SOIL AND SLOPE CONSIDERATIONS
OF THE
TOWN OF CAROGA

Fulton County Planning Department
September 14, 1977

The preparation of this report was financially aided through a grant from the State of New York, Department of State, Division of Community Affairs, pursuant to Article 48 of Chapter 464 of the Laws of the State of New York of 1974 and Chapter 348 of the Laws of the State of New York of 1973.

CONTENTS

SUMMARY..... 1
PLANNING GUIDELINES..... 1
PURPOSE..... 3

CHAPTER 1 - SLOPE CONSIDERATIONS 4
CHAPTER 2 - SOIL ASSOCIATIONS..... 7
CHAPTER 3 - SOIL SUITABILITY FOR SEPTIC SYSTEMS.....13

MAPS-------- I. Slope Rating..... 6
II. Soil Associations..... 8
III. Depth of Soil Over Bedrock.....16
IV. Levels of Groundwater.....17
V. Slope Limitations.....19
VI. Stone/Boulder Limitations.....22
VII. Composite Rating.....23

CREDITS

TOWN SUPERVISOR

Emma Krause

CAROGA TOWN PLANNING BOARD

Robert Kane, Chairman
Marie Johnson, Secretary
Richard Lorence
Gordon Croucher
George Curtin
Jesse George Lake
Emmeran Arnst, Town Board Representative

FULTON COUNTY PLANNING DEPARTMENT STAFF

Author - Paul O'Connor, Town Planner
Supervision - Harold P. Kaulfuss, Director
Graphics - Gary Ovitt, Planning Aide
Stenography - Sally Johnston, Prov. Sr. Stenographer

SUMMARY — SLOPES

-Caroga's highest elevation is 2,620 feet above sea level.
-Caroga's lowest elevation is 1,140 feet above sea level.
-The United States Geological Survey (U.S.G.S.) maps were the data source for slope information.
-Slopes were divided into four groups: 0-3%, 3-8%, 8-15% and 15+%.
-The 0-3% slopes were identified as flat and as having minor development limitations.
-The 3-8% slopes were identified as gently rolling and, of all slope groups, generally best suited for development.
-The 8-15% slopes were identified as moderately sloping and as having moderate development limitations.
-Slopes greater than 15% were rated as having severe development constraints.

SUMMARY—SOILS

-Development in Caroga has primarily been for residential purposes, with the disposal of sewage wastes through the use of conventional septic systems.
-The capacity of soils for percolating wastewater effluents is a critical factor defining the development potential within Caroga.
-Soil Associations data, prepared by the Soil Conservation Service, identifies potential soil-related problems in each area of the Town.
-An Airphoto Assessment of Land Suitability for Septic Tanks was prepared by Cornell University's Remote Sensing Program.
-The airphoto assessment identifies the degrees of limitation imposed by depth to soil over bedrock, levels of groundwater, slope and stoniness/ boulder limitations.
-Severe septic system constraints exist in the following areas: where bedrock is at the surface or less than five feet deep; where groundwater is at or near the surface year-round; where slope gradients are greater than 15 percent and areas where excessive stones and/or boulders interfere with the construction, or operation, of septic systems.

PLANNING GUIDELINES

-Development activities, on slopes greater than 15 percent, should be closely monitored to avoid problems such as erosion, siltation, insufficient filtering of sewage effluents and access difficulties.

-The soil limitations rating, prepared by Cornell University's Remote Sensing Program, should be utilized as one of the general guidelines in the preparation of Caroga's Land Use Plan.

-The Caroga Environmental Management Council should be requested to seek funds for a detailed soil survey, to be completed only in selected areas of the Town. This revised soil data should be utilized to update this report, the forthcoming land use plan and the land use control measures.

PURPOSE

This report is intended as both an inventory of available data on soil and slope conditions, as well as an analysis of how these conditions generally define the suitability of each area of Caroga for residential development.

Although soil and slope conditions are important physical factors affecting residential development, other factors should not be ignored. Wetlands, areas adjacent to first order streams and flood hazard areas* are additional physical factors to consider. Other planning issues, such as visual qualities, economic prospects, population forecasts and existing land use patterns will supplement these soil and slope considerations in the eventual preparation of Caroga's Land Use Plan.

Most of the 1,780 dwelling units in the Town of Caroga utilize septic tanks for sewage disposal purposes. Public sewer systems are not available and a small number of dwellings utilize seepage pits and outhouses.

Most dwellings in Caroga are located in close proximity to lakes. Many of these dwellings were constructed on small lots, lacking sufficient land area for proper drain fields and proper distances from wells for domestic water supplies.

The pollution scare of 1968, resulting in closed beaches, was the culmination of an environmental imbalance. The capacity of the lakes to absorb pollution has been exceeded. Planning efforts in the Town should continue to be directed toward protecting water quality in the numerous lakes of the Town. According to the Planning Board's Opinion Survey, widespread public support exists for protecting water quality and for restricting development where soil and drainage conditions are limited.**

This report assembles the soil related data available, with particular emphasis on the limitations imposed on septic system installation and operation. The slope rating and composite of limitations for septic systems are two vitally important reference tools in Caroga's planning process.

---

* Water Resources of the Town of Caroga; Fulton County Planning Department; March 10, 1976; p.p. 8-12.

**1975 Survey Report, Town of Caroga; Fulton County Planning Department; August 13, 1975; p. C-15.

CHAPTER I

SLOPE CHARACTERISTICS

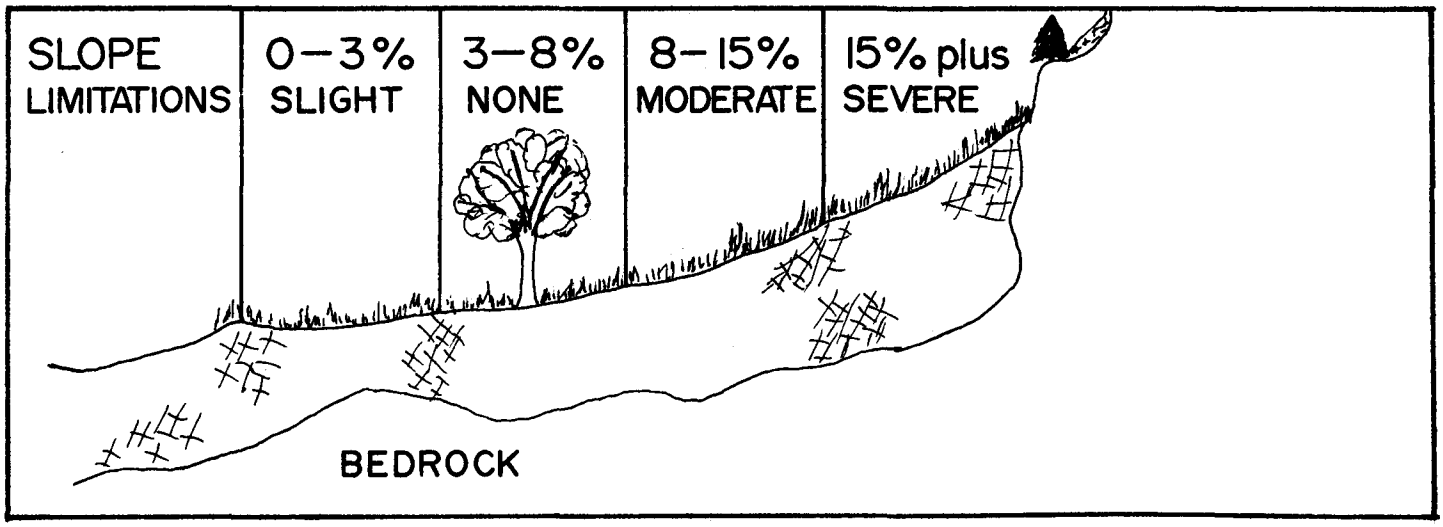
The Town of Caroga is located in the southern portion of the Adirondack Mountains. The general area is characterized by a wide variety of landscapes, including rugged mountains, low-lying wetland areas and gently rolling hills. The highest elevation in Caroga is 2,620 feet above sea level and is situated on the border of the Towns of Bleecker and Caroga. The lowest point of elevation, at 1,140 feet above sea level, is located along Cape Horn Road on the border of the Towns of Johnstown and Caroga.

Slope characteristics are important in determining the suitability of land for development. Slopes influence the type and cost of development, weather conditions, controls the rate and direction of runoff and adds variety to the landscape. Slope information can be obtained from several sources, the most common of which is provided by the United States Geological Survey. The U.S.G.S. maps, at a scale of 1" = 2,000', identifies the locations for each twenty foot contour line.

Average slopes for the Town of Caroga were calculated by dividing the distance (usually 500 feet) into the elevation change within that area. For example, if the elevation changes by 60 feet (3 contour lines at 20 feet each) over a 500 foot distance, the average slope is 12 percent (60 ÷ 500 =.12). It is important to note that this is only an "average" slope and that the topography can vary greatly within these areas.

Figure 1 identifies the slope groups, their development limitations and an illustration of the general topography within each group.

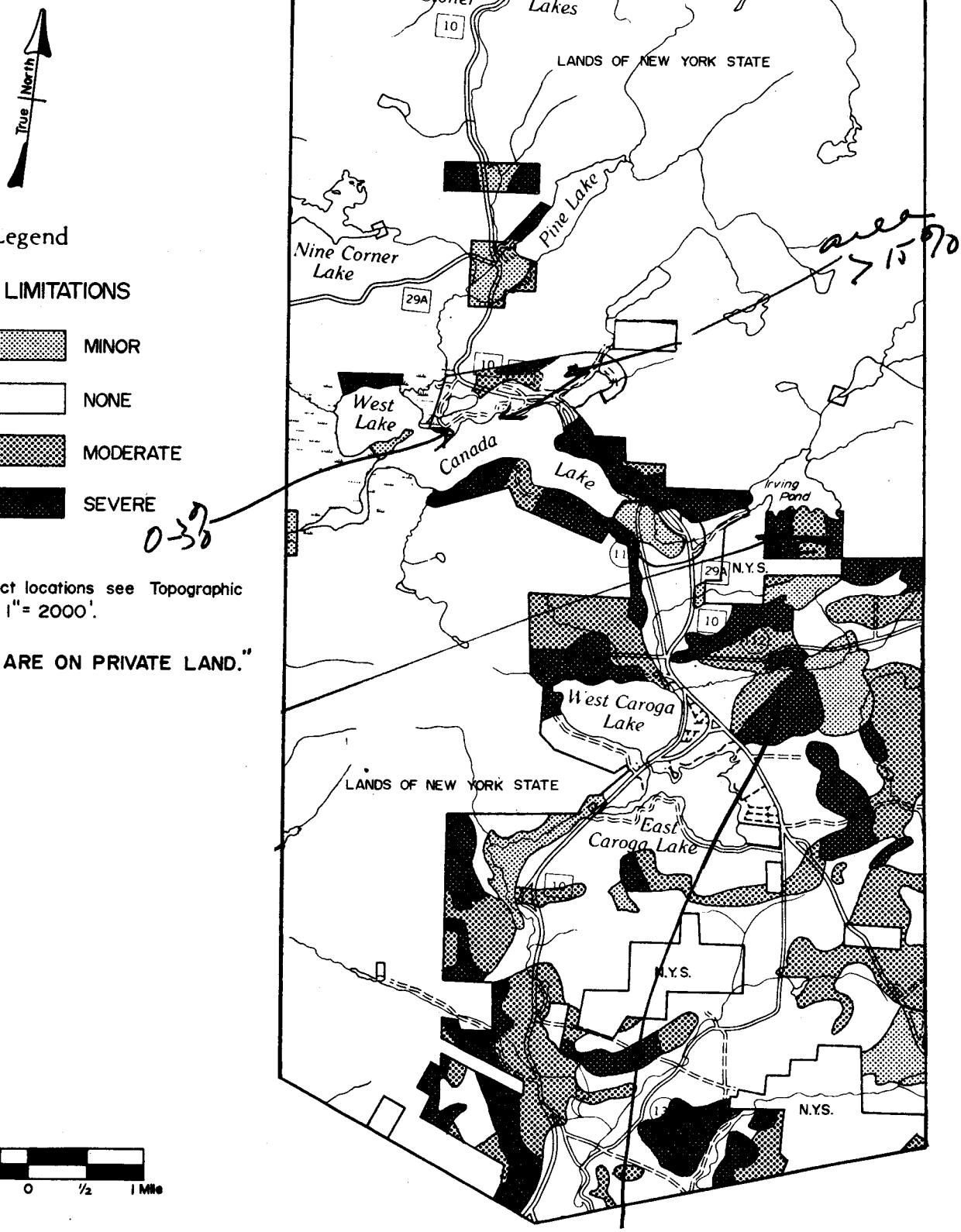
FIGURE I



TOWN OF

CAROGA, N.Y.

SLOPE RATING — MAP I



NOTE: For exact locations see Topographic Map at 1"= 2000'.

"ALL RATINGS ARE ON PRIVATE LAND."

PREPARED BY: THE FULTON COUNTY PLANNING DEPARTMENT, 1976.

Table 1 identifies descriptive terms for each slope group and a summary of problems encountered within each:

TABLE 1
Slope Summary

Group	Description	Common Problems
0- 3%	Flat	Drainage problems
3- 8%	Gently Rolling	None
8-15%	Moderately sloping	Erosion, access problems
15+%	Steep to very steep	Erosion, siltation, insufficient filtering of sewage effluent, access problems

The accompanying slope rating map identifies the general location of each average slope grouping and the general development rating applied to each.

A severe development limitation has been applied to all steep and very steep areas, due to the fact that extensive management and careful design will be required to overcome the following limitations:

a. Septic leaching fields do not function properly on slopes greater than 15 percent. The effluent cannot drain downward evenly into the soil, has the tendency to settle in one section of the leaching field and often surfaces at a lower level of slope.

b. Proper access to areas of steep slopes is both difficult and expensive. Localities normally refuse to accept roads with grades greater than 10 percent. Roads on steep slopes often cause sheet erosion, leading to washouts and gully formation in the spring. Winter access problems necessitate extra attention by the Town to keep roads passible.

c. Construction activities, for roads and buildings, tend to cause erosion problems on slopes greater than 15 percent. Erosion contributes to the formation of gullies and washouts on the landscape, as well as the possible siltation and clogging of streams and wetlands.

d. The amount of vegetation cutting required for all types of construction, greatly increases on slopes greater than 15 percent.

CHAPTER 2

SOIL ASSOCIATIONS

Although there are many definitions of soils, for the purposes of this planning study, soils refer to all loose, unconsolidated material above bedrock.

A knowledge of soil limitations and capabilities is essential to most development activities. Penetration of the land's surface is required for the development of wells, septic systems and basements. A high water table, whether permanently or seasonally high, is an example of an adverse soil condition, which indicates a need to take special precautions. (Refer to Figure 2)

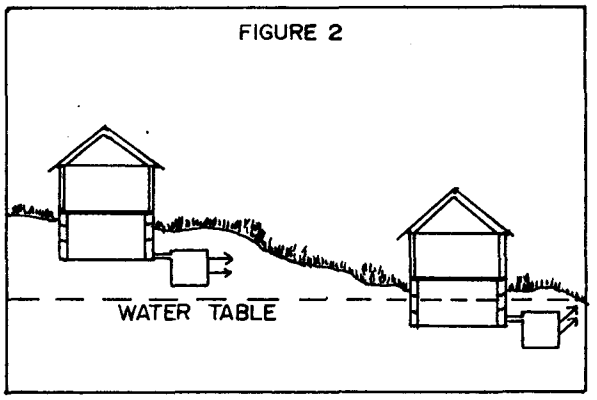


FIGURE 2

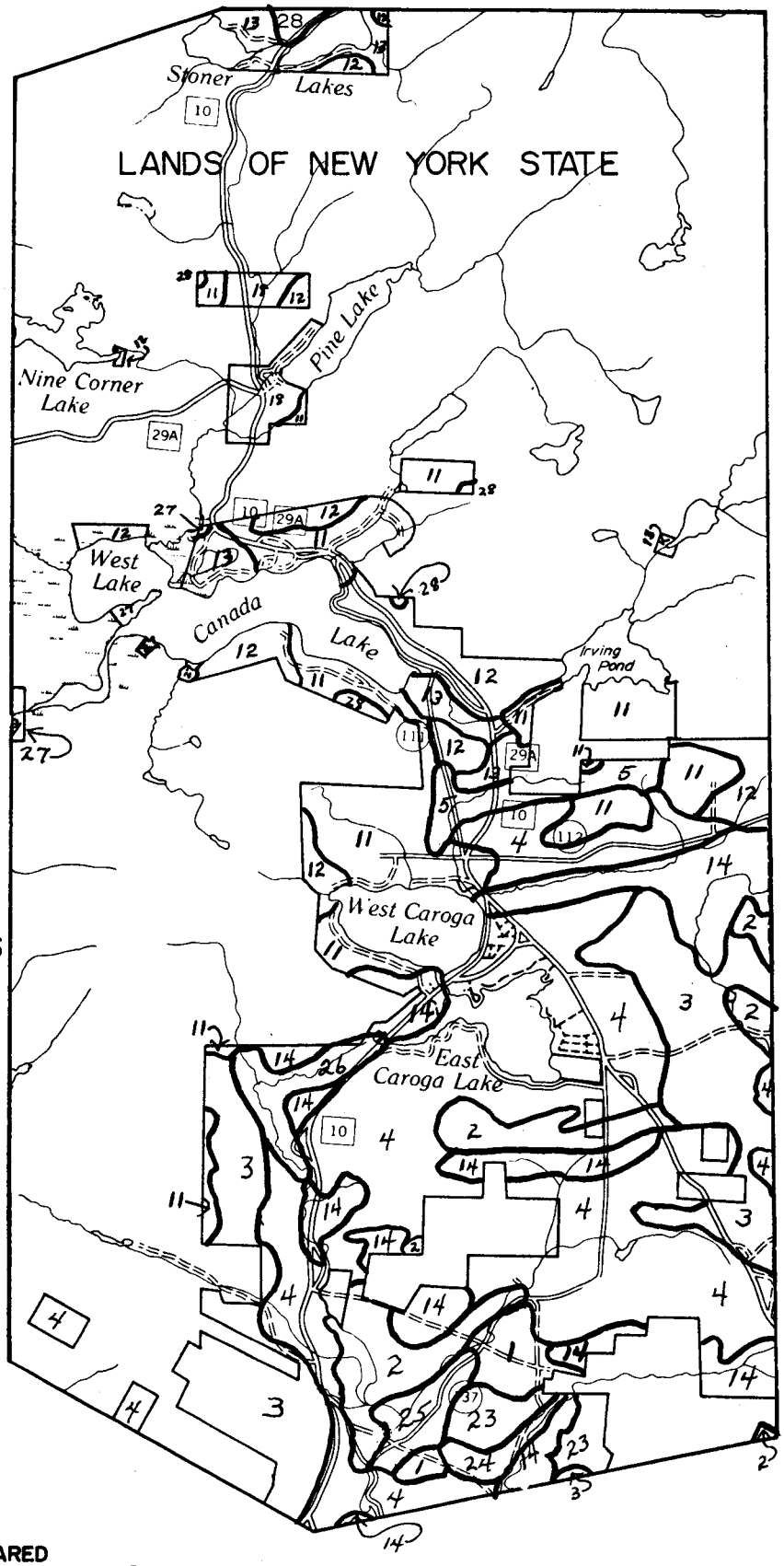
The accompanying soils map, prepared by the Soil Conservation Service in 1973, is technically referred to as a meso-intensity soils survey. This map is only intended to be accurate to an area of greater than 40 acres in size.

It should be further noted that the mapped associations do not reveal the precise location of each specific soil type within a given association. For example, in an area designated as containing the Charlton soil association, 65 percent of that area consists of Charlton soil, while the remaining area may be comprised of minor soils of various unidentified types. Other soil associations, like Charlton-Hollis, contain one predominant soil (Charlton), one secondary soil (Hollis) and one or more minor soils (unidentified types).

The 16 soil associations of Caroga have been categorized into seven distinct groups. The most common soil category has been identified as Deep Soils with Fragipan and includes the Brayton-Dannemora, Potsdam-Canaan, Potsdam-Crary and Ridgebury-Whitman Associations. These associations are characterized by a fragipan, or hardpan (cemented layer of soil), anywhere from one to ten feet below the surface. Hardpan, anywhere from one to five feet below the surface, causes slow permeability and places a severe limitation on septic tank leachfields. The hardpan also contributes to a high seasonal water table, generally found anywhere from the ground surface to three feet below the surface.

TOWN OF

CAROGA, N.Y.



Legend

SOIL ASSOCIATIONS

DEEP SOILS WITHOUT FRAGIPAN
1. CHARLTON
2. CHARLTON-HOLLIS (sloping)
3. CHARLTON-HOLLIS (mod. steep)
4. SUTTON-LEICESTER

DEEP SOILS WITH FRAGIPAN
5. BRAYTON-DANNEMORA
11. POTSDAM-CANAAN (sloping)
12. POTSDAM-CANAAN (mod. steep)
13. POTSDAM-CRARY
14. RIDGEBURY-WHITMAN

MODERATELY DEEP & SHALLOW SOIL
18. SCARBORO

SOILS IN GLACIO-FLUVIAL DEPOSITS
23. HINCKLEY (sloping)
24. HINCKLEY (mod. steep)

DEEP SOILS IN ALLUVIAL DEPOSITS
25. ALLUVIAL

SOILS IN ORGANIC DEPOSITS
26. CARLISLE-PALMS
27. GREENWOOD-CATHRO

NON SOIL AREAS
28. CANNAN (rock outcrop)

Scale

1 Mile ½ 0 ½ 1 Mile

DATA SOURCE:
GENERAL SOILS OF THE ADIRONDACK PARK, PREPARED BY THE SOIL CONSERVATION SERVICE, AT A SCALE OF 1 inch EQUALS 1 mile, 1973.

Another major grouping has been identified as Deep Soils without Fragipan and includes the Charlton, Charlton-Hollis and Sutton-Leicester associations. These associations were formed in the glacial till parent materials and, thus, are made up of unsorted clays, sands, pebbles, silts and boulders. Because of their good drainage and generally adequate depths to bedrock and watertable, these soils are not generally rated as severely as the soil associations with fragipans.

The Scarboro soil association, developed in Glacial Terraces and Outwash Plains, exhibits very poor drainage and a seasonal watertable near the surface. Leaching fields and seepage pits should not be expected to function properly in this soil association.

The Hinckley soil association, developed in Glacio-Fluvial Deposits, are rated as having slight development limitations. This association is characterized by excessive drainage, rapid percolation rates, as well as adequate depths to bedrock and seasonal watertable.

All of the remaining soil types, in the Town of Caroga, are classified by the Soil Conservation Service as having severe development limitations. The Alluvial soils are subject to flooding and the Organic Deposit soils are limited by wetness, flooding and frost action. The Canaan areas are non-soils, limited by the lack of soils over bedrock.

A detailed list of characteristics common to the soils of Caroga (Table 2) was prepared by the Soil Conservation Service to accompany the soil inventory map. This is a valuable reference tool regarding the development capabilities of various areas. This data source should be consulted during the project review process to identify potential problems prior to conducting on-site inspections. Although most associations within Caroga have been described as having serious limitations for community development, certain aspects of these problems can be overcome through proper precautions. The availability of this soil inventory and list of soil characteristics should contribute to a greater awareness of the potential development problems within Caroga.

Due to the limitations inherent in a meso-intensity soil survey, it is recommended that more detailed soils information be sought. When such additional information is available, revisions should be made in the future Town Plan and subsequent land use controls.

TABLE 2

SOIL CHARACTERISTICS OF CAROGA

Deep Soils Without Fragipans Developed in Glacial Till

NAME	#	PARENT MATERIAL	SLOPE GROUP	% OF ASSN.	DEPTH TO BEDROCK	SEASONAL WATERTABLE	PERMEABILITY* A	B	C	DRAINAGE	STONINESS	EROSION POTENTIAL	LIMITATION FOR COMMUNITY DEVELOPMENT (DEGREE)	LIMITATION FOR COMMUNITY DEVELOPMENT (REASON)
Charlton	1	Glacial Till on Uplands	Sloping	65%	> 5'	3-10'	0- 6 .6- 6	6-26 .6- 6	26-42 .6- 6	Well	Very Stony	Low	Moderate	Stones
Charlton-Hollis	2	Glacial Till on Uplands	Sloping	40% 30%	> 5' < 20"	3-10' > 6'	.6- 6 0- 6 0- 2 2- 6	.6- 6 6-26 2-15 2- 6	.6- 6 26-42 - - - -	Well to Excessive	Very Stony	Low Moderate	Moderate Severe	Stones Depth to bedrock
Charlton-Hollis	3	Glacial Till on Uplands	Moderately sloping	40% 30%	> 5' < 20"	3-10' > 6'	.6- 6 0- 6 0- 2 2- 6	.6- 6 6-26 2-15 2- 6	.6- 6 26-42 - - - -	Well to Excessive	Very Stony	Low Moderate	Moderate Severe	Stones Depth to bedrock
Sutton-Leicester	4	Glacial Till on Uplands	Gently Sloping	40% 35%	> 5' > 5'	1½-3½ 0-1½	0- 6 .6- 6 0- 6 .6- 6	6-28 .6- 6 6-30 .6- 6	28-60 .6-20 30-48 2-20	Poor	Stony	Low	Severe	Wetness Frost action

Deep Soils With Fragipans Developed in Glacial Till

NAME	#	PARENT MATERIAL	SLOPE GROUP	% OF ASSN.	DEPTH TO BEDROCK	SEASONAL WATERTABLE	PERMEABILITY* A	B	C	DRAINAGE	STONINESS	EROSION POTENTIAL	LIMITATION FOR COMMUNITY DEVELOPMENT (DEGREE)	LIMITATION FOR COMMUNITY DEVELOPMENT (REASON)
Brayton Dannemora	5	Glacial Till on Uplands	Gently Sloping	40% 30%	> 5' > 5'	0-1 0-1½	0- 7 .6- 2 0- 8 .6- 6	7-18 .6- 2 8-16 .6- 6	18-45 .06-.2 16-48 .06-.2	Poor	Stony Very Stony	Low	Moderate-Severe Severe	Wetness, Frost Wetness
Potsdam Canaan	11	Glacial Till on Uplands, Plains	Sloping	35% 35%	> 5' 5/6-1 2/3'	1½-3 > 6'	0- 9 .6- 2 0- 9 2-20	9-24 .6- 2 9-17 2-20	24-80 .06-.2 - - - -	Well Excessive	Very Bouldery Bouldery	High Moderate	Slight Severe	- - Depth to bedrock
Potsdam Canaan	12	Glacial Till on Uplands, Plains	Moderately Sloping	35% 35%	> 5' 5/6-1 2/3'	1½-3 > 6'	0- 9 .6- 2 0- 9 2-20	9-24 .6- 2 9-17 2-20	24-80 .06-.2 - - - -	Well Excessive	Very Bouldery Bouldery	High Moderate	Slight Severe	- - Depth to bedrock
Potsdam Crary	13	Silty Mantle & Underlying Till on Uplands	Sloping	40% 25%	> 5' > 5'	1½-3 ½-2	0- 9 .6- 2 0- 8 .6- 2	9-24 .6- 2 8-24 .6- 2	24-80 .06-.2 24-60 .06-.2	Well Poor	Very Bouldery Very Bouldery to Stony	High	Moderate Severe	Wetness, Boulder Frost Action Wetness
Ridgebury Whitman	14	Glacial Till on Uplands	Nearly Level	35% 30%	> 5' > 5'	0-1½ 0-1½	0- 6 .6- 6 0- 8 .6- 6	6-16 .6- 6 8-15 .6- 6	16-42 < .6 15-30 < .6	Poor Very Poor	Bouldery	Moderate	Severe	Wetness

SOIL CHARACTERISTICS—OF THE TOWN OF CAROGA (CON'T)

NAME	#	PARENT MATERIAL	SLOPE GROUP	% OF ASSN.	DEPTH TO BEDROCK	SEASONAL WATERTABLE	PERMEABILITY* A	B	C	DRAINAGE	STONINESS	EROSION POTENTIAL	LIMITATION FOR COMMUNITY DEVELOPMENT (DEGREE)	LIMITATION FOR COMMUNITY DEVELOPMENT (REASON)
							Moderately Deep and Shallow Soils							
Scarboro	18	Terraces & Outwash Plains	Nearly level	70%	>5'	0-1' 2-6	0-6 >6	6-28 >6	28-50	Very Poor	--	Low	Severe	Wetness
							Deep Soils Developed in Glacio-Fluvial Deposits							
Hinkley	23	Glacial Outwash on Deltas, Kames & Eskers	Gently Sloping	75%	5'	6'	0-7 >6	7-15 >6	15-40 .>6	Excessive	--	--	Slight	--
Hinkley	24	Glacial Outwash on Deltas, Kames & Eskers	Moderately Sloping	75%	>5'	6'	0-7 >6	7-15 >6	15-40 76	Excessive	--	--	Slight	--
							Deep Soils Developed in Alluvial Deposits							
Alluvial	25	Flood Plains	--	70%	--	--	--	--	--	Poor Very Poor	--	High Flood Plain	Severe	Flooding
							Soil Developed in Organic Deposits							
Carlisle Palms	26	Organic Material	--	50% 30%	>5' >5'	0-1' 0-1'	0-6 6-20 0-35 6-20	-- -- .6-2 --	-- -- -- --	Very Poor	--	Low	Severe Severe	Wetness, Floods, & Frost Action
Greenwood Cathro	27	Organic Materials near swamps & bogs	--	45% 30%	>5' >5'	0-1' 0-1'	0-6 10-20 0-11 6-20	6-60 6-20 11-23 6-20	-- -- 23-60 .2-2	Poor	--	Low	Severe Severe	Wetness, Frost Wetness
							Non-Soil Areas							
Rock Outcrop Canaan	28	Glacial Till on Bedrock Uplands	--	35% 30%	0 5/6-1 2/3	0 >6'	-- 0-9 2-20	-- 9-17 2-20	-- -- --	Well Excessive	Rock	Low to None Moderate	Severe	Bedrock Depth to Bedrock

*Permeability of Soil Horizon: The three columns refer to the layers of mineral soil below the surface beginning with the first layer, or "A" horizon. The numbers on the top of each row indicate the depth of the soil horizon from the surface; the numbers on the bottom indicate the rate water moves through the soil expressed in inches per hour.

DATA SOURCE: General Soils of the Adirondack Park; Prepared by the Soil Conservation Service, 1973.

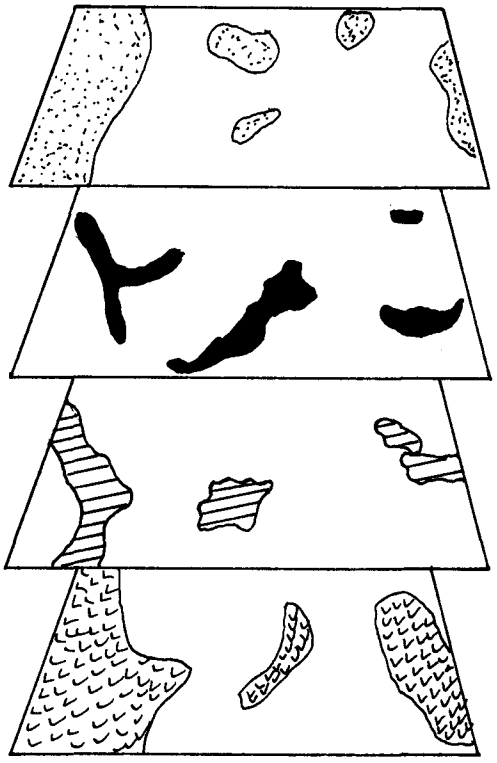
CHAPTER III

SOIL SUITABILITY FOR SEPTIC SYSTEMS

Since the major development constraint in Caroga concerns the capability of soils to provide for minimal septic system efficiency, Cornell University's Remote Sensing Program was requested to analyze the elements important to septic system suitability. This project, supported by a National Aeronautics Space and Administration grant, was designed as a demonstration of how aerial photographs can be used for practical planning and development purposes.

This study* provides an assessment of how depth to soil over bedrock, depth to groundwater, slope and stone/boulder limitations would affect the suitability of soils for minimal septic system efficiency. The applicability of these soil-related assessments to areas smaller than 10 acres in size is limited. When an individual development is proposed, on-site investigation is necessary, since the reliability of this general information may vary within small areas.

Four map overlays were prepared, at a scale of 1" = 2,000', identifying the extent of limitations imposed by each of the following conditions:



DEPTH TO SOIL OVER BEDROCK

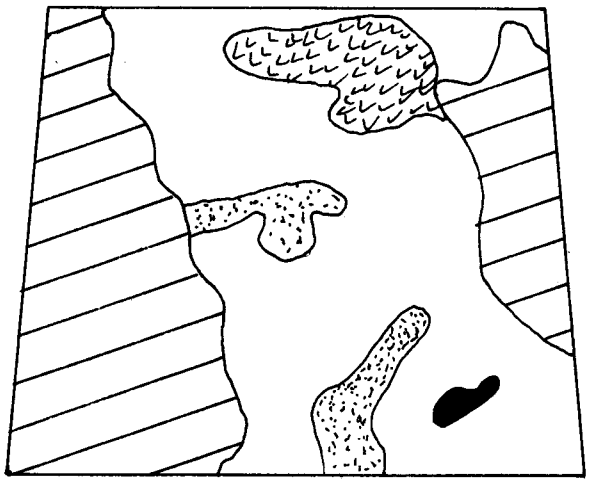
LEVELS OF GROUNDWATER

SLOPE LIMITATIONS

STONE/BOULDER LIMITATIONS

*An Airphoto Assessment of Land Suitability for Septic Tanks in the Town of Caroga, New York; Remote Sensing Program, Cornell University; May, 1977.

The boundaries of the areas identified on the four maps on the preceding page were transferred to a composite map, summarizing the limitations for septic systems.



COMPOSITE OF LIMITATIONS FOR SEPTIC SYSTEMS.

A map and brief description for each of the map overlays illustrated on the preceding page follows in this report.

DEPTH TO SOIL OVER BEDROCK

The depths of soil over bedrock were categorized as follows:

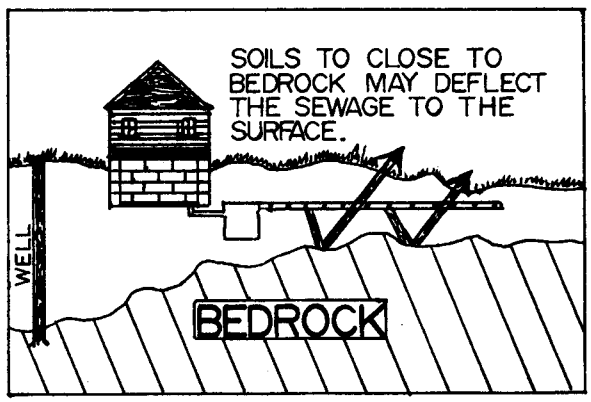
TABLE 3
Soil Depths to Bedrock

Description	Depths	Map Code
Shallow	0- 5 feet	■
Shallow to Medium		None
Medium	5-10 feet	None
Medium to Deep		None
Deep	Over 10 feet	None

Materials utilized in categorizing the various depths to bedrock included the stereoscopic analysis of April 1968, 1:24,000 scale, panchromatic aerial photographs, selected field checks, available well data and referencing the Fulton County General Soils Report.*

A severe rating was applied to shallow soils, which range in depth from zero to five feet. The Department of Health's most recent model sanitary code** recommends at least four feet of usable soil above bedrock.

Adequate soil depths are needed beneath the subsurface tiles of septic systems to provide further treatment of the effluents and to prevent pollution of water supplies.



*Fulton County General Soils Report, United States Department of Agriculture, Soil Conservation Service, 1971.

**Individual Household Systems; Waste Treatment Handbook; New York State Department of Health.

TOWN OF

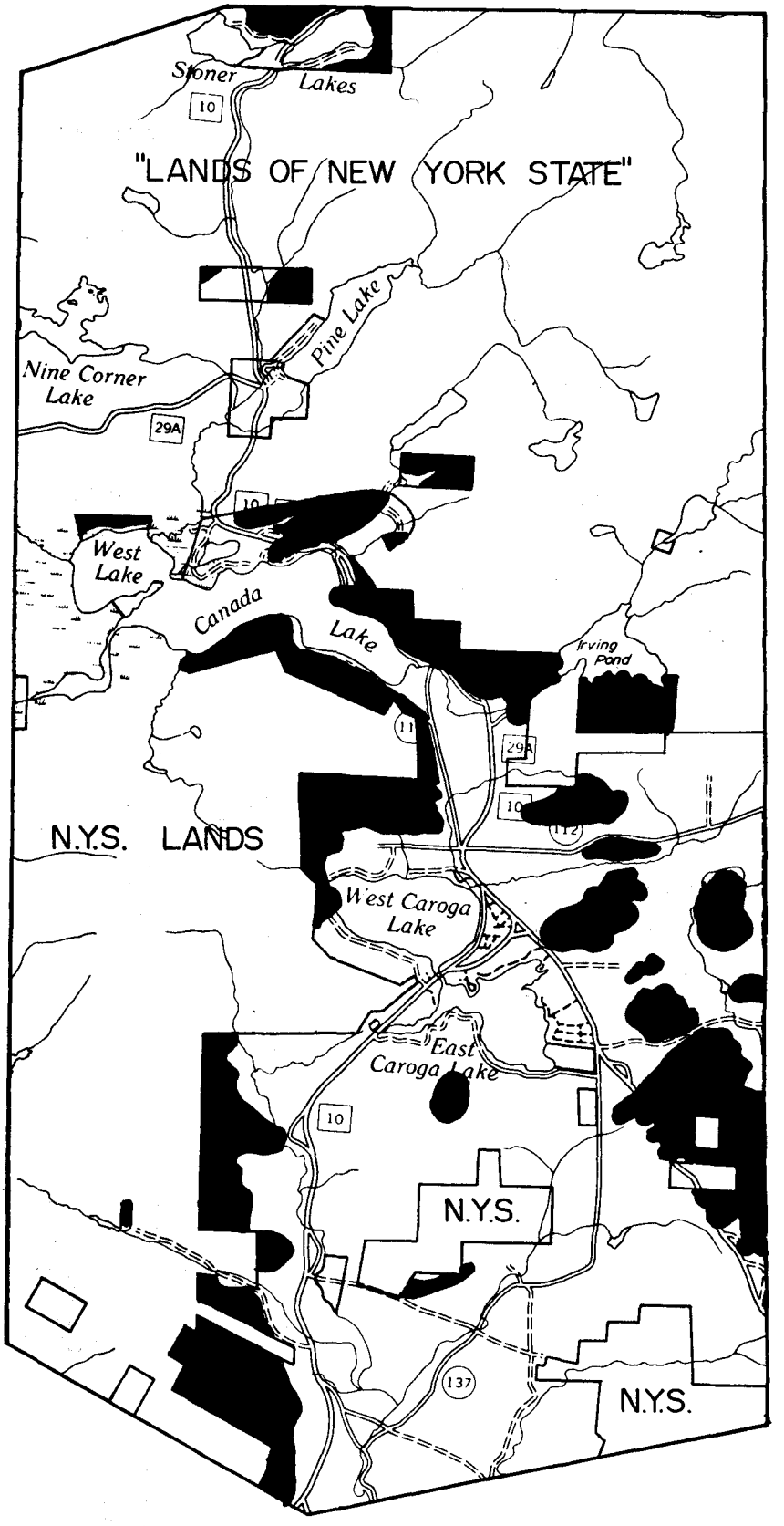
CAROGA, N.Y.

Legend

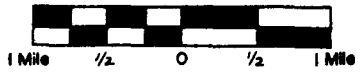
DEPTH OF SOIL OVER BEDROCK

SHALLOW

ALL RATINGS ARE ON PRIVATE LAND.



Scale



DATA SOURCE:
CORNELL UNIVERSITY REMOTE SENSING PROGRAM, DEC. 1976.

LEVELS OF GROUNDWATER

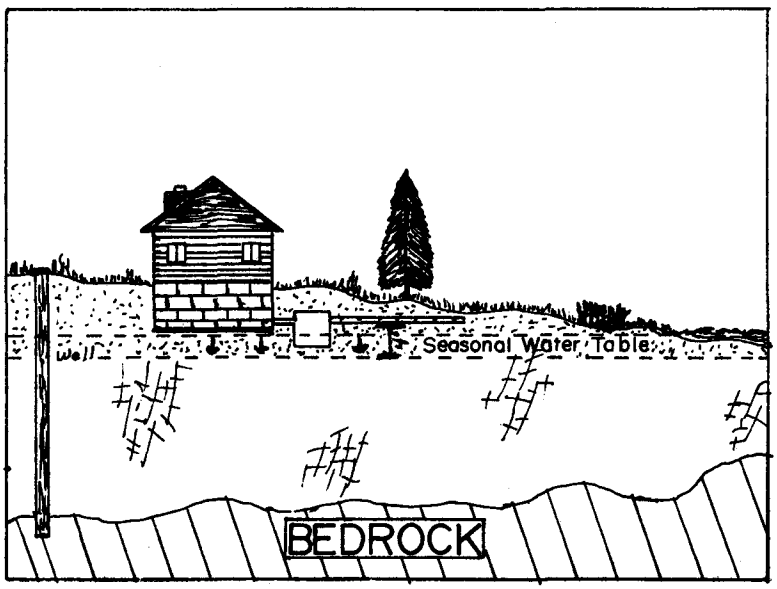
Groundwater levels were categorized as follows:

TABLE 4
Groundwater Levels

Description	Limitations	Map Code
High year-round	Severe	■
Seasonally high	Moderate/Severe	None
Relatively low most of year	Slight	None

Although soils with fragipans were not delineated separately, areas with impeded drainage would be recognized as having a high or seasonably high watertable. In general, the limitations imposed on development by groundwater levels increase as the water level comes closer to the ground surface, for increasingly longer periods of time.

A severe rating was applied to areas with high levels of groundwater throughout the year. The Department of Health's model sanitary code recommends at least four feet of usable soil above the high seasonal groundwater level. If a septic system leachfield is saturated with groundwater, it is incapable of performing its dual function of absorbing and filtering septic effluents.



SOILS CANNOT FILTER SEWAGE IF ALREADY SATURATED WITH WATER.

FOUR FEET OF USABLE SOIL IS RECOMMENDED ABOVE SEASONAL WATER TABLE.

TOWN OF

CAROGA, N.Y.

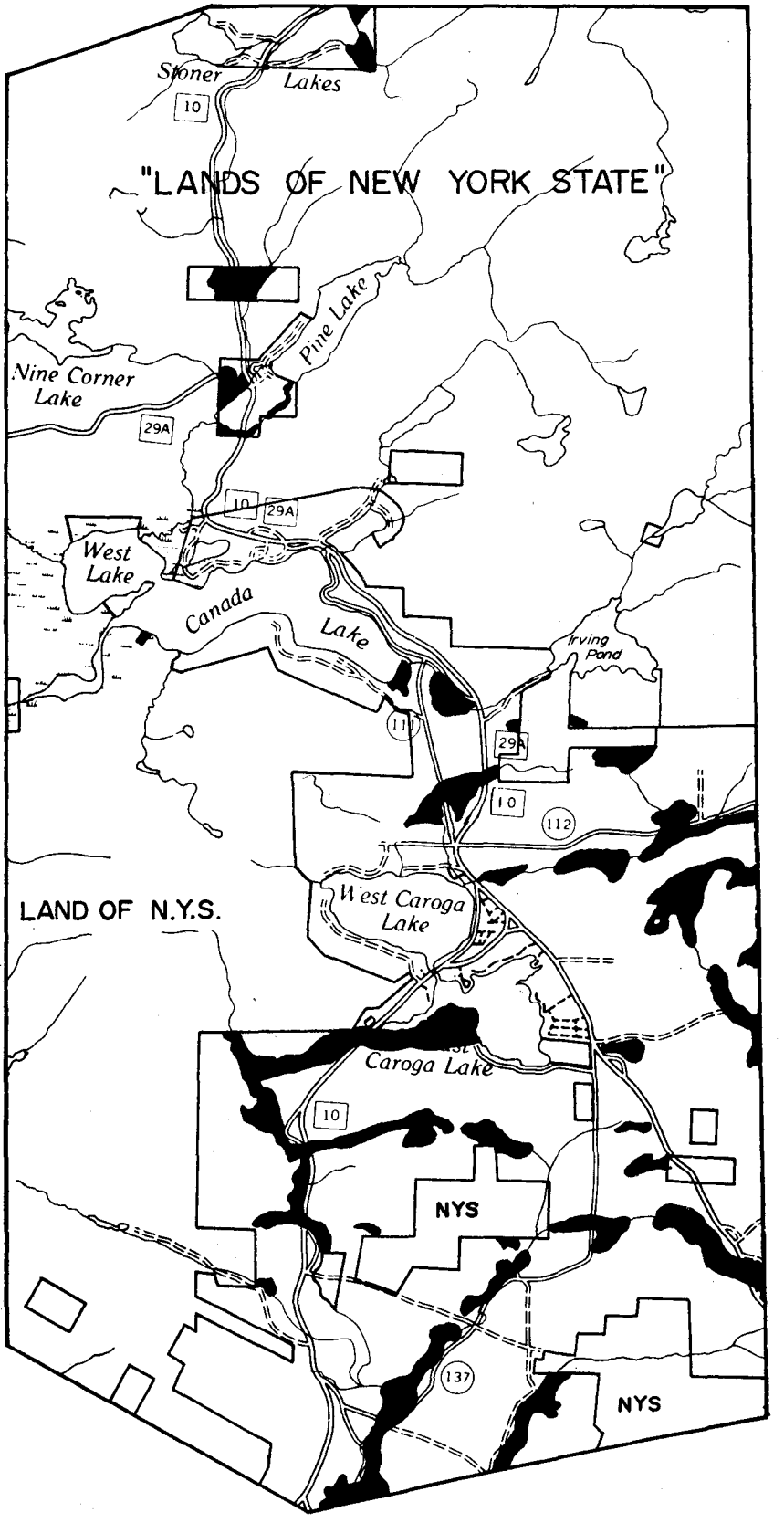
MAP IV

Legend

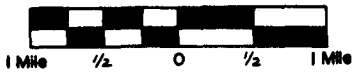
LEVEL OF GROUNDWATER

HIGH YEAR-ROUND

ALL RATINGS ARE ON PRIVATE LAND.



Scale



DATA SOURCE:
CORNELL UNIVERSITY REMOTE SENSING PROGRAM, DEC. 1976.

SLOPE

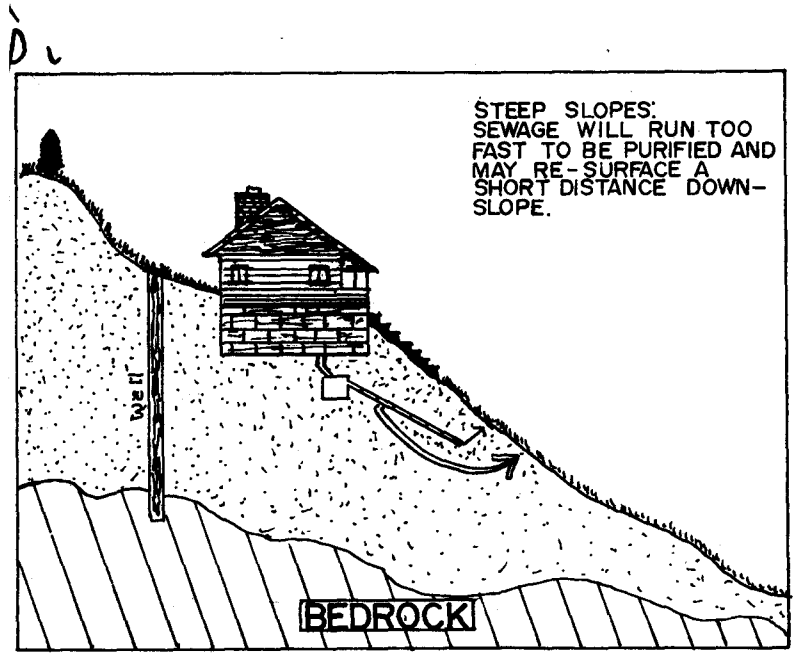
Slope limitations were categorized as follows:

TABLE 5
Slope Limitations

Slope Group	Limitations	Map Symbol
0- 8%	Slight	None
8-15%	Moderate	None
15+%	Severe	■

In general, limitations imposed by slope increase as the slope increases. The Department of Health's model sanitary code recommends that slopes greater than 15 percent be avoided for sewage disposal systems. Steep slopes generally fail to provide for adequate filtering of sewage effluent, with the wastes frequently resurfacing short distances down slope.

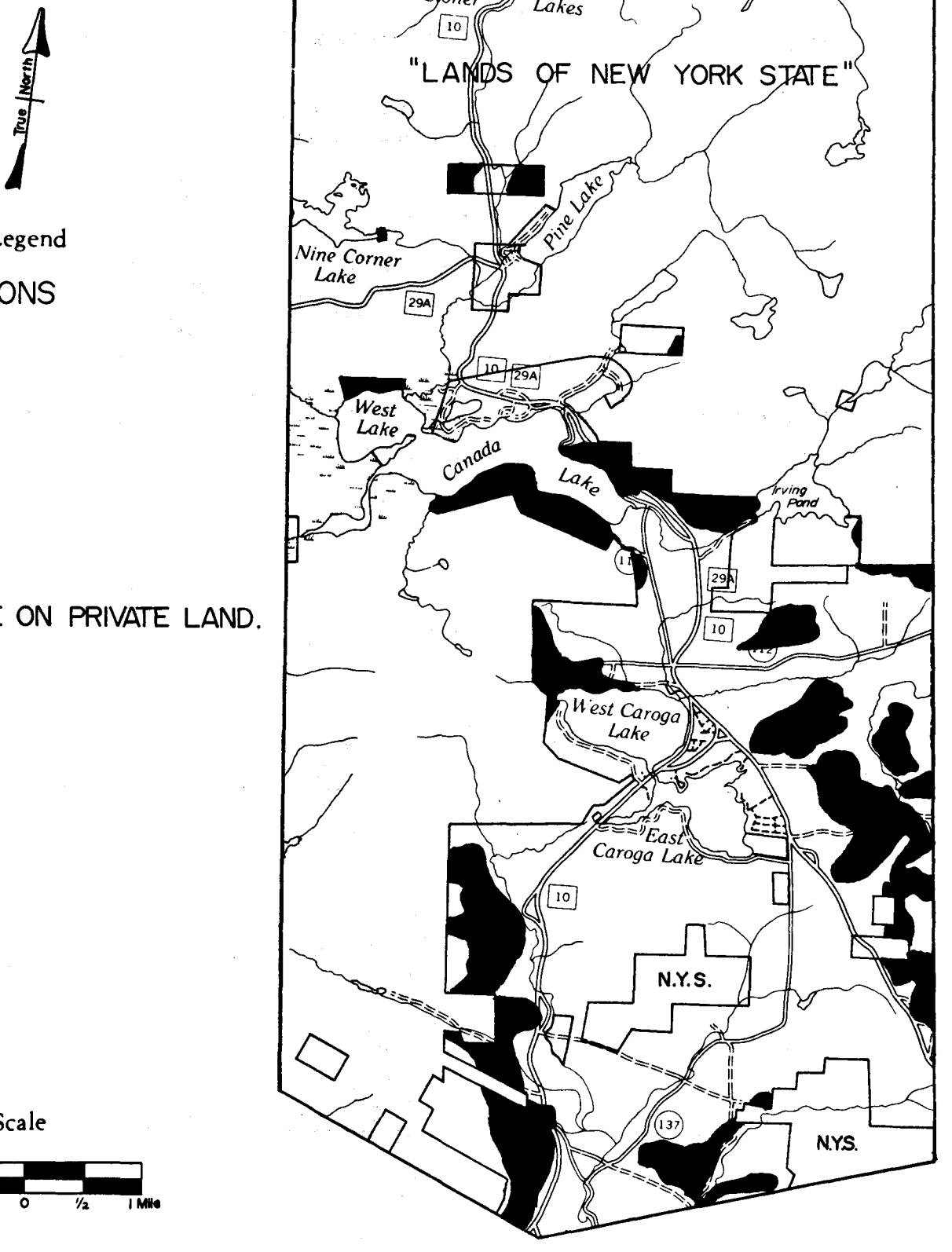
Erosion, siltation and highway construction problems also result from construction activities in the steep and very steep areas of Caroga. Refer to Chapter 1 of this report for reference to the slope limitations ---- ited to septic systems.



TOWN OF

CAROGA, N.Y.

MAP V



DATA SOURCE:
CORNELL UNIVERSITY REMOTE SENSING PROGRAM, DEC. 1976.

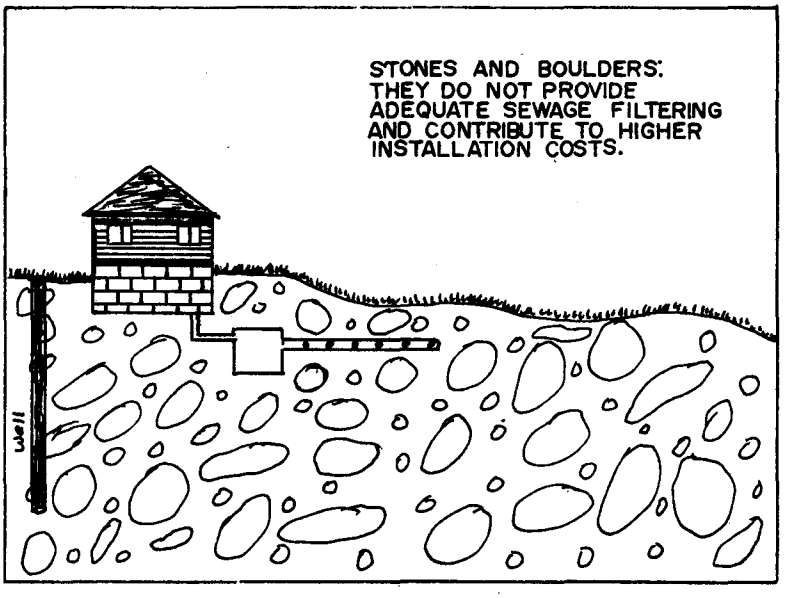
STONES/BOULDERS

Stone/boulder limitations were categorized as follows:

TABLE 6
Stone/Boulder Limitations

Limitations	Map Code
Slight	None
Slight to Moderate	None
Moderate	None
Moderate to Severe	None
Severe	■

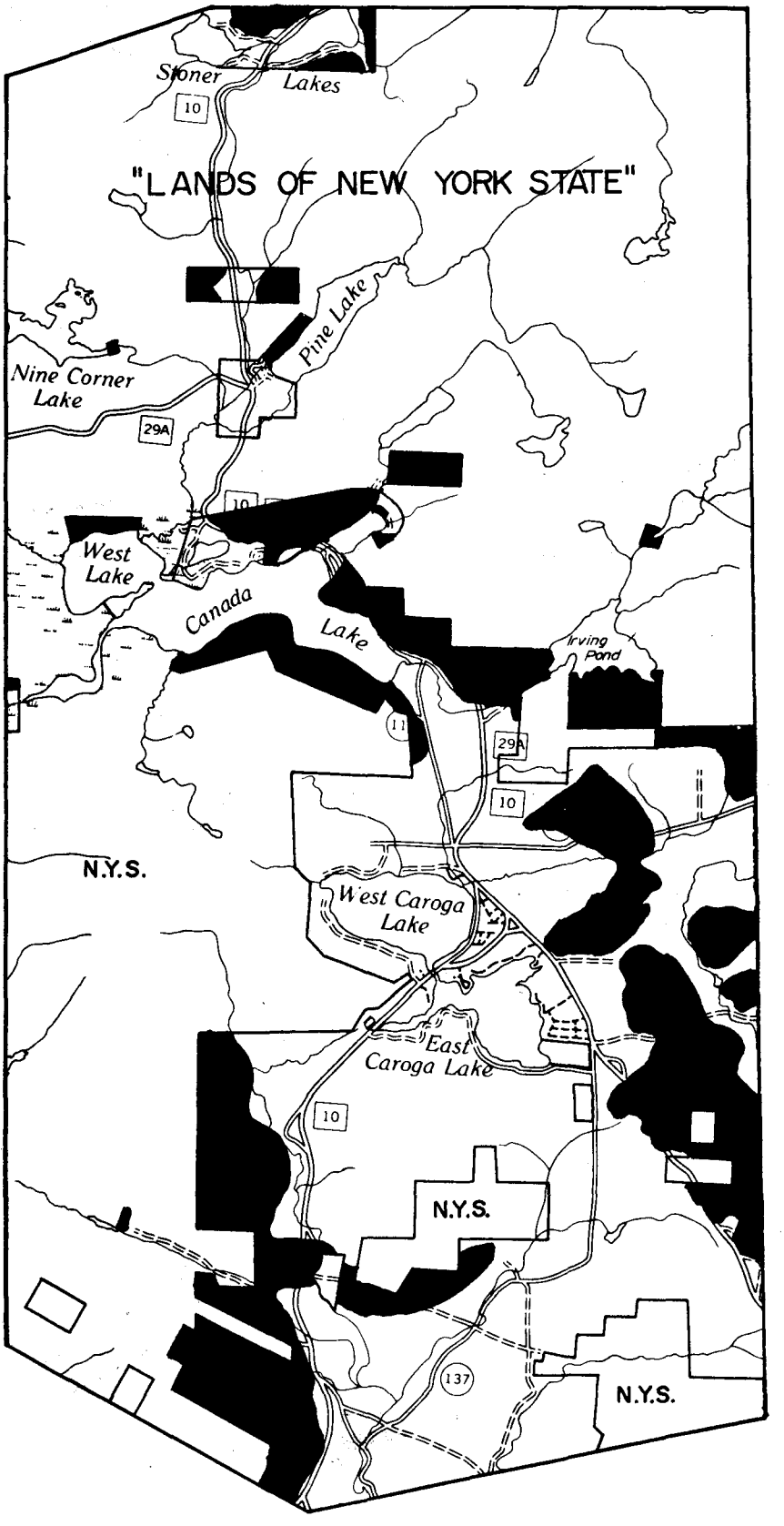
Ratings were applied to areas depending on the degree to which stones in the soil profile would affect septic system construction and operation.



TOWN OF

CAROGA, N.Y.

MAP VI



Legend

STONE/BOULDER LIMITATIONS

■ SEVERE

ALL RATINGS ARE ON PRIVATE LAND.

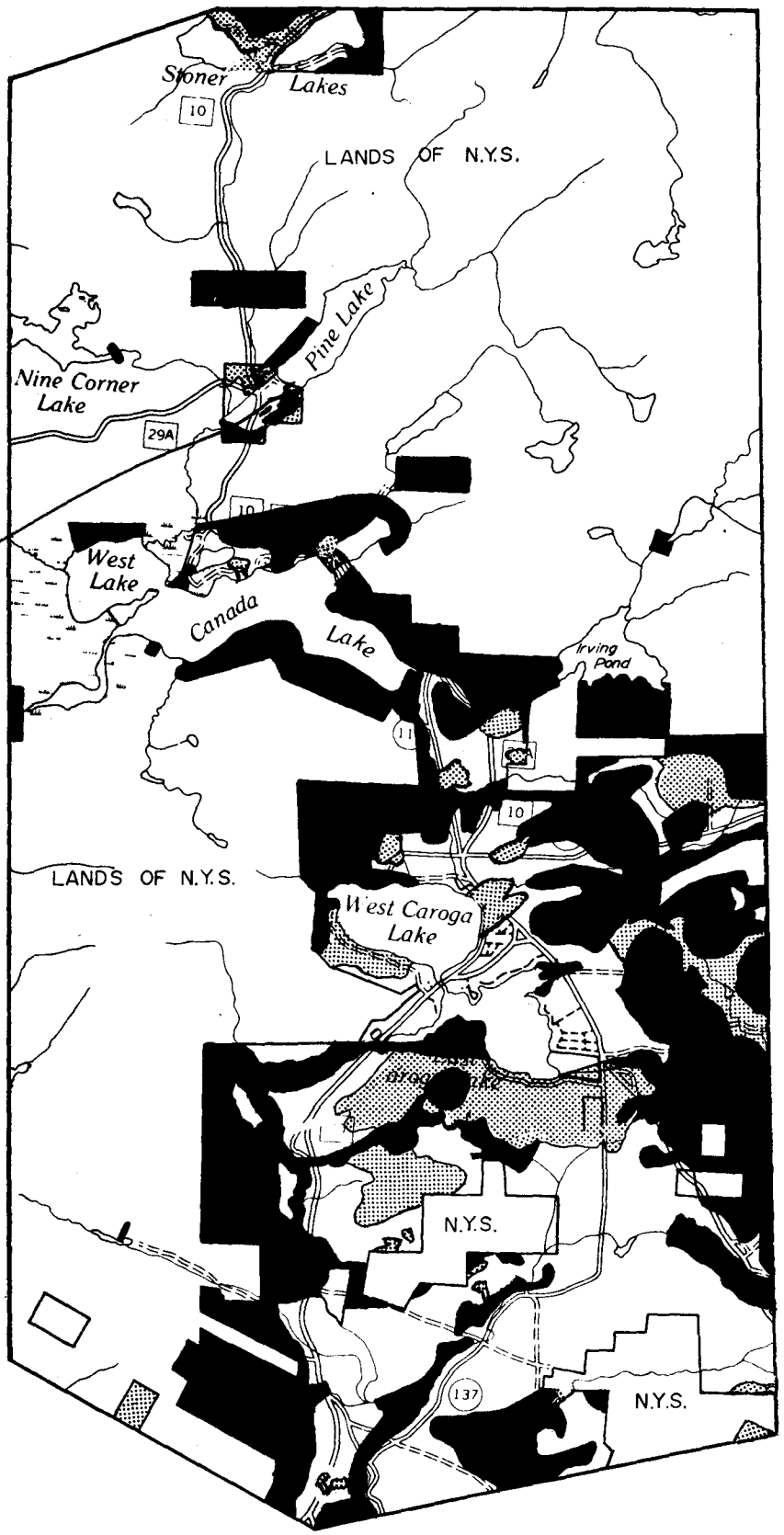
Scale

DATA SOURCE:
CORNELL UNIVERSITY REMOTE SENSING PROGRAM, DEC. 1976.

TOWN OF

CAROGA, N.Y.

MAP VII



True North

Legend

LIMITATIONS for SEPTIC TANKS

SEVERE

MODERATE to SEVERE

NOTES:

1. SEVERE RATINGS MAY IN CERTAIN INSTANCES BE OVERCOME THROUGH CAREFUL DESIGN.
2. MORE EXACT BOUNDARIES ARE AVAILABLE ON LARGER SCALE MAPS AT THE FULTON COUNTY PLANNING DEPARTMENT.

Scale

1 Mile ½ 0 ½ 1 Mile

DATA SOURCE: CORNELL UNIVERSITY REMOTE SENSING PROGRAM, DEC. 1976.

COMPOSITE RATINGS

The composite ratings of limitations for septic tanks generally summarizes the detailed information shown on the four preceding maps. This composite map has several uses, including its use as a tool in developing the Town Plan; its usefulness to prospective developers through the identification of the types of problems which may be encountered in developing general areas; and, finally, the composite ratings of limitations for septic tanks will be useful to the Planning Board as a tool in reviewing project applications. The following matrix indicates the various combinations of factors which result in the composite ratings of limitations for septic tanks in Caroga.

	Map III					Map IV			Map V			Map VI				
	DEPTH TO BEDROCK					GROUNDWATER			SLOPE			STONE/BOULDER LIMITATION				
Map VII COMPOSITE RATINGS	0- 5'	(0-10)	5-10'	(5-10)	+10	High Year Round	Seasonally High	Relatively Low	+15%	8-15%	0- 8%	Severe	Moderate to Severe	Moderate	Slight to Moderate	Slight
Slight					O			O			O					O
Slight to Moderate				O				O			O				O	
Moderate			O					O			O					O
Moderate					O			O		O						O
Moderate					O			O			O			O		
Moderate to Severe		O						O			O				O	O
Moderate to Severe				O	O		O				O				O	O
Moderate to Severe				O	O			O			O		O			
Moderate to Severe			O					O		O					O	O
Moderate to Severe			O					O			O			O		
Moderate to Severe				O	O			O		O				O		
Severe		ALL					OTHER			COMBI		NATIONS				