.

Pre-development surface water runoff rates were determined for the 10 and 100-year storm events for the site. Post-developed surface water runoff rates for the 10 and 100-year storm events were also evaluated for the site.

The proposed drainage basin and subsurface drainage area are designed to control the total peak rate of runoff for the 10 and 100-year storm events.

The site drainage has been sized using the Rational Method for the 100-year design storm event. All drainage pipes are to be constructed of ADS N12 polyethylene pipe.

DRAINAGE CALCULATIONS

(PRE-DEVELOPMENT)

Worksheet 2: Runoff curve number and runoff SM-3727

Project: MicMac Lane By RBB Date 10-16-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: **Present** Developed Subcatchment 1

1. Runoff curve number (CN)

Soil name and hydrologic soil group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN Table 2-2	CN Fig. 2-3	CN Fig. 2-4	Area Acres	Product of CN x Area
307B Paxton FSL C	Impervious area	98			0.07	6.86
307B Paxton FSL C	Open space (lawn), Good condition	74			0.33	24.42
307C Paxton FSL C	Impervious area	98			0.26	25.48
307C Paxton FSL C	Open space (lawn), Good condition	74			0.83	61.42
311B Woodbridge FSL C	Impervious area	98			0.11	10.78
				Totals =	1.6	128.96

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{128.96}{1.60} = 80.60$; Use CN = **80.6**

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency.....	yr	2	10	100
Rainfall, P (24-hour).....	in	3.1	4.5	6.4
Runoff, Q..... (Use P and CN with table 2-1, fig. 2-1,) or eqs. 2-3 and 2-4.)	in	1.36	2.51	4.21
Runoff, Q.....	cf	7925	14597	24437

D-2 (210-VI-TR-55, Second Ed., June 1986)

Worksheet 3: Time of Concentration (Tc) or travel time (Tt) **SM-3727**

Project: MicMac Lane By RBB Date 10-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present Developed
Circle one: Tc Tt through subarea Subcatchment 1

Sheet flow (Applicable to Tc only)		Segment ID	A-B			
1. Surface Description (table 3-1)			grass			
2. Mannings roughness coeff., n (table 3-1)			0.24			
3. Flow length, L (total L <= 300 ft)		ft	50			
4. Two-yr 24-hr rainfall, P2		in	3.1			
5. Land Slope, s		ft/ft	0.056			
6. Tt = 0.007 (nL)^0.8 / (P2^0.5 s^0.4)	Compute Tt	hr	0.09			0.09

Shallow concentrated Flow		Segment ID	B-C	C-D		
7. Surface Description (paved or unpaved)			unpaved	paved		
8. Flow Length, L		ft	478	434		
9. Watercourse slope, s		ft/ft	0.06	0.01		
10. Average Velocity, V (figure 3-1)		ft/s	3.89	1.92		
11. Tt = L / 3600V	Compute Tt	hr	0.03	0.06		0.10

Channel flow		Segment ID				
12. Cross sectional flow area, a		sf				
13. Wetted perimeter, pw		ft				
14. Hydraulic radius, r=a/wp	Compute r	ft				
15. Channel Slope, s		ft/ft				
16. Manning's roughness coeff., n						
17. V = 1.49 r^2/3 s^1/2 / n	Compute V	ft/s				
18. Flow length, L		ft				
19. Tt = L / 3600V	Compute Tt	hr				

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.19
min 11.3

(210-VI-TR-55, Second Ed., June 1986)

Worksheet 2: Runoff curve number and runoff SM-3727

Project: MicMac Lane By RBB Date 10-16-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: [Present] Developed Subcatchment 2

1. Runoff curve number (CN)

Soil name and hydrologic soil group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN Table 2-2	CN Fig. 2-3	CN Fig. 2-4	Area Acres	Product of CN x Area
307B Paxton FSL C	Impervious area	98			0.03	2.94
307B Paxton FSL C	Open space (lawn), Good condition	74			0.49	36.26
307C Paxton FSL C	Open space (lawn), Good condition	74			0.16	11.84
307D Paxton FSL C	Open space (lawn), Good condition	74			0.16	11.84
				Totals =	0.84	62.88

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{62.88}{0.84} = 74.86$; Use CN = 74.9

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency.....	yr	2	10	100
Rainfall, P (24-hour).....	in	3.1	4.5	6.4
Runoff, Q..... (Use P and CN with table 2-1, fig. 2-1,) or eqs. 2-3 and 2-4.)	in	1.02	2.04	3.61
Runoff, Q.....	cf	3107	6218	11011

D-2 (210-VI-TR-55, Second Ed., June 1986)

Worksheet 3: Time of Concentration (Tc) or travel time (Tt) **SM-3727**

Project: MicMac Lane By RBB Date 10-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present Developed
Circle one: Tc Tt through subarea Subcatchment 2

Sheet flow (Applicable to Tc only)		Segment ID	A-B			
1. Surface Description (table 3-1)			grass			
2. Mannings roughness coeff., n (table 3-1)			0.24			
3. Flow length, L (total L <= 300 ft)		ft	50			
4. Two-yr 24-hr rainfall, P2		in	3.1			
5. Land Slope, s		ft/ft	0.074			
6. Tt = 0.007 (nL)^0.8 / (P2^0.5 s^0.4)	Compute Tt	hr	0.08			0.08

Shallow concentrated Flow		Segment ID	B-C			
7. Surface Description (paved or unpaved)			unpaved			
8. Flow Length, L		ft	256			
9. Watercourse slope, s		ft/ft	0.05			
10. Average Velocity, V (figure 3-1)		ft/s	3.57			
11. Tt = L / 3600V	Compute Tt	hr	0.02			0.02

Channel flow		Segment ID				
12. Cross sectional flow area, a		sf				
13. Wetted perimeter, pw		ft				
14. Hydraulic radius, r=a/wp	Compute r	ft				
15. Channel Slope, s		ft/ft				
16. Manning's roughness coeff., n						
17. V = 1.49 r^2/3 s^1/2 / n	Compute V	ft/s				
18. Flow length, L		ft				
19. Tt = L / 3600V	Compute Tt	hr				

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.10
min 6.1

Worksheet 2: Runoff curve number and runoff SM-3727

Project: MicMac Lane By RBB Date 10-16-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: **Present** Developed Subcatchment 3

1. Runoff curve number (CN)

Soil name and hydrologic soil group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN Table 2-2	CN Fig. 2-3	CN Fig. 2-4	Area Acres	Product of CN x Area
307B Paxton FSL C	Open space (lawn), Good condition	74			0.14	10.36
307D Paxton FSL C	Open space (lawn), Good condition	74			2.81	207.94
307D Paxton FSL C	Brush - brush-weed-grass mixture, good condition	65			0.29	18.85
307D Paxton FSL C	Woods, good condition	70			2.20	154.00
				Totals =	5.44	391.15

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{391.15}{5.44} = 71.90$; Use CN = **71.9**

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency.....	yr	2	10	100
Rainfall, P (24-hour).....	in	3.1	4.5	6.4
Runoff, Q..... (Use P and CN with table 2-1, fig. 2-1,) or eqs. 2-3 and 2-4.)	in	0.86	1.81	3.31
Runoff, Q.....	cf	17048	35803	65437

D-2 (210-VI-TR-55, Second Ed., June 1986)

Worksheet 3: Time of Concentration (Tc) or travel time (Tt) **SM-3727**

Project: MicMac Lane By RBB Date 10-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present Developed
Circle one: Tc Tt through subarea Subcatchment 3

Sheet flow (Applicable to Tc only)		Segment ID	A-B			
1. Surface Description (table 3-1)			grass			
2. Mannings roughness coeff., n (table 3-1)			0.24			
3. Flow length, L (total L <= 300 ft)		ft	50			
4. Two-yr 24-hr rainfall, P2		in	3.1			
5. Land Slope, s		ft/ft	0.058			
6. Tt = 0.007 (nL)^0.8 / (P2^0.5 s^0.4)	Compute Tt	hr	0.09			0.09

Shallow concentrated Flow		Segment ID	B-C			
7. Surface Description (paved or unpaved)			unpaved			
8. Flow Length, L		ft	600			
9. Watercourse slope, s		ft/ft	0.14			
10. Average Velocity, V (figure 3-1)		ft/s	5.97			
11. Tt = L / 3600V	Compute Tt	hr	0.03			0.03

Channel flow		Segment ID				
12. Cross sectional flow area, a		sf				
13. Wetted perimeter, pw		ft				
14. Hydraulic radius, r=a/wp	Compute r	ft				
15. Channel Slope, s		ft/ft				
16. Manning's roughness coeff., n						
17. V = 1.49 r^2/3 s^1/2 / n	Compute V	ft/s				
18. Flow length, L		ft				
19. Tt = L / 3600V	Compute Tt	hr				

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.12
min 7.1

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	3.927	2	728	15,053	—	—	—	Sub 1
2	SCS Runoff	1.942	2	724	5,839	—	—	—	Sub 2
3	SCS Runoff	10.24	2	726	35,800	—	—	—	Sub 3
5	SCS Runoff	3.927	2	728	15,053	—	—	—	Sub 1A
6	SCS Runoff	1.032	2	724	3,087	—	—	—	Sub 2A
7	SCS Runoff	8.925	2	724	27,092	—	—	—	Sub 3A
8	SCS Runoff	4.124	2	726	14,087	—	—	—	Sub 3B
9	Reservoir	2.016	2	738	9,542	8	253.03	4,429	Basin
10	Combine	9.488	2	724	36,634	7, 9	—	—	Combine

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	6.542	2	728	25,201	—	—	—	Sub 1
2	SCS Runoff	3.457	2	724	10,335	—	—	—	Sub 2
3	SCS Runoff	19.14	2	726	65,432	—	—	—	Sub 3
5	SCS Runoff	6.542	2	728	25,201	—	—	—	Sub 1A
6	SCS Runoff	1.693	2	724	5,126	—	—	—	Sub 2A
7	SCS Runoff	16.50	2	724	49,299	—	—	—	Sub 3A
8	SCS Runoff	6.954	2	726	23,850	—	—	—	Sub 3B
9	Reservoir	4.528	2	734	18,572	8	253.69	6,146	Basin
10	Combine	19.06	2	724	67,870	7, 9	—	—	Combine

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 1

Sub 1

Hydrograph type	= SCS Runoff	Peak discharge	= 3.927 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 15,053 cuft
Drainage area	= 1.600 ac	Curve number	= 80.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 11.3 min
Total precip.	= 4.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time -- Outflow (min	cfs)
728	3.927 <<
730	3.893

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 1

Sub 1

Hydrograph type	= SCS Runoff	Peak discharge	= 6.542 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 15,053 cuft
Drainage area	= 1.600 ac	Curve number	= 80.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 11.3 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time – Outflow (min	cfs)
728	6.542 <<
730	6.444

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 2

Sub 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.942 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 5,839 cuft
Drainage area	= 0.840 ac	Curve number	= 74.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.1 min
Total precip.	= 4.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time – Outflow (min	cfs)
724	1.942 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 2

Sub 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.457 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 5,839 cuft
Drainage area	= 0.840 ac	Curve number	= 74.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.1 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time (min	Outflow cfs)
724	3.457 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 3

Sub 3

Hydrograph type	= SCS Runoff	Peak discharge	= 10.24 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 35,800 cuft
Drainage area	= 5.440 ac	Curve number	= 71.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 7.1 min
Total precip.	= 4.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time – Outflow (min	cfs)
726	10.24 <<
728	10.08

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 | Friday, Dec 21, 2007

Hyd. No. 3

Sub 3

Hydrograph type	= SCS Runoff	Peak discharge	= 19.14 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 35,800 cuft
Drainage area	= 5.440 ac	Curve number	= 71.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 7.1 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time – Outflow (min	cfs)
726	19.14 <<

...End

DRAINAGE CALCULATIONS

(POST-DEVELOPMENT)

Worksheet 2: Runoff curve number and runoff SM-3727

Project: MicMac Lane By DTH Date 12-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present **Developed** Subcatchment 1A

1. Runoff curve number (CN)

Soil name and hydrologic soil group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN Table 2-2	CN Fig. 2-3	CN Fig. 2-4	Area Acres	Product of CN x Area
307B Paxton FSL C	Impervious area	98			0.04	3.92
307B Paxton FSL C	Open space (lawn), Good condition	74			0.34	25.16
307C Paxton FSL C	Impervious area	98			0.33	32.34
307C Paxton FSL C	Open space (lawn), Good condition	74			0.68	50.32
307C Paxton FSL C	Brush - brush-weed-grass mixture, good condition	65			0.10	6.50
311B Woodbridge FSL C	Impervious area	98			0.11	10.78
				Totals =	1.6	129.02

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{129.02}{1.60} = 80.64$; Use CN = **80.6**

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency.....	yr	2	10	100
Rainfall, P (24-hour).....	in	3.1	4.5	6.4
Runoff, Q..... (Use P and CN with table 2-1, fig. 2-1,) or eqs. 2-3 and 2-4.)	in	1.37	2.52	4.21
Runoff, Q.....	cf	7939	14616	24460

D-2 (210-VI-TR-55, Second Ed., June 1986)

Worksheet 3: Time of Concentration (Tc) or travel time (Tt) **SM-3727**

Project: MicMac Lane By DTH Date 12-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present **Developed**

Circle one: **Tc** Tt through subarea Subcatchment 1A

Sheet flow (Applicable to Tc only)		Segment ID	A-B			
1. Surface Description (table 3-1)			grass			
2. Mannings roughness coeff., n (table 3-1)			0.24			
3. Flow length, L (total L <= 300 ft)		ft	50			
4. Two-yr 24-hr rainfall, P2		in	3.1			
5. Land Slope, s		ft/ft	0.056			
6. Tt = 0.007 (nL)^0.8 / (P2^0.5 s^0.4)	Compute Tt	hr	0.09			0.09

Shallow concentrated Flow		Segment ID	B-C	C-D		
7. Surface Description (paved or unpaved)			unpaved	paved		
8. Flow Length, L		ft	478	434		
9. Watercourse slope, s		ft/ft	0.06	0.01		
10. Average Velocity, V (figure 3-1)		ft/s	3.89	1.92		
11. Tt = L / 3600V	Compute Tt	hr	0.03	0.06		0.10

Channel flow		Segment ID				
12. Cross sectional flow area, a		sf				
13. Wetted perimeter, pw		ft				
14. Hydraulic radius, r=a/wp	Compute r	ft				
15. Channel Slope, s		ft/ft				
16. Manning's roughness coeff., n						
17. V = 1.49 r^2/3 s^1/2 / n	Compute V	ft/s				
18. Flow length, L		ft				
19. Tt = L / 3600V	Compute Tt	hr				

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.19 min 11.3

(210-VI-TR-55, Second Ed., June 1986)

Worksheet 2: Runoff curve number and runoff **SM-3727**

Project: MicMac Lane By DTH Date 12-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present **Developed** Subcatchment 2A

1. Runoff curve number (CN)

Soil name and hydrologic soil group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN Table 2-2	CN Fig. 2-3	CN Fig. 2-4	Area Acres	Product of CN x Area
307B Paxton FSL C	Open space (lawn), Good condition	74			0.04	2.96
307C Paxton FSL C	Impervious	98			0.02	1.96
307C Paxton FSL C	Open space (lawn), Good condition	74			0.09	6.66
307D Paxton FSL C	Impervious	98			0.09	8.82
307D Paxton FSL C	Open space (lawn), Good condition	74			0.11	8.14
				Totals =	0.35	28.54

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{28.54}{0.35} = 81.54$; Use CN = **81.5**

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency.....	yr	2	10	100
Rainfall, P (24-hour).....	in	3.1	4.5	6.4
Runoff, Q..... (Use P and CN with table 2-1, fig. 2-1,) or eqs. 2-3 and 2-4.)	in	1.43	2.60	4.31
Runoff, Q.....	cf	1813	3298	5473

D-2 (210-VI-TR-55, Second Ed., June 1986)

Worksheet 3: Time of Concentration (Tc) or travel time (Tt) **SM-3727**

Project: MicMac Lane By DTH Date 12-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present **Developed**

Circle one: **Tc** Tt through subarea Subcatchment 2A

Sheet flow (Applicable to Tc only)		Segment ID	A-B			
1. Surface Description (table 3-1)			smooth			
2. Mannings roughness coeff., n (table 3-1)			0.11			
3. Flow length, L (total L <= 300 ft)		ft	50			
4. Two-yr 24-hr rainfall, P2		in	3.1			
5. Land Slope, s		ft/ft	0.03			
6. Tt = 0.007 (nL)^0.8 / (P2^0.5 s^0.4)	Compute Tt	hr	0.06			0.06

Shallow concentrated Flow		Segment ID	B-C			
7. Surface Description (paved or unpaved)			unpaved			
8. Flow Length, L		ft	11			
9. Watercourse slope, s		ft/ft	0.05			
10. Average Velocity, V (figure 3-1)		ft/s	3.61			
11. Tt = L / 3600V	Compute Tt	hr	0.00			0.00

Channel flow		Segment ID				
12. Cross sectional flow area, a		sf				
13. Wetted perimeter, pw		ft				
14. Hydraulic radius, r=a/wp	Compute r	ft				
15. Channel Slope, s		ft/ft				
16. Manning's roughness coeff., n						
17. V = 1.49 r^2/3 s^1/2 / n	Compute V	ft/s				
18. Flow length, L		ft				
19. Tt = L / 3600V	Compute Tt	hr				

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.10 min 6.0

Worksheet 2: Runoff curve number and runoff SM-3727

Project: MicMac Lane By DTH Date 12-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present **Developed** Subcatchment 3A

1. Runoff curve number (CN)

Soil name and hydrologic soil group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN Table 2-2	CN Fig. 2-3	CN Fig. 2-4	Area Acres	Product of CN x Area
307D Paxton FSL C	Impervious	98			0.17	16.66
307D Paxton FSL C	Open space (lawn), Good condition	74			1.65	122.10
307D Paxton FSL C	Brush - brush-weed-grass mixture, good condition	65			0.29	18.85
307D Paxton FSL C	Woods, good condition	70			2.21	154.70
				Totals =	4.32	312.31

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{312.31}{4.32} = 72.29$; Use CN = **72.3**

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency.....	yr	2	10	100
Rainfall, P (24-hour).....	in	3.1	4.5	6.4
Runoff, Q..... (Use P and CN with table 2-1, fig. 2-1,) or eqs. 2-3 and 2-4.)	in	0.88	1.84	3.35
Runoff, Q.....	cf	13849	28891	52576

D-2 (210-VI-TR-55, Second Ed., June 1986)

Worksheet 3: Time of Concentration (Tc) or travel time (Tt) **SM-3727**

Project: MicMac Lane By DTH Date 12-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present **Developed**

Circle one: **Tc** Tt through subarea Subcatchment 3A

Sheet flow (Applicable to Tc only)		Segment ID	A-B			
1. Surface Description (table 3-1)			grass			
2. Mannings roughness coeff., n (table 3-1)			0.24			
3. Flow length, L (total L <= 300 ft)		ft	50			
4. Two-yr 24-hr rainfall, P2		in	3.1			
5. Land Slope, s		ft/ft	0.058			
6. Tt = 0.007 (nL)^0.8 / (P2^0.5 s^0.4)	Compute Tt	hr	0.09			0.09

Shallow concentrated Flow		Segment ID	B-C			
7. Surface Description (paved or unpaved)			unpaved			
8. Flow Length, L		ft	600			
9. Watercourse slope, s		ft/ft	0.14			
10. Average Velocity, V (figure 3-1)		ft/s	5.97			
11. Tt = L / 3600V	Compute Tt	hr	0.03			0.03

Channel flow		Segment ID				
12. Cross sectional flow area, a		sf				
13. Wetted perimeter, pw		ft				
14. Hydraulic radius, r=a/wp	Compute r	ft				
15. Channel Slope, s		ft/ft				
16. Manning's roughness coeff., n						
17. V = 1.49 r^2/3 s^1/2 / n	Compute V	ft/s				
18. Flow length, L		ft				
19. Tt = L / 3600V	Compute Tt	hr				

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.12 min 7.1

Worksheet 2: Runoff curve number and runoff **SM-3727**

Project: MicMac Lane By DTH Date 12-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present **Developed** Subcatchment 3B

1. Runoff curve number (CN)

Soil name and hydrologic soil group (appendix	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN Table 2-2	CN Fig. 2-3	CN Fig. 2-4	Area Acres	Product of CN x Area
307B Paxton FSL C	Impervious	98			0.10	9.80
307B Paxton FSL C	Open space (lawn), Good condition	74			0.55	40.70
307D Paxton FSL C	Impervious	98			0.26	25.48
307D Paxton FSL C	Open space (lawn), Good condition	74			0.70	51.80
				Totals =	1.61	127.78

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{127.78}{1.61} = 79.37$; Use CN = **79.4**

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency.....	yr	2	10	100
Rainfall, P (24-hour).....	in	3.1	4.5	6.4
Runoff, Q..... (Use P and CN with table 2-1, fig. 2-1,) or eqs. 2-3 and 2-4.)	in	1.29	2.41	4.08
Runoff, Q.....	cf	7511	14070	23829

D-2 (210-VI-TR-55, Second Ed., June 1986)

Worksheet 3: Time of Concentration (Tc) or travel time (Tt) **SM-3727**

Project: MicMac Lane By DTH Date 12-17-07

Location: Nashoba Road, Acton Checked _____ Date _____

Circle one: Present **Developed**

Circle one: **Tc** Tt through subarea Subcatchment 3B

Sheet flow (Applicable to Tc only)		Segment ID	A-B			
1. Surface Description (table 3-1)			grass			
2. Mannings roughness coeff., n (table 3-1)			0.24			
3. Flow length, L (total L <= 300 ft)		ft	50			
4. Two-yr 24-hr rainfall, P2		in	3.1			
5. Land Slope, s		ft/ft	0.03			
6. Tt = 0.007 (nL)^0.8 / (P2^0.5 s^0.4)	Compute Tt	hr	0.12			0.12

Shallow concentrated Flow		Segment ID	B-C	C-D		
7. Surface Description (paved or unpaved)			unpaved	paved		
8. Flow Length, L		ft	154	375		
9. Watercourse slope, s		ft/ft	0.03	0.06		
10. Average Velocity, V (figure 3-1)		ft/s	2.79	4.98		
11. Tt = L / 3600V	Compute Tt	hr	0.02	0.02		0.04

Channel flow		Segment ID				
12. Cross sectional flow area, a		sf				
13. Wetted perimeter, pw		ft				
14. Hydraulic radius, r=a/wp	Compute r	ft				
15. Channel Slope, s		ft/ft				
16. Manning's roughness coeff., n						
17. V = 1.49 r^2/3 s^1/2 / n	Compute V	ft/s				
18. Flow length, L		ft				
19. Tt = L / 3600V	Compute Tt	hr				

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)	hr	0.15
	min	9.3

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 | Friday, Dec 21, 2007

Hyd. No. 5

Sub 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 3.927 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 25,201 cuft
Drainage area	= 1.600 ac	Curve number	= 80.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 11.3 min
Total precip.	= 4.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time – Outflow (hrs	cfs)
12.13	3.927 <<
12.17	3.893

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 | Friday, Dec 21, 2007

Hyd. No. 5

Sub 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 6.542 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 25,201 cuft
Drainage area	= 1.600 ac	Curve number	= 80.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 11.3 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time -- Outflow (hrs	cfs)
12.13	6.542 <<
12.17	6.444

...End

Hydrograph Report

Hyd. No. 6

Sub 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 1.032 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 5,126 cuft
Drainage area	= 0.350 ac	Curve number	= 81.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 4.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time -- (hrs	Outflow cfs)
12.07	1.032 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 6

Sub 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 1.693 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 5,126 cuft
Drainage area	= 0.350 ac	Curve number	= 81.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time -- Outflow (hrs	cfs)
12.07	1.693 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 | Friday, Dec 21, 2007

Hyd. No. 7

Sub 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 8.925 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 49,299 cuft
Drainage area	= 4.320 ac	Curve number	= 72.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 4.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time -- (hrs	Outflow cfs)
12.07	8.925 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 7

Sub 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 16.50 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 49,299 cuft
Drainage area	= 4.320 ac	Curve number	= 72.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time – Outflow (hrs	cfs)
12.07	16.50 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 | Friday, Dec 21, 2007

Hyd. No. 8

Sub 3B

Hydrograph type	= SCS Runoff	Peak discharge	= 4.124 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 23,850 cuft
Drainage area	= 1.610 ac	Curve number	= 79.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 9.3 min
Total precip.	= 4.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time -- (hrs)	Outflow (cfs)
12.10	4.124 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 | Friday, Dec 21, 2007

Hyd. No. 8

Sub 3B

Hydrograph type	= SCS Runoff	Peak discharge	= 6.954 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 23,850 cuft
Drainage area	= 1.610 ac	Curve number	= 79.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 9.3 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time – Outflow (hrs	cfs)
12.10	6.954 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 9

Basin

Hydrograph type	= Reservoir	Peak discharge	= 2.016 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 18,572 cuft
Inflow hyd. No.	= 8 - Sub 3B	Reservoir name	= Infiltration Basi
Max. Elevation	= 253.03 ft	Max. Storage	= 4,429 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.27	2.293	253.03	0.541	—	—	—	1.467	—	—	—	0.106	2.008
12.30	2.056	253.03 <<	0.544	—	—	-----	1.472	—	-----	-----	0.106	2.016 <<
12.33	1.892	253.02	0.536	-----	—	—	1.461	—	—	—	0.106	1.996

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Hyd. No. 9

Basin

Hydrograph type	= Reservoir	Peak discharge	= 4.528 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 18,572 cuft
Inflow hyd. No.	= 8 - Sub 3B	Reservoir name	= Infiltration Basi
Max. Elevation	= 253.69 ft	Max. Storage	= 6,146 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.20	5.133	253.68	1.642	—	—	—	2.867	—	—	—	0.127	4.509
12.23	4.341	253.69 <<	1.650	—	—	—	2.878	—	—	—	0.127	4.528 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 Friday, Dec 21, 2007

Hyd. No. 10

Combine

Hydrograph type	= Combine	Peak discharge	= 9.488 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 67,870 cuft
Inflow hyds.	= 7, 9	Contrib. drain. area	= 4.320 ac

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time (hrs)	Hyd. 7 + (cfs)	Hyd. 9 = (cfs)	Outflow (cfs)
12.07	8.925 <<	0.563	9.488 <<

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22 Friday, Dec 21, 2007

Hyd. No. 10

Combine

Hydrograph type	= Combine	Peak discharge	= 19.06 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 67,870 cuft
Inflow hyds.	= 7, 9	Contrib. drain. area	= 4.320 ac

Hydrograph Discharge Table

(Printed values >= 98.00% of Qp.)

Time (hrs)	Hyd. 7 + (cfs)	Hyd. 9 = (cfs)	Outflow (cfs)
12.07	16.50 <<	2.567	19.06 <<

...End

Pond Report

Hydraflow Hydrographs by Intelisolve v9.22 — Friday, Dec 21, 2007

Pond No. 3 - Infiltration Basin

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 250.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	250.00	707	0	0
1.00	251.00	1,121	914	914
2.00	252.00	1,737	1,429	2,343
3.00	253.00	2,277	2,007	4,350
4.00	254.00	2,957	2,617	6,967

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 10.00	0.00	0.00	0.00
Span (in)	= 10.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 252.50	0.00	0.00	0.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 0.20	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 250.90	0.00	0.00	0.00
Weir Coeff.	= 0.22	3.33	3.33	3.33
Weir Type	= 10 degV	—	—	—
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 2.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	250.00	0.00	—	—	—	—	—	—	—	0.000	—	0.000
1.00	914	251.00	0.00	—	—	—	0.00	—	—	—	0.052	—	0.053
2.00	2,343	252.00	0.00	—	—	—	0.28	—	—	—	0.080	—	0.362
3.00	4,350	253.00	0.50 oc	—	—	—	1.42	—	—	—	0.105	—	2.029
4.00	6,967	254.00	2.15 oc	—	—	—	3.76	—	—	—	0.137	—	6.041

STORM SEWER DESIGN

DESIGN STORM: 100 YEAR
DATE: 12/19/07
DONE BY: DTH
FILE: 3727 RATIONAL METHOD.wb3

STORM SEWER DESIGN

(ADS N-12)"n"= 0.010 (4"-10")
(ADS N-12)"n"= 0.012
(Cast Iron)"n"= 0.011

PROJECT: SM-3727
LOCATION: ACTON, MA

FROM	TO	LENGTH (FT)	TRIBUTARY AREA INCR. (ACRES)	TRIBUTARY AREA TOTAL (ACRES)	TIME OF FLOW TO UPPER END (MIN)	TIME OF FLOW TIME IN SECTION (MIN)	RUNOFF COEFF. "C"	RAINFALL INTENSITY (IN/HR)	"Q" TOTAL RUNOFF (CFS)	SLOPE of PIPE (FT/FT)	DIAM (IN)	MANN. "n"	CAPACITY FULL (CFS)	VELOCITY FULL (FPS)	DESIGN FLOW VELOCITY (FPS)	DESIGN FLOW VELOCITY HEAD (FT)	DESIGN FLOW DEPTH OF FLOW (FT)	DESIGN FLOW TOTAL ENERGY HEAD (FT)	MANHOLE INVERT DROP (FT)	FALL IN PIPE (FT)	DRAIN INV. ELEVATION UPPER END	DRAIN INV. ELEVATION LOWER END	GROUND SURFACE UPPER END	GROUND SURFACE LOWER END
CB-1	DMH-1	68	0.25	0.25	10	0.03	0.48	7.6	0.91	0.019	12	0.012	5.33	6.79	5.07	0.40	0.28	0.68		1.30	269.80	268.50	274.30	273.50
CB-2	DMH-1	37	0.55	0.55	10	0.02	0.48	7.6	1.90	0.022	12	0.012	5.66	7.22	6.50	0.66	0.40	1.05		0.80	269.30	268.50	273.80	273.50
DMH-1	DMH-5	89	0.00	1.31	10	0.13	0.30	7.6	2.76	0.071	12	0.012	10.23	13.04	11.06	1.90	0.35	2.26		6.00	268.50	262.50	273.50	267.50
CB-3	DMH-4	8	0.39	0.39	10	0.02	0.41	7.6	1.22	0.063	12	0.012	9.63	12.27	8.39	1.09	0.24	1.33		0.50	263.00	262.50	266.50	267.50
DMH-4	DMH-3	71	0.00	1.60	10	0.15	0.35	7.6	4.01	0.021	12	0.012	5.60	7.13	7.76	0.93	0.63	1.56		1.50	262.50	261.00	267.50	272.50
DMH-3	DMH-2	69	0.00	1.60	10	0.10	0.35	7.6	4.01	0.058	12	0.012	9.28	11.82	11.39	2.01	0.46	2.47		4.00	261.00	257.00	272.50	261.00
DMH-2	DMH-5	108	0.00	1.60	10	0.18	0.35	7.6	4.01	0.042	12	0.012	7.86	10.02	10.07	1.57	0.51	2.08		4.50	257.00	252.50	261.00	254.50

CB CATCH BASIN
DMH DRAIN MANHOLE
SUB INF. SUBSURFACE INFILTRATION

Closed Drainage System

Project: MICMAC LANE By DTH Date 12/19/07

Location: ACTON, MA Checked _____ Date _____

Rational Method

Q = peak flow rate, (cfs) i = rainfall intensity inches/hour

C = runoff coefficient, A = area (ac)

C = 0.90 impervious

C = 0.20 landscaped / grass

C = 0.15 woods

CB-1

Surface Cover	A (ac)	C	Product A x C
impervious	0.098	0.90	0.088
lands/grass	0.148	0.20	0.030
woods	0.000	0.15	0.000
sum =	0.246	sum =	0.118

C = **0.48** = total product / total area

CB-2

Surface Cover	A (ac)	C	Product A x C
impervious	0.079	0.90	0.071
lands/grass	0.881	0.20	0.176
woods	0.000	0.15	0.000
sum =	0.960	sum =	0.247

C = **0.26** = total product / total area

Project: MICMAC LANE By DTH Date 12/19/07

Location: ACTON, MA Checked _____ Date _____

Rational Method

Q = peak flow rate, (cfs) i = rainfall intensity inches/hour

C = runoff coefficient, A = area (ac)

C = 0.90 impervious

C = 0.20 landscaped / grass

C = 0.15 woods

DMH-1

Surface Cover	A (ac)	C	Product A x C
CB-1	0.246	0.48	0.118
CB-2	0.960	0.26	0.250
sum =	1.206	sum =	0.368

C = **0.30** = total product / total area

CB-3

Surface Cover	A (ac)	C	Product A x C
impervious	0.118	0.90	0.106
lands/grass	0.272	0.20	0.054
woods	0.000	0.15	0.000
sum =	0.390	sum =	0.161

C = **0.41** = total product / total area

Closed Drainage System

Project: MICMAC LANE By DTH Date 12/19/07

Location: ACTON, MA Checked _____ Date _____

Rational Method

Q = peak flow rate, (cfs)

i = rainfall intensity inches/hour

C = runoff coefficient,
C = 0.90 impervious
C = 0.20 landscaped / grass
C = 0.15 woods

A = area (ac)

DMH-3

Surface Cover	A (ac)	C	Product A x C
CB-3	0.390	0.41	0.160
DMH-2	1.206	0.30	0.362
sum =	1.596	sum =	0.522

C = **0.33** = total product / total area

DMH-4

Surface Cover	A (ac)	C	Product A x C
DMH-3	1.596	0.33	0.527
sum =	1.596	sum =	0.527

C = **0.33** = total product / total area

DMH-5

Surface Cover	A (ac)	C	Product A x C
DMH-4	1.596	0.33	0.527
sum =	1.596	sum =	0.527

C = **0.33** = total product / total area

EARTH REMOVAL CALCULATIONS

CUT AND FILL ANALYSIS

Job No.: SM-3727

Location: Definitive Subdivision
Micmac Lane
Nashoba Road
Acton, MA

Date: December 19, 2007

Based on: Plan dated December 31, 2007
Prepared By: Stamski And McNary, Inc.

Calculated by: Stamski and McNary, Inc.

Site Volume Table:

Cut (C.Y.)	Fill (C.Y.)	Net (C.Y.)	Method
4047	1612	2435 (C)	Average Volumes

Average Volume = 2,435 CY (less construction materials)

CONSTRUCTION MATERIALS:

BITUMINOUS CONCRETE:	19,746 SF x 3.0 INCH/(12 x 27)	= -183 CY
GRAVEL BASE:	19,746 SF x 1.0 FT/(27)	= -731 CY
	TOTAL MATERIAL	**= -914 CY**

3,349 cy [2,435 + 914] of cut material to be used on site for houses and grading.

WATER BALANCE CALCULATIONS

Water Balance Calculations

The site is located within Groundwater Protection District Zones 4. It is serviced by town water and onsite sewage disposal. Therefore, sewage recharge is included in the water balance calculations. The drainage from the site was analyzed using "Hydroflow Hydrographs 2007" computer software by inteliSOLVE. The program generated runoff volumes for predevelopment and post-development conditions. As can be seen from the following calculations the water balance requirement is satisfied.

Water Balance Calculations SM-3727

Project: Micmac Lane By DTH Date 12/17/07

Location: off Nashoba Road, Acton, MA Checked RJH Date

Circle one: Present Developed

Infiltration for Subcatchment 1

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN	Area	Infiltration Rate in/yr	Infiltration Volume cf/yr
C	Impervious (...roofs, driveways...)	98	0.440	0	0
C	Open Space (lawn) Good Condition	74	1.160	16.8	70741
				Totals =	70741

Infiltration for Subcatchment 2

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN	Area	Infiltration Rate in/yr	Infiltration Volume cf/yr
C	Impervious (...roofs, driveways...)	98	0.03	0	0
C	Open Space (lawn) Good Condition	74	0.81	16.8	49,397
				Totals =	49,397

Infiltration for Subcatchment 3

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN	Area	Infiltration Rate in/yr	Infiltration Volume cf/yr
C	Open Space (lawn) Good Condition	74	2.95	16.8	179,903
C	Brush - brush-weed-grass mixture, good condition	65	0.29	18	18,949
C	Woods, good condition	70	2.20	16.8	134,165
				Totals =	333,016

Total Pre-Development Infiltration (cf/yr) = 382,413

Water Balance Calculations **SM-3727**

Project: Micmac Lane By DTH Date 12/17/07

Location: off Nashoba Road, Acton, MA Checked RJH Date

Circle one: Present **Developed**

Infiltration for Subcatchment 1A

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN	Area	Infiltration Rate in/yr	Infiltration Volume cf/yr
C	Impervious (...roofs, driveways...)	98	0.48	0	0
C	Brush - brush-weed-grass mixture, good condition	65	0.10	18	6534
C	Open Space (lawn) Good Condition	74	1.02	16.8	62204
				Totals =	68738

Infiltration for Subcatchment 2A

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN	Area	Infiltration Rate in/yr	Infiltration Volume cf/yr
C	Impervious (...roofs, driveways...)	98	0.11	0	0
C	Open Space (lawn) Good Condition	74	0.24	16.8	14636
				Totals =	14636

Infiltration for Subcatchment 3A

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN	Area	Infiltration Rate in/yr	Infiltration Volume cf/yr
C	Impervious (...roofs, driveways...)	98	0.17	0	0
C	Woods (Good Condition)	70	2.21	17.5	140390
C	Open Space (lawn) Good Condition	74	1.65	16.8	100624
C	Brush - brush-weed-grass mixture, good condition	65	0.29	14.0	14738
				Totals =	255752

Infiltration for Subcatchment 3B

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN	Area	Infiltration Rate in/yr	Infiltration Volume cf/yr
C	Impervious (...roofs, driveways...)	98	0.36	0	0
C	Open Space (lawn) Good Condition	74	1.25	16.8	76230
				Totals =	76230

Septic System Infiltration
4 Proposed Lots x 440 GPD/Lot x 1 CF/7.48 Gal x 365 Days/Year (cf/yr) 85,882

Total Post Development Inf. (Subcatchment 1A+1B+2A+2B+Septic System Inf.) (cf/yr) = 501,237

Total Pre Development Inf. (cf/yr) = 382,413

501,237 > 382,413

O.K.

SOIL LOGS

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

DEP has provided this form for use by on-site professionals and local Boards of Health. Other forms may be used, but the information must be substantially the same as provided here. Before using this form, check with your local Board of Health to determine the form they use.

A. Facility Information

1. Facility Information

Owner Name: JIM KOTANCHIK

Street Address: 48 NASHOBA ROAD Map/Lot: 02/15-1

City/Town: ACTON State: MA Zip Code: 01720

TEST PITS 1-12, 21 & 22
PERC TESTS
PT 1, 4, 6, 7, 9, 10 & 21

B. Site Information

1. (Check one) New Construction ☒ Upgrade ☒ Repair ☐

2. Published Soil Survey available? Yes ☐ No ☐ If yes: Year Published ____ Publication Scale ____ Soil Map Unit ____

Soil Name ____ Soil limitations ____

3. Surficial Geological Report available? Yes ☐ No ☒ If yes: Year Published ____ Publication Scale ____ Map Unit ____

Geologic Material ____ Landform ____

4. Flood Rate Insurance Map:

Above the 500 year flood boundary? Yes ☒ No ☐ Within the 100 year flood boundary? Yes ☐ No ☒

Within the 500 year flood boundary? Yes ☐ No ☒ Within a Velocity Zone? Yes ☐ No ☒

5. Wetland Area: National Wetland Inventory Map — Map Unit: WETLANDS FLAGGED ON SITE Name: ____

Wetlands Conservancy Program Map — Map Unit: ____ Name: ____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number ACTON

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

STAMSKI AND MCNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

   Deep Hole Number TP-1 Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: FIELD HORSE CORRAL (e.g. woodland, agricultural field, vacant lot, etc.) <2% (Surface Stones) 5 (Slope (%))

   BRUSH (Vegetation) _____ (Landform) _____ (Position on landscape (attach sheet))

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area — feet

   Property Line — feet Drinking Water Well — feet Other —

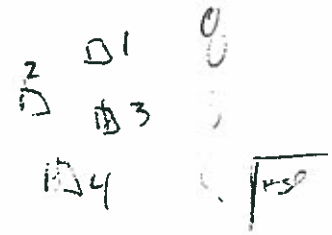
4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: 50 (inches) _____ (elevation)



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number ACTON

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole A: Deep Hole Number: TP-1

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 3/2	–	–	–	SL	–	5	M	F	
24	B	10YR 5/6	–	–	–	SL	–	5	M	F	
120	C	2.5Y 6/3	50	5YR 5/8	>	SL	–	5	M	F	

Additional Notes PIPE

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-2 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ (Surface Stones) 5 (Slope (%))

BRUSH (Vegetation) _____ (Landform) _____ (Position on landscape (attach sheet))

3. Distances from: Open Water Body — (feet) Drainage Way — (feet) Possible Wet Area — (feet)

Property Line _____ (feet) Drinking Water Well — (feet) Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit 100 Depth Standing Water in Hole 116

Estimated Depth to High Groundwater: 55 (inches) _____ (elevation)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 MASHOBA ROAD
Site Address or Map/Lot Number
ACTON

Deep Observation Hole A: Deep Hole Number: TP-2

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
7	A	10YR 3/2	—	—	—	SL	—	S	M	F	
22	B	10YR 5/6	—	—	—	SL	—	—	M	F	
120	C	2.5Y 6/3	55	5YR 5/8	>5	SL	—	S	M	F	

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-3 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) _____

Vegetation BUSH _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area >100 feet

Property Line _____ feet Drinking Water Well — feet Other —

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

Estimated Depth to High Groundwater: 48 inches _____ elevation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number
ACTON

Deep Observation Hole A: Deep Hole Number: TP-3

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 3/2	—	—	—	SL	—	5	M	F	
20	B	10YR 5/6	—	—	—	SL	—	—	M	F	
96	C	2.5Y 4/3	48	5YR 5/8	>5	SL	—	5	M	F	
96	R										

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-4 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ (Surface Stones) 5+ (Slope (%))

BRUSH (Vegetation) _____ (Landform) _____ (Position on landscape (attach sheet))

3. Distances from: Open Water Body — (feet) Drainage Way — (feet) Possible Wet Area >100 (feet)

Property Line _____ (feet) Drinking Water Well — (feet) Other —

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

Estimated Depth to High Groundwater: 66 (Inches) _____ (elevation)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number
ACTON

Deep Observation Hole A: Deep Hole Number: TP-4

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
7	A	10YR 3/2	—	—	—	SL	—	5	M	F	
22	B	10YR 5/6	—	—	—	SL	—	—	M	F	
120	C	2.5Y 6/3	66	5YR 5/8	15	SL	—	5	M	F	

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number: ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-5 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) 5

Vegetation BANSH Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — (feet) Drainage Way — (feet) Possible Wet Area >100 (feet)

Property Line 50+ (feet) Drinking Water Well — (feet) Other —

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

Estimated Depth to High Groundwater: 30 (Inches) _____ (elevation)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number: 48 & 50 NASHOBA ROAD ACTON

Deep Observation Hole A: Deep Hole Number: TP-5

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6	A	10YR 3/2	—	—	—	SL	—	5	M	F	
20	B	10YR 5/6	—	—	—	SL	—	—	M	F	
108	C	2.5Y 6/3	30"	5YR 5/8	>5	SL	—	5	M	F	

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Site Address or Map/Lot Number ACTON

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

   Deep Hole Number TP-6 Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) 5

   Vegetation BRUSH _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — (feet) Drainage Way — (feet) Possible Wet Area >100 (feet)

   Property Line 100' (feet) Drinking Water Well — (feet) Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: 34 (Inches) _____ (elevation)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number ACTON
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole A: Deep Hole Number: TP-6

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6	A	10YR 3/2	—	—	—	SL	—	5	M	F	
22	B	10YR 5/6	—	—	—	SL	—	—	M	F	
84	C	2.5Y 6/3	34	5YR 5/8	>5	SL	—	5	M	F	
84	R										

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 MASHOBA ROAD
Site Address or Map/Lot Number: ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs
   Deep Hole Number TP-7 Ground Elevation at Surface of Hole _____
   Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) _____
   Vegetation BRUSH Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area >100 feet
   Property Line 80' feet Drinking Water Well — feet Other —

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒
   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☒ No ☐
   If Yes: Depth Weeping from Pit 88 Depth Standing Water in Hole 108
   Estimated Depth to High Groundwater: 36 (Inches) _____ (elevation)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 MASHOBA ROAD
Site Address or Map/Lot Number
ACTON

Deep Observation Hole A: Deep Hole Number: TP-7

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
7	A	10YR 3/2	—	—	—	SL	—	5	M	F	
24	B	10YR 5/6	—	—	—	SL	—	—	M	F	
116	C	2.5Y 6/3	36	5YR 5/8	>5	SL	—	5	M	F	

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Site Address or Map/Lot Number ACTON

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs
   Deep Hole Number TP-8 Ground Elevation at Surface of Hole _____
   Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ 5d Slope (%)
   BRUSH Vegetation _____ Landform _____ Position on landscape (attach sheet)

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area >100 feet
   Property Line 130 feet Drinking Water Well — feet Other —

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒
   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒
   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —
   Estimated Depth to High Groundwater: 34 Inches _____ elevation

ELECTRIC FENCE

10

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Site Address or Map/Lot Number ACTON

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 NASHOBA ROAD

Deep Observation Hole A: Deep Hole Number: TP-8

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
9	A	10yr 3/2	–	–	–	SL	–	5	M	F	
24	B	10yr 5/6	–	–	–	SL	–	–	M	F	
114	C	2.5y 6/3	34	5yr 5/8	>5	SL	–	5	M	F	

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 MASHOBA ROAD
Site Address or Map/Lot Number ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review (minimum of two holes required at every proposed disposal area)

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP9 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) 5+

Vegetation GRASS Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — (feet) Drainage Way — (feet) Possible Wet Area >100 (feet)

Property Line — (feet) Drinking Water Well — (feet) Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

Estimated Depth to High Groundwater: 40 (inches) _____ (elevation)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 MASHOBA ROAD
Site Address or Map/Lot Number ACTON

Deep Observation Hole A: Deep Hole Number: TP9

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
9	A	10YR 3/2	–	–	–	SL	–	S	M	F	
15	B	10YR 5/6	–	–	–	SL	–	–	M	F	
106	C	2.5Y 6/3	40	5YR 5/8	>5	SL	–	S	M	F	
106	R										

Additional Notes PIPE

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-10 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ (Surface Stones) 5+ (Slope (%))

GRASS (Vegetation) _____ (Landform) _____ (Position on landscape (attach sheet))

3. Distances from: Open Water Body — (feet) Drainage Way — (feet) Possible Wet Area >100 (feet)

Property Line _____ (feet) Drinking Water Well — (feet) Other —

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit — Depth Standing Water In Hole —

Estimated Depth to High Groundwater: 40 (Inches) _____ (elevation)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number 48 & 50 NASHOBA ROAD ACTON

Deep Observation Hole A: Deep Hole Number: TP-10

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
7	A	10YR 3/2	—	—	—	SL	—	5	M	F	
24	B	10YR 5/6	—	—	—	SL	—	—	M	F	
96	C	2.5Y 6/3	40			SL	—	5	M	F	
96	BOULDERS										

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-11 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ (Surface Stones) 5+ (Slope (%))

GRASS (Vegetation) _____ (Landform) _____ (Position on landscape (attach sheet))

3. Distances from: Open Water Body – (feet) Drainage Way – (feet) Possible Wet Area >100 (feet)

Property Line _____ (feet) Drinking Water Well – (feet) Other –

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit – Depth Standing Water in Hole –

Estimated Depth to High Groundwater: 40 (Inches) _____ (elevation)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number ACTON

Deep Observation Hole A: Deep Hole Number: TP-11

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (motties)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6	A	10YR 3/2	–	–	–	SL	–	5	M	F	
17	B	10YR 5/6	–	–	–	SL	–	–	M	F	
100	C	2.5Y 6/3	40	5YR 5/8	>5	SL	–	5	M	F	
100	R										

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-12 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) 5+

Vegetation GRASS Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area >100 feet

Property Line — feet Drinking Water Well — feet Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

Estimated Depth to High Groundwater: 40 inches _____ elevation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 MASHOBA ROAD
Site Address or Map/Lot Number ACTON

Deep Observation Hole A: Deep Hole Number: TP-12

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6	A	10YR 3/2	—	—	—	SL	—	5	M	F	
22	B	10YR 5/6	—	—	—	SL	—	—	M	F	
102	C	2.5Y 6/3	40			SL	—	5	M	F	
102	BOULDERS.										

Additional Notes _____

Commonwealth of Massachusetts
City/Town of
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Site Information

Kotaw Chik
Owner Name

48 & 50 NASHOBA ROAD
Street Address or Lot #

ACTON — MA
City/Town — State — Zip Code

Contact Person (if different from Owner) — Telephone Number

B. Test Results

	7-18-06	10 AM	7-18	
	Date	Time	Date	Time
Observation Hole #	PT-1		PT-4	
Depth of Perc	48"		47"	
Start Pre-Soak	10:08		10:11	
End Pre-Soak	10:23		10:26	
Time at 12"	10:23		10:26	
Time at 9"	10:36		10:38	
Time at 6"	10:56		10:58	
Time (9"-6")	20		20	
Rate (Min./Inch)	7		7	
	Test Passed: ■ Test Failed: ☐		Test Passed: ■ Test Failed: ☐	

STAMSKI AND McNARY, INC - MATTHEW ALLSON
Test Performed By:

BRENT REAGOR - ACTON BOH
Witnessed By:

Comments:

Commonwealth of Massachusetts
City/Town of
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Site Information

Owner Name: KOTANCHIK

Street Address or Lot #: 48 & 50 NASHOBA RD

City/Town: ACTON | State: MA | Zip Code:

Contact Person (if different from Owner): | Telephone Number:

B. Test Results

	Date: 7-18-06	Time	Date: 7-18	Time
Observation Hole #	PT-7		PT-6	
Depth of Perc	45"		57"	
Start Pre-Soak	10:48		11:11	
End Pre-Soak	11:03		11:26	
Time at 12"	11:03		11:26	
Time at 9"	11:30		11:43	
Time at 6"	11:59		12:09	
Time (9"-6")	29		26	
Rate (Min./Inch)	10		9	
	Test Passed: ■ Test Failed: ☐		Test Passed: ■ Test Failed: ☐	

Test Performed By: STAMSKI AND McNARY, INC. - MATTHEW ALLISON

Witnessed By: BRENT REAGOR - ACTON BOH

Comments:

Commonwealth of Massachusetts
City/Town of
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Site Information

KOTANCHIK
Owner Name

48350 NASHOBA RD
Street Address or Lot #

ACTON — MA
City/Town — State — Zip Code

Contact Person (if different from Owner) — Telephone Number

B. Test Results

	Date 7-18	Time	Date	Time
Observation Hole #	PT-9		PT-10	
Depth of Perc	46"		50"	
Start Pre-Soak	11:50		12:29	
End Pre-Soak	12:05		12:44	
Time at 12"	12:14		12:44	
Time at 9"	12:32		12:57	
Time at 6"	12:59		1:18	
Time (9"-6")	27 min.		21 min.	
Rate (Min./Inch)	9 MPI		7 MPI	

Test Passed: ☒ Test Failed: ☐ — Test Passed: ☒ Test Failed: ☐

Stamski and McNary, Inc - Matthew Allison
Test Performed By:

B Reagan Acton BOH
Witnessed By:

Comments:

Commonwealth of Massachusetts
City/Town of
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Site Information

KOTANCHIK
Owner Name

483 SO NASHOBA RD
Street Address or Lot #

ACTON — City/Town
MA — State
Zip Code

Contact Person (if different from Owner)
Telephone Number

B. Test Results

	7-18		7-19	9 AM
	Date	Time	Date	Time
Observation Hole #	PT-17	PORTER	PT-21	KOTANCHIK
Depth of Perc	46"		46"	
Start Pre-Soak	2:10		9:29	
End Pre-Soak	2:25		9:44	
Time at 12"	2:25		9:44	
Time at 9"	3:12		9:51	
Time at 6"	3:57		10:03	
Time (9"-6")	45		12	
Rate (Min./Inch)	15		4	
	Test Passed: ☑ Test Failed: ☐		Test Passed: ☑ Test Failed: ☐	

STAMSKI AND McNARY, INC. - MATTHEW ALLISON
Test Performed By:

BRENT REAGOR - ACTON BOH
Witnessed By:

Comments:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

48½ 50 NASHOBA RD
Site Address or Map/Lot Number

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review

(minimum of two holes required at every proposed disposal area)

Deep Observation Hole A: 7-19-06 (Date) 8:36 AM (Time) SUNNY (Weather)

1. Deep Observation Hole Logs

   Deep Hole Number 21 Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) 0-3 Surface Stones 0-3 Slope (%)

   GRASS Vegetation _____ Landform _____ Position on landscape (attach sheet)

3. Distances from: Open Water Body _____ feet Drainage Way _____ feet Possible Wet Area _____ feet

   Property Line _____ feet Drinking Water Well _____ feet Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ■

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ■

   If Yes: Depth Weeping from Pit _____ Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: _____ inches _____ elevation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

Site Address or Map/Lot Number

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole A: Deep Hole Number: 21

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-6	A	10YR 3/2	-	-	-	SL	-	20	M	F	
6-22	B	10YR 5/6	-	-	-	SL	-	10	M	F	
22-114	C	2.5Y 6/3	48		<5	SL	-	10	M	F	
	R										

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48½50 NASHOBA RD
Site Address or Map/Lot Number

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 7-19-06 (Date) 8:30 (Time) SUNNY (Weather)

1. Deep Observation Hole Logs

Deep Hole Number 22 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: field (e.g. woodland, agricultural field, vacant lot, etc.) 0-3 (Surface Stones) 0-3 (Slope (%))

Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body _____ feet Drainage Way _____ feet Possible Wet Area _____ feet
Property Line _____ feet Drinking Water Well _____ feet Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ■

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ■

If Yes: Depth Weeping from Pit _____ Depth Standing Water in Hole _____

Estimated Depth to High Groundwater: _____ inches _____ elevation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number _____

Deep Observation Hole A: Deep Hole Number: 22

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8	A	10YR3/2	-	—	—	SL	-	20	M	F	
8-22	B	10YR5/6	—	—	-	SL	-	10	M	F	
22-36	C	2.5Y6/3	48		5	SL	—	10	M	F	
	R										

Additional Notes _____

Commonwealth of Massachusetts
City/Town of

48 NASHOBA & 6 WAMPATUCK DRIVE

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method used:
   - ☐ Depth observed standing water in observation hole A. _____ inches B. _____ inches
   - ☐ Depth weeping from side of observation hole A. _____ inches B. _____ inches
   - ■ Depth to soil redoximorphic features (motties) A. _____ inches B. _____ inches SEE INDIVIDUAL LOGS
   - ☐ Groundwater adjustment (USGS methodology) A. _____ inches B. _____ inches TP 1-19

2. Index Well Number _____ Reading Date _____ Index Well Level _____

   Adjustment Factor _____ Adjusted Groundwater Level _____

E. Depth of Pervious Material

12-1-05 TP 1-16
7-18-06 TP 17-19

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes ■ No ☐ TEST PITS 1 => 19

   b. If yes, at what depth was it observed? Upper boundary: _____ inches Lower boundary: _____ inches

F. Certification

STAMSKI AND McNARY, INC.

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator — Date 7/19/2006

RICHARD J. HARRINGTON — *Date of Soil Evaluator Exam 10-25-1994

Typed or Printed Name of Soil Evaluator

BRENT REAGOR — ACTON

Name of Board of Health Witness — Board of Health

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Massachusetts Department of Environmental Protection 48 [illegible] 6 [illegible] (SO WASH[illegible])
Bureau of Resource Protection – Wastewater Permitting Program
Site Address or Map/Lot Number

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method used:
   - ☐ Depth observed standing water in observation hole A. _____ inches B. _____ inches
   - ☐ Depth weeping from side of observation hole A. _____ inches B. _____ inches
   - ■ Depth to soil redoximorphic features (mottles) A. _____ inches B. _____ inches
   - ☐ Groundwater adjustment (USGS methodology) A. _____ inches B. _____ inches

   SEE INDIVIDUAL LOGS TP 20-22

2. Index Well Number _____ Reading Date _____ Index Well Level _____

   Adjustment Factor _____ Adjusted Groundwater Level _____

E. Depth of Pervious Material

7-18-06 PT 1,4,6,7,9,10,13,14 & 17
7-19-06 TP 20-22
PT 19 & 21

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes ■ No ☐ SEE INDIVIDUAL LOGS

   b. If yes, at what depth was it observed? Upper boundary: _____ inches Lower boundary: _____ inches

F. Certification STAMSKI AND McNARY, INC.

I certify that I have passed the soil evaluator examination* approved by the Department of Environmental Protection and that the abov analysis was performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017.

Matthew Allison
Signature of Soil Evaluator

7/19/06
Date

MATTHEW ALLISON
Typed or Printed Name of Soil Evaluator

9/04
*Date of Soil Evaluator Exam

BRENT REAGOR
Name of Board of Health Witness

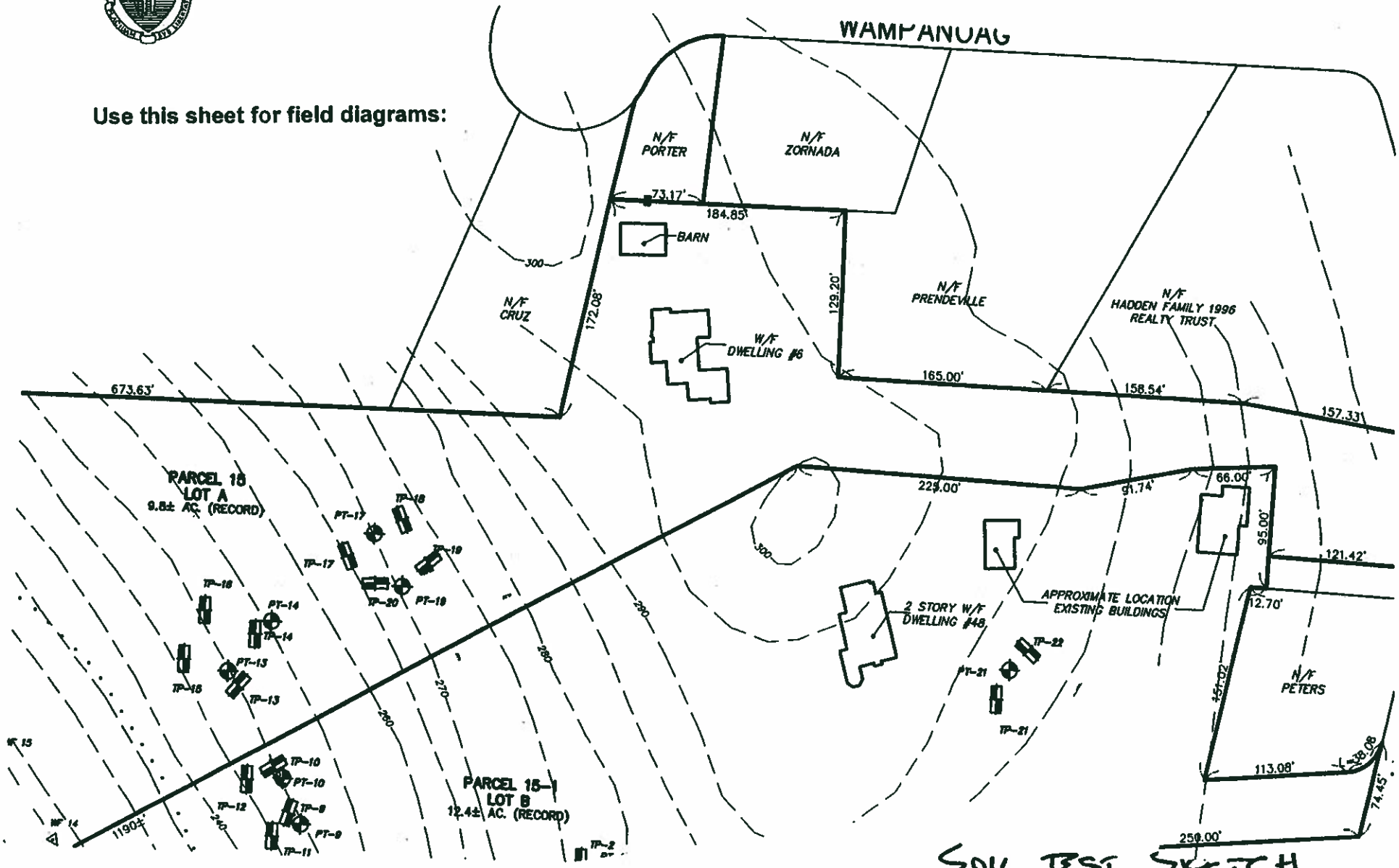
ACTON
Board of Health

Note: This form must be submitted to the approving authority with Percolation Test Form 12

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Use this sheet for field diagrams:



SOIL TEST SKETCH
7-20-2006 1"=100'

3777ST SKETCH.DWG

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

DEP has provided this form for use by on-site professionals and local Boards of Health. Other forms may be used, but the information must be substantially the same as provided here. Before using this form, check with your local Board of Health to determine the form they use.

A. Facility Information

STAMSKI AND McNARY INC
TEST PITS
13-16 12-1-2005
17-20 7-18-2006
PERC TESTS 13, 14, 17 & 19

1. Facility Information

Owner Name: RICHARD PORTER

Street Address: 6 WAMPANOAG DRIVE (SO WASHBA) Map/Lot: D-2 / 15

City/Town: ACTON State: MA Zip Code:

B. Site Information

1. (Check one) New Construction ☒ Upgrade ☐ Repair ☐

2. Published Soil Survey available? Yes ☒ No ☐ If yes: Year Published ____ Publication Scale ____ Soil Map Unit ____

   Soil Name ____ Soil limitations ____

3. Surficial Geological Report available? Yes ☐ No ☒ If yes: Year Published ____ Publication Scale ____ Map Unit ____

   Geologic Material ____ Landform ____

4. Flood Rate Insurance Map:

   Above the 500 year flood boundary? Yes ☒ No ☐ Within the 100 year flood boundary? Yes ☐ No ☒

   Within the 500 year flood boundary? Yes ☐ No ☒ Within a Velocity Zone? Yes ☐ No ☒

5. Wetland Area: National Wetland Inventory Map — Map Unit: WETLANDS Name: FLAGGED ON SITE

   Wetlands Conservancy Program Map — Map Unit: ____ Name: ____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-13 Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) _____

Vegetation GRASS _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body _____ feet Drainage Way _____ feet Possible Wet Area _____ feet

Property Line _____ feet Drinking Water Well _____ feet Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☐

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

Estimated Depth to High Groundwater: 40 inches _____ elevation

PIPE
14 ☐ 13 ☐
16 ☐ 15 ☐

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number ACTON

Deep Observation Hole A: Deep Hole Number: TP-13

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
7	A	10YR 3/2	—	—	—	SL		5	M	F	
36	B	10YR 5/6	—	—	—	SL		—	M	F	
100	C	2.5Y 6/3	40	5YR 5/8	>5	SL		5	M	F	

Additional Notes PIPE

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number 48 & 50 MASHOBA ROAD ACTON

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

Deep Hole Number TP-14 Ground Elevation at Surface of Hole _____

Location (identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) _____

Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area >100 feet

Property Line — feet Drinking Water Well — feet Other —

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

Estimated Depth to High Groundwater: 40 inches _____ elevation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Site Address or Map/Lot Number 48 & 50 MASHOBA ROAD ACTON

Deep Observation Hole A: Deep Hole Number: TP 14

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
7	A	10YR 3/2	—	—	—	SL	—	S	M	F	
30	B	10YR 5/6	—	—	—	SL	—	—	M	F	
100	C	2.5Y 6/3	40	5YR 5/8	>5	SL	—	S	M	F	
	BOULDERS										

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

48 & 50 MASHOBA ROAD
Site Address or Map/Lot Number ACTON

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole A: 12/1/2005 (Date) _____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

   Deep Hole Number TP-15 Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) _____ Surface Stones _____ Slope (%) >5

   Vegetation GRASS _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body – (feet) Drainage Way – (feet) Possible Wet Area >100 (feet)

   Property Line _____ (feet) Drinking Water Well – (feet) Other –

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit – Depth Standing Water in Hole –

   Estimated Depth to High Groundwater: 40 (inches) _____ (elevation)

14 13
☒ ☐
16 15
○ ○

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

48 & 50 MASHOBA ROAD
Site Address or Map/Lot Number ACTON

Deep Observation Hole A: Deep Hole Number: TP-15

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
11	A	10YR 3/2	–	–	–	SL	–	5	M	F	
28	B	10YR 5/6	–	–	–	SL	–	–	M	F	
92	C	2.5Y 6/3	40	5YR 5/8	>5	SL	–	5	M	F	
	BOULDERS										

Additional Notes _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number ACTON

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

STAMSKI AND McNARY, INC.

C. On-Site Review

(minimum of two holes required at every proposed disposal area)

Deep Observation Hole A: 12/1/2005 (Date) ____ (Time) CLEAR 40° (Weather)

1. Deep Observation Hole Logs

   Deep Hole Number TP-16 Ground Elevation at Surface of Hole ____

   Location (Identify on Plan) ____

2. Land Use: FIELD (e.g. woodland, agricultural field, vacant lot, etc.) ____ Surface Stones ____ Slope (%) ____

   Vegetation GRASS ____ Landform ____ Position on landscape (attach sheet) ____

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area >100 feet

   Property Line ____ feet Drinking Water Well — feet Other —

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☒

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☒

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: 40 inches ____ elevation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

48 & 50 NASHOBA ROAD
Site Address or Map/Lot Number ACTON

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole A: Deep Hole Number: TP-16

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR 3/2	—	—	—	SL	—	5	M	F	
26	B	10YR 5/6	—	—	—	SL	—	—	M	F	
96	C	2.5Y 6/3	40	5YR 5/8	>5	SL	—	5	M	F	
	BOULDERS										

Additional Notes ____

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

6. Current Water Resource Conditions (USGS) _____ (Month/Year) Range: Above Normal ☐ Normal ☐ Below Normal ☐

7. Other references reviewed: _____

STAMSKI AND McNARY, INC.

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole Number: 17 Date: 7/18/06 Time: _____ Weather: Sun 95°

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones _____ Slope (%) 5-10

   Vegetation PINE Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area — feet

   Property Line _____ feet Drinking Water Well — feet Other — _____

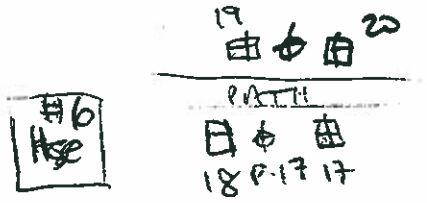
4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ■

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ■

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: 48



Deep Observation Hole Number: TP-17

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 3/2	—	—	—	SL	—	10	M	F	
22	B	10YR 5/6	—	—	—	SL	—	10	M	F	
112	C	2.5Y 6/3	48	5YR 5/8	>5	SL	—	10	M	F	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

6. Current Water Resource Conditions (USGS) _____ (Month/Year) Range: Above Normal ☐ Normal ☐ Below Normal ☐

7. Other references reviewed: _____

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole Number: ____ 7/18/06 (Date) _____ (Time) Sun 95° (Weather)

1. Location

   Ground Elevation at Surface of Hole _____

   Location (Identify on Plan) _____

2. Land Use: WOODLAND (e.g. woodland, agricultural field, vacant lot, etc.) _____ (Surface Stones) 5-10 (Slope (%))

   _____ (Vegetation) _____ (Landform) _____ (Position on landscape [attach sheet])

3. Distances from: Open Water Body _____ feet Drainage Way — feet Possible Wet Area >100 feet

   Property Line _____ feet Drinking Water Well Town feet Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ■

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: 46 _____

Deep Observation Hole Number: TP-18

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 3/2	—	—	—	SL	—	10	M	F	
22	B	10YR 5/6	—	—	—	SL	—	10	M	F	
116	C	2.5Y 6/3	46	5YR 5/8	XS	SL	—	10	M	F	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

6. Current Water Resource Conditions (USGS) _____ (Month/Year) Range: Above Normal ☐ Normal ☐ Below Normal ☐

7. Other references reviewed: _____

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole Number: 19 7/18/06 (Date) _____ (Time) _____ (Weather)

1. Location

   Ground Elevation at Surface of Hole _____

   Location (identify on Plan) _____

2. Land Use: WOODLAND (e.g. woodland, agricultural field, vacant lot, etc.) _____ (Surface Stones) 5-10 (Slope (%))

   _____ (Vegetation) _____ (Landform) _____ (Position on landscape (attach sheet))

3. Distances from: Open Water Body — feet Drainage Way — feet Possible Wet Area — feet

   Property Line _____ feet Drinking Water Well _____ feet Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ■

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ■

   If Yes: Depth Weeping from Pit — Depth Standing Water in Hole —

   Estimated Depth to High Groundwater: 46 _____

Deep Observation Hole Number: TP-19

Depth (In.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR 3/2	—	—	—	SL	—	10	M	F	
24	B	10YR 5/6	—	—	—	SL	—	10	M	F	
118	C	2.5Y 6/3	46	5YR 5/8	75	SL	—	10	M	F	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

6. Current Water Resource Conditions (USGS) _____ (Month/Year) Range: Above Normal ☐ Normal ☐ Below Normal ☐

7. Other references reviewed: _____

C. On-Site Review *(minimum of two holes required at every proposed disposal area)*

Deep Observation Hole Number: 20 Date: 7/19/06 Time: _____ Weather: Sun 95°

1. Location

Ground Elevation at Surface of Hole _____

Location (Identify on Plan) _____

2. Land Use: WOODLAND (e.g. woodland, agricultural field, vacant lot, etc.) Surface Stones _____ Slope (%) _____

Vegetation _____ Landform _____ Position on landscape (attach sheet) _____

3. Distances from: Open Water Body _____ feet Drainage Way – feet Possible Wet Area 700 feet

Property Line _____ feet Drinking Water Well TOWN feet Other _____

4. Parent Material: GLACIAL TILL Unsuitable Materials Present: Yes ☐ No ■

If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ■

If Yes: Depth Weeping from Pit – Depth Standing Water in Hole –

Estimated Depth to High Groundwater: 48" _____

Deep Observation Hole Number: TP-20

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-8"	A	10YR 3/2	–	–	–	SL	–	10	M	F	
8-22"	B	10YR 5/6	–	–	–	SL	–	10	M	F	
22-110"	C	2.5Y 6/3	48	5YR 5/8	<5	SL	–	10	M	F	

Additional Notes _____

Commonwealth of Massachusetts
City/Town of
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Site Information

Owner Name: KOTANCHIK

Street Address or Lot #: 483 & 50 NASHOBA RD

City/Town: ACTON | State: MA | Zip Code:

Contact Person (if different from Owner): | Telephone Number:

B. Test Results

	Date: 7-18-06 Time:	Date: 7-18-06 Time:
Observation Hole #	PT-13	PT-14
Depth of Perc	45"	46"
Start Pre-Soak	12:35	1:15
End Pre-Soak	12:50	1:30
Time at 12"	12:50	1:30
Time at 9"	1:07	1:44
Time at 6"	1:24	2:01
Time (9"-6")	17 MIN	17 MIN.
Rate (Min./Inch)	6 MPI	6 MPI
	Test Passed: ■ Test Failed: ☐	Test Passed: ■ Test Failed: ☐

Test Performed By: STAMSKI & McNARY INC. - MATHEW ALLISON

Witnessed By: BRENT REAGOR - ACTON BOH

Comments:

Commonwealth of Massachusetts
City/Town of
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Site Information

Owner Name: KOTANCHIK

Street Address or Lot #: 48350 NASHOBA RD

City/Town: ACTON | State: MA | Zip Code:

Contact Person (if different from Owner): | Telephone Number:

B. Test Results

	Date: 7-19-06	Time	Date	Time
Observation Hole #	PT-19			
Depth of Perc	45"			
Start Pre-Soak	10:10			
End Pre-Soak	10:25			
Time at 12"	10:26			
Time at 9"	10:48			
Time at 6"	11:23			
Time (9"-6")	35			
Rate (Min./Inch)	12			
	Test Passed: ☒ Test Failed: ☐		Test Passed: ☐ Test Failed: ☐	

Test Performed By: STAMSKI AND McNARY, INC. - MATTHEW ALLSON

Witnessed By: BRENT REAGOR - ACTON BOH

Comments:

Commonwealth of Massachusetts
City/Town of
Percolation Test
Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Site Information

Owner Name: KOTANCHIK

Street Address or Lot #: 483 SO NASHOBA RD

City/Town: ACTON | State: MA | Zip Code:

Contact Person (if different from Owner): | Telephone Number:

B. Test Results

	7-18		7-19	9 AM
	Date	Time	Date	Time
Observation Hole #	PT-17		PT-21	
Depth of Perc	46"		46"	
Start Pre-Soak	2:10		9:29	
End Pre-Soak	2:25		9:44	
Time at 12"	2:25		9:44	
Time at 9"	3:12		9:51	
Time at 6"	3:57		10:03	
Time (9"-6")	45		12	
Rate (Min./Inch)	15		4	
	Test Passed: ☑ Test Failed: ☐		Test Passed: ☑ Test Failed: ☐	

Test Performed By: Stamski AND McNARY, INC. - MATTHEW ALLISON

Witnessed By: BRENT REAGOR - ACTON BOH

Comments:

Commonwealth of Massachusetts 48 MASHOBA & 6 WAMPATUCK DRIVE
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method used:
   - ☐ Depth observed standing water in observation hole A. _____ inches B. _____ inches
   - ☐ Depth weeping from side of observation hole A. _____ inches B. _____ inches
   - ■ Depth to soil redoximorphic features (mottles) A. _____ inches B. _____ inches SEE INDIVIDUAL LOGS
   - ☐ Groundwater adjustment (USGS methodology) A. _____ inches B. _____ inches TP 1-19

2. Index Well Number _____ Reading Date _____ Index Well Level _____

   Adjustment Factor _____ Adjusted Groundwater Level _____

E. Depth of Pervious Material

12-1-05 TP 1-16
7-18-06 TP 17-19

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes ■ No ☐ TEST PITS 1 ⇒ 19

   b. If yes, at what depth was it observed? Upper boundary: _____ inches Lower boundary: _____ inches

F. Certification

STANSKI AND McNANY, INC.

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator — Date 7/19/2006

RICHARD J. HARRINGTON — *Date of Soil Evaluator Exam 10-25-1994

Typed or Printed Name of Soil Evaluator

BRENT REAGOR — ACTON

Name of Board of Health Witness — Board of Health

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

48 NASHOBA 6 WAMPANOAG (SO. NASHOBA)
Site Address or Map/Lot Number

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method used:
   - ☐ Depth observed standing water in observation hole A. _____ inches B. _____ inches
   - ☐ Depth weeping from side of observation hole A. _____ inches B. _____ inches
   - ■ Depth to soil redoximorphic features (mottles) A. _____ inches B. _____ inches
   - ☐ Groundwater adjustment (USGS methodology) A. _____ inches B. _____ inches

   SEE INDIVIDUAL LOGS TP 20-22

2. Index Well Number _____ Reading Date _____ Index Well Level _____

   Adjustment Factor _____ Adjusted Groundwater Level _____

E. Depth of Pervious Material

7-18-06 PT 1,4,6,7,9,10,13,14 & 17
7-19-06 TP 20-22
PT 19 & 21

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes ■ No ☐ SEE INDIVIDUAL LOGS

   b. If yes, at what depth was it observed? Upper boundary: _____ inches Lower boundary: _____ inches

F. Certification STAMSKI AND McNARY, INC.

I certify that I have passed the soil evaluator examination* approved by the Department of Environmental Protection and that the abov analysis was performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017.

Matthew Allison — Signature of Soil Evaluator
7/19/06 — Date

MATTHEW ALLISON — Typed or Printed Name of Soil Evaluator
9/04 — *Date of Soil Evaluator Exam

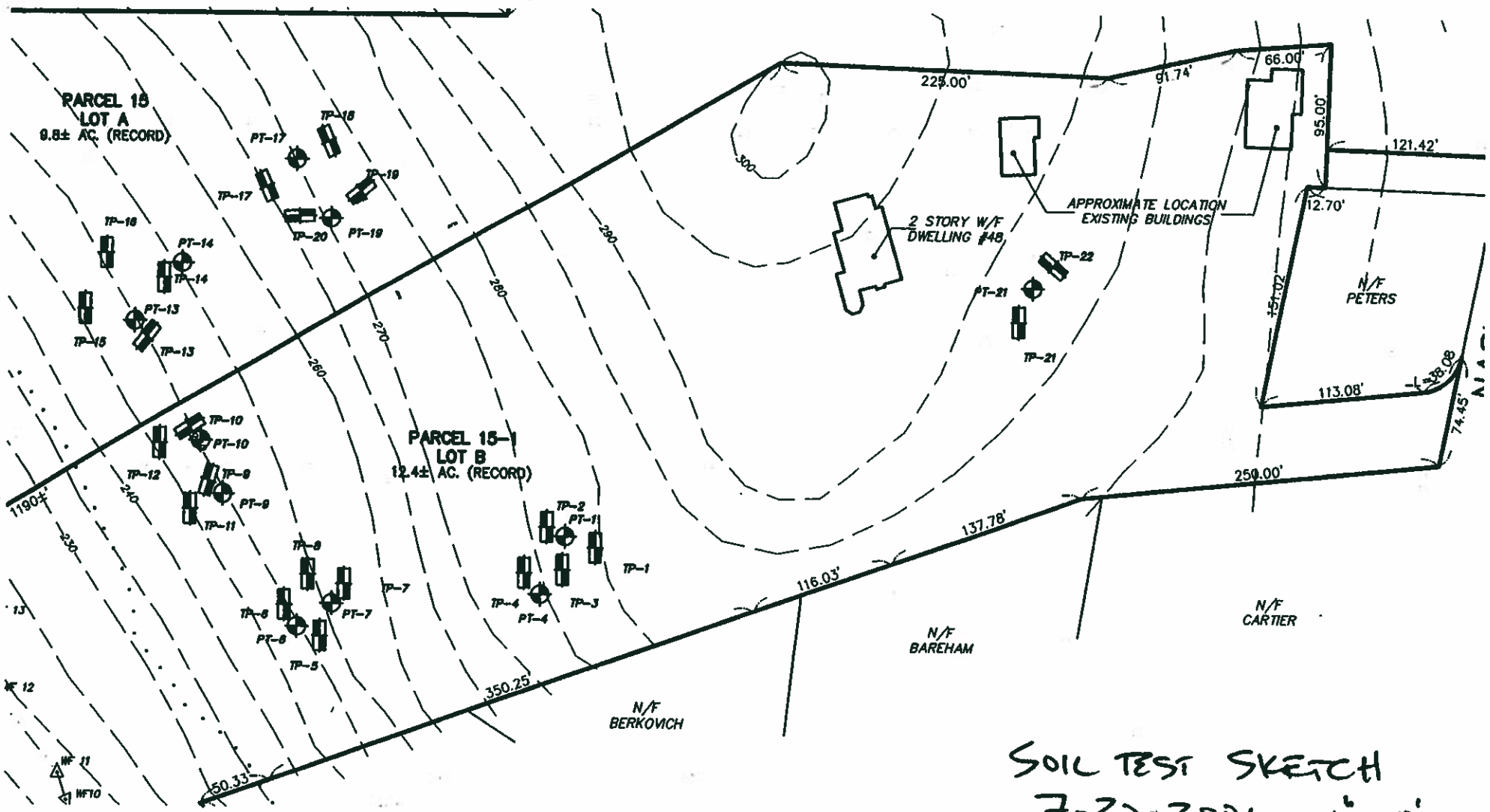
BRENT REAGOR — Name of Board of Health Witness
ACTON — Board of Health

Note: This form must be submitted to the approving authority with Percolation Test Form 12

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Use this sheet for field diagrams:



SOIL TEST SKETCH
7-20-2006 1"=100'

3777ST SKETCH.DWG

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

Site Address or Map/Lot Number

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review

(minimum of two holes required at every proposed disposal area)

Deep Observation Hole A: 1/7/08 (Date) 130 (Time) 50° (Weather)

1. Deep Observation Hole Logs

   Deep Hole Number 1-08 Ground Elevation at Surface of Hole _____

   Location (identify on Plan) _____

2. Land Use: WOODLAND (e.g. woodland, agricultural field, vacant lot, etc.) YES (Surface Stones) 5-10% (Slope (%))

   Pine (Vegetation) _____ (Landform) _____ (Position on landscape (attach sheet))

3. Distances from: Open Water Body _____ feet Drainage Way _____ feet Possible Wet Area _____ feet

   Property Line _____ feet Drinking Water Well _____ feet Other _____

4. Parent Material: Glacial Till Unsuitable Materials Present: Yes ☐ No ☐

   If Yes: Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock ☐

5. Groundwater Observed: Yes ☐ No ☑

   If Yes: Depth Weeping from Pit _____ Depth Standing Water in Hole _____

   Estimated Depth to High Groundwater: _____ inches _____ elevation

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wastewater Permitting Program

Site Address or Map/Lot Number

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole A: Deep Hole Number: 1-08

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6"	A	10YR 3/2				SL			M	F	
40"	B	10YR 5/6				SL			M	F	

Additional Notes: NO REDOX PRESENT
HAND DUG FOR