

SOIL/SITE EVALUATION for ON-SITE WASTEWATER SYSTEM

Owner:

Applicant:

Address:

Date Evaluated: 2/9/04

Proposed Facility: 4 BDRM HOME Design Flow (.1949): 480 gpd

Property Size:

Location of Site:

Property Recorded:

Water Supply: ☒ Public ☐ Individual ☐ Well ☐ Spring ☐ Other
Evaluation Method: ☒ Auger Boring ☐ Pit ☐ Cut
Type of Wastewater: ☒ Sewage ☐ Industrial Process ☐ Mixed

Profile #	1940 Landscape Position/Slope%	Horizon Depth (IN.)	SOIL MORPHOLOGY		OTHER PROFILE FACTORS				Profile Class & LTAR
			1941 Structure/Texture	1941 Consistence Mineralogy	1942 Soil Wetness/Color	1943 Soil Depth (IN.)	1956 Sapro Class	1944 Restr Horiz	
1	TS 2.7%	0-20	G LS	VFR NS/NP					PS .55
		20-43	CR/SBK SCL	VFR S/NP	STANDING H ₂ O @ 26"				US
2		0-30"	G S	VFR NS/NP	CR2 @ 0"				US/PS .8
									US
3		0-36"	G S	VFR NS/NP	STR 8/1 CR2 @ 34"	STANDING H ₂ O @ 15"			US
									US
4		0-30"	G S	VFR NS/NP	10YR 5/2 @ 18"				US
									US
5		6-0"	FILL						US
		0-40"	G LS/S	VFR NS/NP	10YR 6/2 @ 16"				PS .55
6		0-6"	G S	VFR NS/NP					US
		6-40"	SBK SCL	VFR S/NP	STANDING H ₂ O @ 36"				US
7		0-5'	G S	VFR NS/NP					US
		5'-10"	G S	VFR NS/NP	7.5YR 7/2 @ 7"				US

Description	Initial System	Repair System
Available Space (.1945)		
System Type(s)		
Site LTAR		

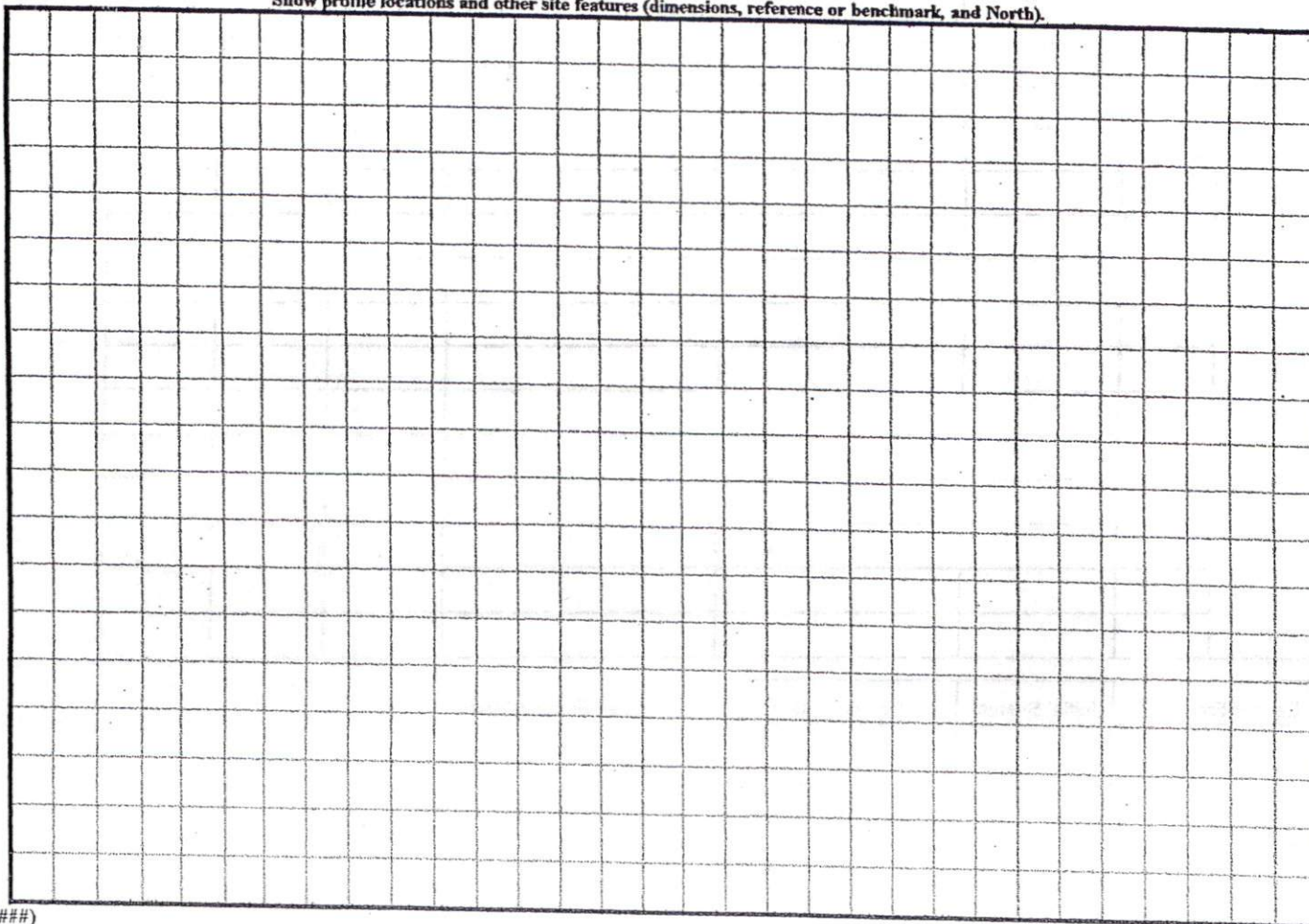
Other Factors (.1946):
Site Classification (.1948): US
Evaluated By: OT
Others Present:

COMMENTS: _____

LANDSCAPE POSITIONS	GROUP	TEXTURES	.1955 LTAR	CONSISTENCE MOIST	WET
R-RIDGE	I	S-SAND	1.2 - 0.8	VFR-VERY FRIABLE	NS-NON-STICKY
S-SHOULDER SLOPE		LS-LOAMY SAND			
L-LINEAR SLOPE	II	SL-SANDY LOAM	0.8 - 0.6	FI-FIRM	SS-SLIGHTLY STICKY
FS-FOOT SLOPE		L-LOAM			
N-NOSE SLOPE	III	SI-SILT-	0.6 - 0.3	VFI-VERY FIRM	S-STICKY
H-HEAD SLOPE		SIL-SILT LOAM			
CC-CONCLAVE SLOPE	IV	CL-CLAY LOAM	0.4 - 0.1	EFI-EXTREMELY FIRM	VS-VERY STICKY
CV-CONVEX SLOPE		SCL-SANDY CLAY LOAM			
T-TERRACE		SICL-SILTY CLAY LOAM			NP-NON-PLASTIC
FP-FLOOD PLAN		SIC-SILTY CLAY			SP-SLIGHTLY STICKY
		C-CLAY			P-PLASTIC
		SC-SANDY CLAY			VP-VERY PLASTIC

<u>STRUCTURE</u>	<u>MINERALOGY</u>
SG-SINGLE GRAIN	SLIGHTLY EXPANSIVE
M-MASSIVE	
CR-CRUMB	EXPANSIVE
GR-GRANULAR	
SBK-SUBANGULAR BLOCKY	
ABK-ANGULAR BLOCKY	
PL-PLATY	
PR-PRISMATIC	

Show profile locations and other site features (dimensions, reference or benchmark, and North).



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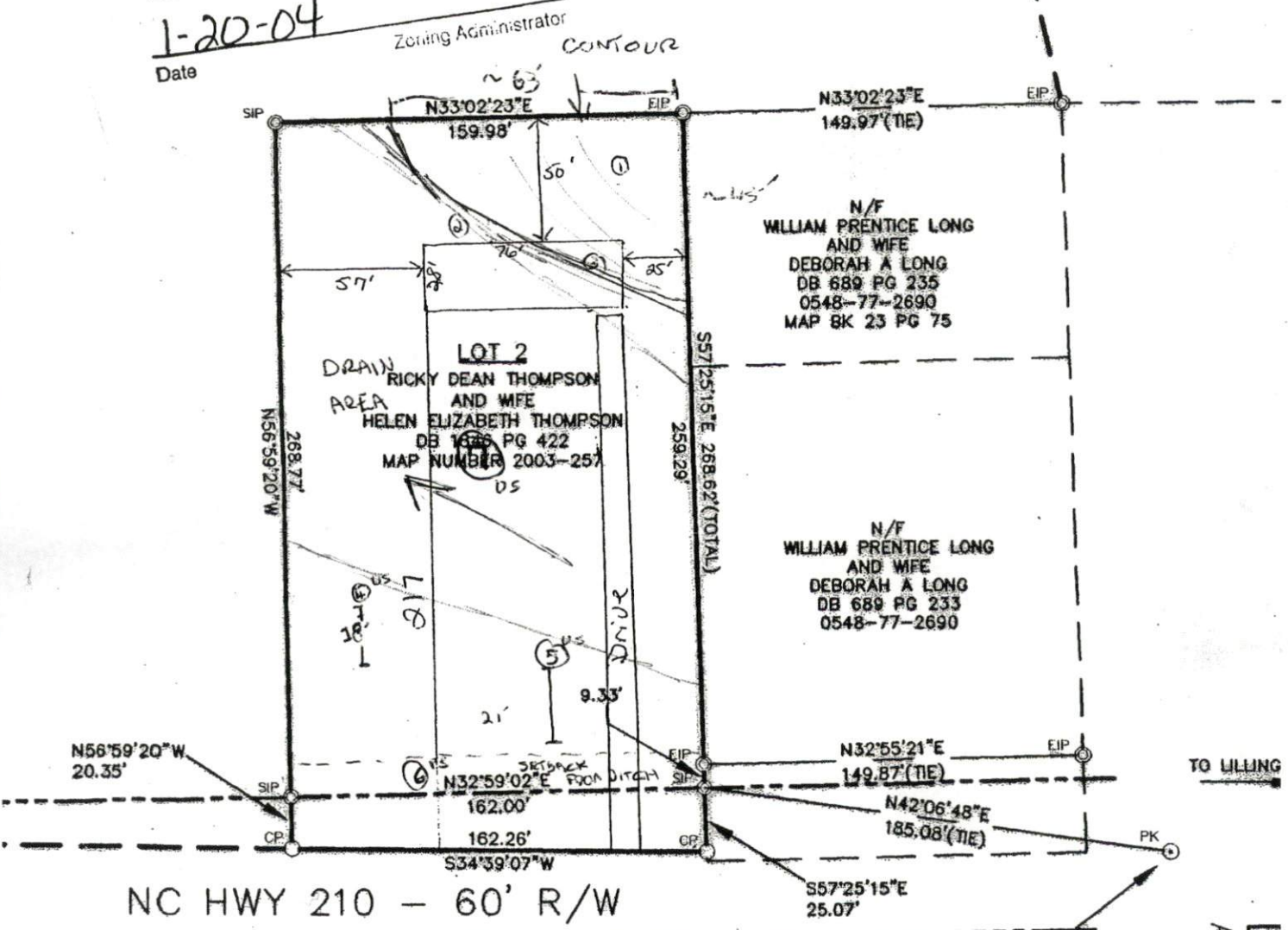
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Property Size:
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☐ Spring ☐ Other
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3		0-36"	G S	VFR NS/NP	7.5 YR 8/1 CR @ 34"	STANDING H ₂ O @ 15"			US/PS .8
4		0-30"	G S	VFR NS/NP	10 YR 5/2 @ 28"				US
5		6-0"	FILL						
		0-40"	G LS/S	VFR NS/NP	10 YR 6/2 @ 16"				US
6		0-6"	G S	VFR NS/NP					PS .55
		6-40"	SBK SCL	VFR S/NP	STANDING H ₂ O @ 36"				
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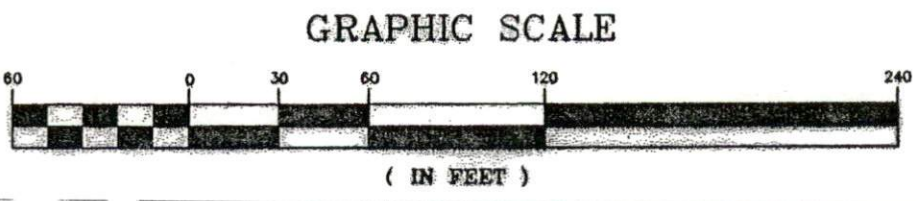
Description	Initial System	Repair System
Available Space (.1945)		
System Type(s)		
Site LTAR		

Other Factors (.1946):
Site Classification (.1948): US
Evaluated By: OT
Others Present:

SITE PLAN APPROVAL
 DISTRICT BA20R USE DWMAH
 #BEDROOMS 4
1-20-04
 Date _____
 Zoning Administrator _____



2004-43
 2004
 [Signature]



AMERICAN LEGION
 60' R/W
 (SOIL SURFACE)

facility. Adjusted daily rates based upon use of water-conserving es shall apply only to design capacity requirements of dosing and distribution systems and nitrification fields. Minimum pretreatment capacities shall be determined by the design flow rate of Table I of this Rule.

*History Note: Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. January 1, 1990; January 1, 1984.*

.1950 LOCATION OF SANITARY SEWAGE SYSTEMS

(a) Every sanitary sewage treatment and disposal system shall be located at least the minimum horizontal distance from the following:

- (1) Any private water supply source, including any well or spring 100 feet;
- (2) Any public water supply source 100 feet;
- (3) Streams classified as WS-I 100 feet;
- (4) Waters classified as S.A. 100 feet, from mean high water mark;
- (5) Other coastal waters 50 feet, from mean high water mark;
- (6) Any other stream, canal, marsh, or other surface waters 50 feet;
- (7) Any Class I or Class II reservoir 100 feet, from normal pool elevation;
- (8) Any permanent storm water retention pond 50 feet, from flood pool elevation;
- (9) Any other lake or pond 50 feet, from normal pool elevation;
- (10) Any building foundation 5 feet;
- (11) Any basement 15 feet;
- (12) Any property line 10 feet;
- (13) Top of slope of embankments or cuts of 2 feet or more vertical height 15 feet;
- (14) Any water line 10 feet;
- (15) Drainage Systems:
 - (A) Interceptor drains, foundation drains, and storm water diversions
 - (i) upslope 10 feet,
 - (ii) sideslope 15 feet, and
 - (iii) downslope 25 feet;
 - (B) Groundwater lowering ditches and devices 25 feet;
- (16) Any swimming pool 15 feet;
- (17) Any other nitrification field (except repair area) 20 feet;

(b) Ground absorption sewage treatment and disposal systems may be located closer than 100 feet from a private water supply, except springs and uncased wells located downslope and used as a source of drinking water, for repairs, space limitations, and other site-planning considerations but shall be located the maximum feasible distance and in no case less than 50 feet.

(c) Nitrification fields and repair areas shall not be located under paved areas or areas subject to vehicular traffic. If effluent is to be conveyed under areas subject to vehicular traffic, ductile iron or its equivalent pipe shall be used. However, pipe specified in Rule .1955 (e) may be used if a minimum of 30 inches of compacted cover is provided over the pipe.

(d) In addition to the requirements of Paragraph (a) of this Rule, sites to be used for subsurface disposal for design units with flows over 3,000 gallons per day, as determined in Rule .1949 (a) or (b) of this Section, which include one or more nitrification fields with individual capacities of greater than 1,500 gallons per day, shall be located at least the minimum horizontal distance from the following:

- (1) Any Class I or II reservoir or any public water supply source utilizing a shallow (under 50 feet) groundwater aquifer 500 feet;
- (2) Any other public water supply source, unless determined to utilize a confined aquifer 200 feet;
- (3) Any private water supply source, unless determined to utilize a confined aquifer 100 feet;
- (4) Waters classified as SA 200 feet, from mean high water mark;
- (5) Any waters classified as WS-I 200 feet;
- (6) Any surface waters classified as WS-II, WS-III, B, or SB 100 feet; and
- (7) Any property line 25 feet.

(e) Collection sewers, force mains, and supply lines shall be located at least the minimum horizontal distance from the following:

- (1) Any public water supply source, including wells, springs,

be located to the left of outlet blockout. All tanks shall also be permanently marked with the date of manufacture adjacent to the tank imprint or on the top of the tank directly above the imprint.

(c) Plans for prefabricated tanks, risers and riser covers, other than those approved under Paragraphs (a) or (b) of this Rule, shall be approved on an individual basis as determined by the information furnished by the designer which indicates the tank, riser or riser cover will provide equivalent effectiveness as those designed in accordance with the provisions of Paragraphs (a) and (b) of this Rule.

(d) Tanks other than approved prefabricated tanks shall be constructed consistent with the provisions of this Rule except as follows:

- (1) Cast-in-place concrete septic and pump tanks shall have a minimum wall thickness of six inches.
- (2) Concrete block or brick masonry tanks shall have a minimum wall thickness of at least six inches when the design volume is less than 1,000 gallons and a minimum wall thickness of at least eight inches when the design volume is 1,000 gallons or more. All joints between masonry units shall be mortared using masonry cement mortar or equivalent. The joints shall have a nominal thickness of three-eighths inch. All concrete block masonry tanks shall have a minimum wall reinforcement of number three reinforcing bars on 20-inch centers, or equivalent. The maximum allowable reinforcement spacing in either direction shall be four feet. All block wall cores shall be filled with concrete with a minimum compressive strength of 3,000 pounds per square inch. All tanks constructed of block or brick shall be plastered on the inside with a 1:3 mix (one part cement, three parts sand) of Portland cement at least three-eighths inch thick or the equivalent using other approved waterproofing material.
- (3) The bottom of the built-in-place tank shall be poured concrete with a minimum thickness of four inches. All built-in-place tanks shall be reinforced to satisfy the structural strength requirements of Paragraph (a)(9) of this Rule. Reinforcement shall be placed in both directions throughout the entire tank, including top, bottom, walls, and ends.

(e) Manufacturers of septic tanks, effluent filters, pump tanks, risers, and riser locators shall comply with the General Statutes, this Section, and Approval conditions. If the approved products or materials are found to be in non-compliance, the Operation Permit shall not be issued or shall be denied. The State shall suspend or revoke the product approval upon a finding that the information submitted is falsified, the product has been subsequently altered, or subsequent experience with the product results in altered conclusions about its design or performance. Suspension or revocation of the product approval shall not affect systems previously installed pursuant to the approval.

*History Note: Authority G.S. 130A-335(e), (f), and (f1) [2nd];
Eff. July 1, 1982;
Amended Eff. August 1, 1991; January 1, 1990;
Temporary Amendment Eff. January 1, 1999.*

.1955 DESIGN AND INSTALLATION CRITERIA FOR CONVENTIONAL SEWAGE SYSTEMS

(a) Conventional septic tank systems shall utilize a septic tank of approved construction with an approved effluent filter and support case, access devices, and design volume which provides primary treatment of the sewage in accordance with the provisions of these Rules. The effluent filter support case shall be solvent welded to a PVC Schedule 40 outlet pipe with a minimum diameter of three inches inserted through the outlet connective sleeve creating a watertight and mechanically sound joint and shall extend at least 24 inches beyond the tank outlet. The filter and support case shall be installed and maintained in accordance with the filter manufacturer's specifications. The effluent filter shall be accessible without the operator entering the septic tank and removable by hand. The effluent filter shall be secured in the support case and located under the outlet access opening or manhole. When the top of the septic tank or access manhole is installed below finished grade, the location of each access opening or manhole shall be visibly marked at finished grade. The visible marker(s) shall be located over or within a five foot radius of each access opening or manhole. The marker(s) shall be identified as a septic tank locator. When not placed over each access opening or manhole, the marker(s) shall indicate location of tank access opening(s) or manhole(s). The filtered effluent from the septic tank shall be conveyed to an approved nitrification line where the soil provides for final treatment and disposal of the sewage.

(b) Table II shall be used in determining the maximum long-term acceptance rate for septic tank systems of conventional trench design. The long-term acceptance rate shall be based on the most hydraulically limiting naturally occurring soil horizon within three feet of the ground surface or to a depth of one foot below trench bottom, whichever is deeper.

- difference
- (iii) Maximum elevation difference between the highest and lowest laterals in a field shall not exceed ten feet unless the flow is hydraulically split between subfield segments without requiring simultaneous adjustment of multiple valves.
 - (E) Turn-ups shall be provided at the ends of each lateral, constructed of Schedule 40 PVC pipe or equivalent, and protected with sleeves of larger diameter pipe (six inches or greater). Turn-ups and sleeves shall be cut off and capped at or above the ground surface, designed to be protected from damage, and easily accessible.
 - (F) The supply manifold shall be sized large enough relative to the size and number of laterals served so that friction losses and differential entry losses along the manifold do not result in more than a 15 percent variation in discharge rate between the first and last laterals.
 - (i) The ratio of the supply manifold inside cross sectional area to the sum of the inside cross sectional areas of the laterals served shall exceed 0.7:1.
 - (ii) The reduction between the manifold and connecting laterals shall be made directly off the manifold using reducing tees.
 - (iii) Cleanouts to the ground surface shall be installed at the ends of the supply manifold.
 - (G) Gate valves shall be provided for pressure adjustment at the fields whenever the supply line exceeds 100 feet in length. Valves shall be readily accessible from the ground surface and adequately protected in valve boxes.
- (6) Septic tanks, pump tanks, pump dosing systems, siphons, and siphon dosing tanks shall be provided in accordance with Rule .1952 of this Section.
- (A) Design flow rate shall be based upon delivering two feet to five feet of static pressure head at the distal end of all lateral lines.
 - (B) Dose volume shall be between five and ten times the liquid capacity of the lateral pipe dosed, plus the liquid capacity of the portions of manifold and supply lines which drain between doses.
- (b) **FILL SYSTEM:** A fill system (including new and existing fill) is a system in which all or part of the nitrification trench(es) is installed in fill material. A fill system, including an existing fill site, may be approved where soil and site conditions prohibit the installation of a conventional or modified septic tank system if the requirements of this Paragraph are met.
- (1) Fill systems may be installed on sites where at least the first 18 inches below the naturally occurring soil surface consists of soil that is suitable or provisionally suitable with respect to soil structure and clay mineralogy, and where organic soils, restrictive horizons, saprolite or rock are not encountered. Further, no soil wetness condition shall exist within the first 12 inches below the naturally occurring soil surface and a groundwater lowering system shall not be used to meet this requirement. Fill systems shall not be utilized on designated wetlands unless the proposed use is specifically approved in writing by the designating agency. The following requirements shall also be met:
 - (A) Nitrification trenches shall be installed with at least 24 inches separating the trench bottom and any soil horizon unsuitable as to soil structure, clay mineralogy, organic soil, rock or saprolite. However, if a low pressure pipe system is used, the minimum separation distance shall be 18 inches.
 - (B) Nitrification trenches shall be installed with at least 18 inches separating the trench bottom and any soil wetness condition. This separation requirement for soil wetness conditions may be met with the use of a groundwater lowering system only in Soil Groups I and II, with suitable structure and clay mineralogy. However, if a low pressure pipe system is used, the minimum separation distance shall be 12 inches.
 - (C) Systems shall be installed only on sites with uniform slopes less than 15 percent. Storm water diversions and subsurface interceptor drains or swales may be required upslope of the system.
 - (D) The long-term acceptance rate shall be based on the most hydraulically limiting soil horizon within 18 inches of the naturally occurring soil surface or to a depth one foot below the trench bottom, whichever is deeper. The lowest long-term acceptance rate for the applicable soil group shall be used for systems installed pursuant to this Rule. However, the long-term acceptance rate shall not exceed 1.0 gallons per day per square foot for gravity distribution or 0.5 gallons per day per square foot for low-pressure pipe systems installed on sites with at least 18 inches of Group I soils below the naturally occurring soil surface or to a depth of one foot below the trench bottom, whichever is deeper.
 - (E) If the fill system uses low-pressure pipe distribution, all the requirements of Paragraph (a) of this Rule, except Paragraph (a)(2)(B), shall apply. Systems with a design daily flow greater than 480

- gallons per day : use low-pressure pipe distribution.
- (F) Fill material shall have such soil texture to be classified as sand or loamy sand (Soil Group I) up to the top of the nitrification trenches. The final six inches of fill used to cover the system shall have a finer texture (such as Group II, III) for the establishment of a vegetative cover. Existing fill material shall have no more than ten percent by volume of fibrous organics, building rubble, or other debris and shall not have discreet layers containing greater than 35 percent of shell fragments.
 - (G) Where fill material is added, the fill material and the existing soil shall be mixed to a depth of six inches below the interface. Heavy vegetative cover or organic litter shall be removed before the additional fill material is incorporated.
 - (H) The fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope.
 - (I) The side slope of the fill shall not exceed a rise to run ratio of 1:4. However, if the first 18 inches below the naturally occurring soil surface is Group I soil, the side slope of the fill shall not exceed a rise to run ratio of 1:3.
 - (J) The outside edge of the nitrification trench shall be located at least five feet horizontally from the top of the side slope.
 - (K) The fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover against erosion.
 - (L) The setback requirements shall be measured from the projected toe of the slope. However, if this setback cannot be met, the setback requirements shall be measured from a point five feet from the nearest edge of the nitrification trench if the following conditions are met:
 - (i) Slope of the site shall not exceed two percent;
 - (ii) The first 18 inches of soil beneath the naturally occurring soil surface shall consist of Group I soils;
 - (iii) The lot or tract of land was recorded on or before December 31, 1989; and
 - (iv) A condition is placed upon the Improvement Permit to require connection to a public or community sewage system within 90 days after such system is available for connection and after it is determined that 300 feet or less of sewer line is required for connection.
 - (M) The available space requirements of Rule .1945 of this Section shall apply.
- (2) An existing fill site that does not meet the requirements of Paragraph (b)(1) of this Rule may be utilized for a sanitary sewage system if the following requirements are met:
- (A) Substantiating data are provided by the lot owner (if not readily available to the local health department) indicating that the fill material was placed on the site prior to July 1, 1977.
 - (B) The fill material placed on the site prior to July 1, 1977 shall have such soil texture to be classified as sand or loamy sand (Group I) for a depth of at least 24 inches below the existing ground surface. This fill material shall have no more than ten percent by volume of fibrous organics, building rubble, or other debris. This fill shall not have discreet layers containing greater than 35 percent of shell fragments. However, if at least 24 inches of Group I fill material was in place prior to July 1, 1977, additional fill with soil texture classified as Group I may be added to meet the separation requirements of Paragraph (b)(2)(D) of this Rule.
 - (C) Soil wetness conditions, as determined by Rule .1942(a) in this Section, are 18 inches or greater below the ground surface of the fill placed on the lot prior to July 1, 1977. This requirement shall be met without the use of a groundwater lowering system.
 - (D) Low-pressure pipe distribution shall be used and shall meet all the requirements of Paragraph (a) of this Rule, except (a)(2)(B). The long-term acceptance rate shall not exceed 0.5 gallons per day per square foot. However, for existing fill sites with 48 inches of Group I soils, conventional nitrification trenches utilizing a maximum long-term acceptance rate of 1.0 gallons per day per square foot may be installed in lieu of low-pressure pipe systems. The minimum separation distance between the trench bottom and any soil wetness condition or any soil horizon unsuitable as to soil structure, clay mineralogy, organic soil, rock, or saprolite shall be 24 inches for low pressure pipe systems and 48 inches for conventional systems. This separation requirement may be met by adding additional Group I soil, but shall not be met with the use of a groundwater lowering system. Where fill is to be added, the requirements of Paragraphs (b)(1)(C), (F), (G), (H), (J), (K), of this Rule and the following requirements shall be met:
 - (i) The side slope of the fill shall not exceed a side slope ratio of 1:3, and;
 - (ii) The setback requirements shall be measured from the projected toe of the slope. However,