

environmental review team report



RC & D

**EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT**

**ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE,
SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES**

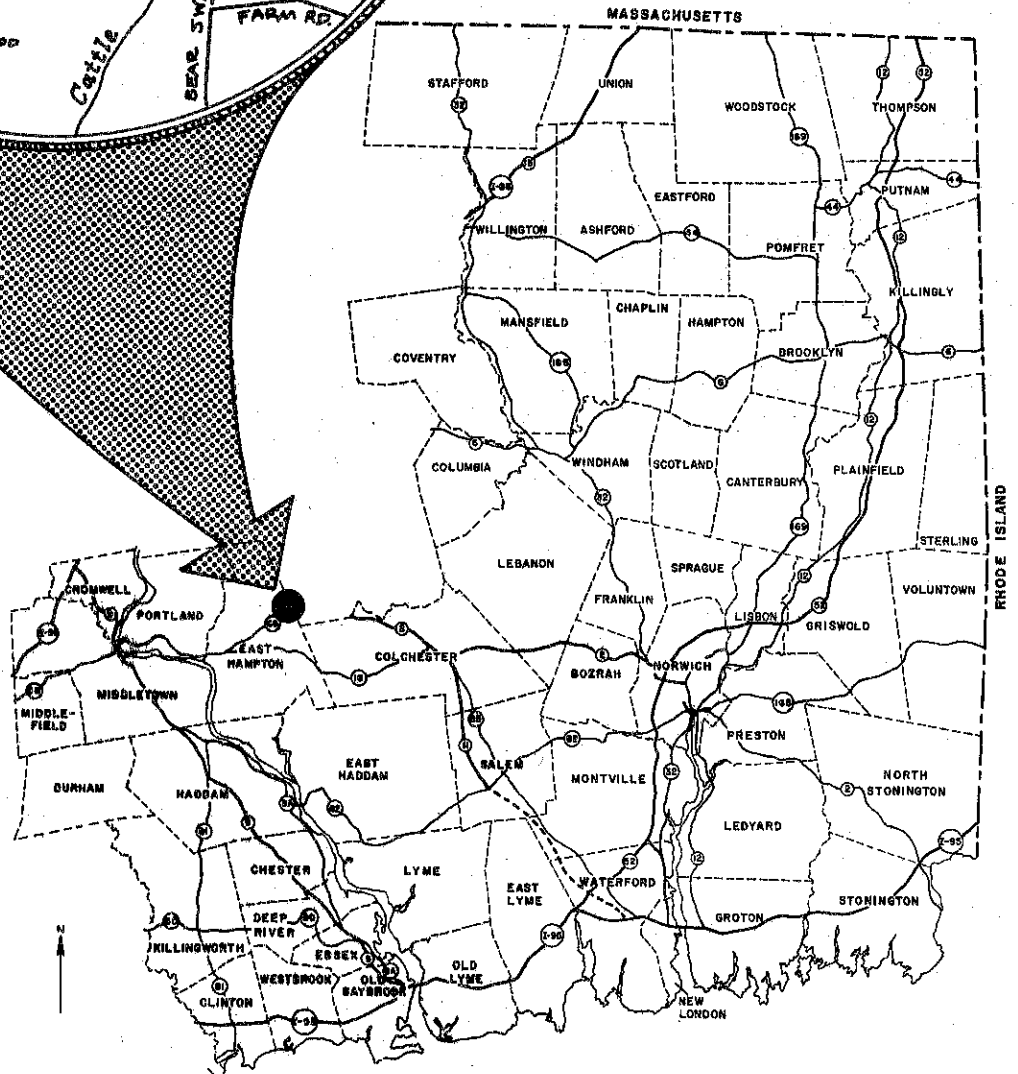
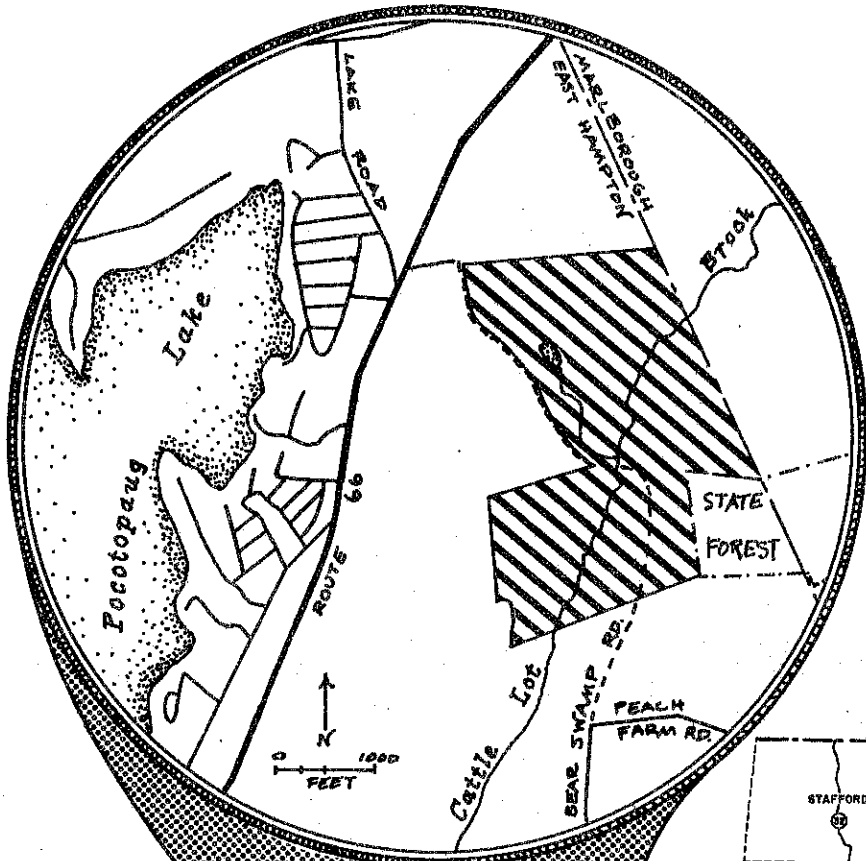
ENVIRONMENTAL REVIEW TEAM REPORT
ON
BEAR SWAMP ROAD SUBDIVISION
EAST HAMPTON, CONNECTICUT
JULY, 1976

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the Housing and Community Development Act
of 1976, 24 CFR, Part 570, Section 570.406.*

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

BEAR SWAMP ROAD SUBDIVISION EAST HAMPTON, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
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EAST HAMPTON, CONNECTICUT

This report is an outgrowth of a request from the East Hampton Inland Wetlands Commission, with permission of the landowners, to the Middlesex County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource, Conservation and Development (RC&D) Project Executive Committee for their consideration and approval as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

The ERT that field-checked the site consisted of the following personnel: Barry Cavanna, District Conservationist, SCS; Marc Crouch, Soil Scientist, SCS; Robert Miller, Geologist, Connecticut Department of Environmental Protection (DEP); Charles Phillips, Fisheries Biologist, DEP; Robert Rocks, Fisheries Assistant, DEP; Huber Hurlock, Forester, DEP; Gregory Bonadies, Sanitarian, Connecticut Department of Health; Leonard Tundermann, Regional Planner, Midstate Regional Planning Agency; and Linda Simkanin, ERT Coordinator, Eastern Connecticut RC&D Project.

The Team met and field-checked the site on Thursday, April 29, 1976. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of East Hampton. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Miss Linda M. Simkanin, Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to review approximately 177 acres of land for which a single-family home subdivision is proposed. The site is located east of Pocotopaug Lake and Route 66, and the eastern site boundary follows a portion of the East Hampton/Marlborough town line.

The site is presently undeveloped and is within close proximity to a seasonal residential development on Pocotopaug Lake in East Hampton. The land is currently zoned for residential use on 1 1/2 acre lots. Water retrieval and sewage disposal would have to be developed on-site. The Team reviewed the property relative to the developer's general proposal to subdivide the property into 35-40 building lots, with a possible large pond creation around which to establish some larger lots.

The present land uses include extensive wetland and wooded upland slopes. The Cattle Lot Brook and Bear Swamp Wetland divides the property. Numerous intermittent streams drain into the wetland.

Some aspects of the proposed development discussed by the Team involve pond creation, waste disposal, the need for an erosion and sedimentation control plan to reduce the potential hazard of siltation and possible pollution into the large wetland, the desirability of building over streams rather than rerouting them.

The report will also describe the natural characteristics of the site including topography, geology, soils, forest cover, fish habitat, and the Cattle Lot Brook Bear Swamp Wetland. Consideration will be given to the compatibility and suitability of the development relative to the natural resource base. Comments or recommendations made within the report are presented for consideration by the developer and the town in the preparation and review of the development plans, and should not be construed as mandatory or regulatory in nature.

TOPOGRAPHY AND GEOLOGY

The site of the proposed subdivision development lies within a glacially carved valley. Cattle Lot Brook divides the site approximately in half. The brook flows in a northeasterly direction. The topography of the site is characterized by steep valley walls on the west side of Cattle Lot Brook and a broad flat valley which slowly rises on the east side of the brook.

Approximately 40% of the site is covered by slopes equal or greater than 15%. It is advisable to observe extra caution in the siting and design of subsurface sewage facilities in these areas.

Surficial Geology

The majority of deposits found on the site are till and glacial swamp deposits. As the Topography and Surficial Geology map on the next page indicates, the upland till and lowland swamps are divided by a thin layer of colluvial material.

Till is described as compact to friable clay, silt and sand with variable amounts of pebbles and boulders. The fact that till is a conglomeration of all grain sizes, it is extremely difficult to establish rates of ground water movement through it. It is advisable to use extra caution when designing water supply wells and subsurface sewage disposal systems in till areas.

The majority of swamp deposits found on the site are located on either side of Cattle Lot Brook. A few small areas were located in the upland till areas. These smaller areas are underlain by till while the large Cattle Lot Brook area is underlain by bedrock.

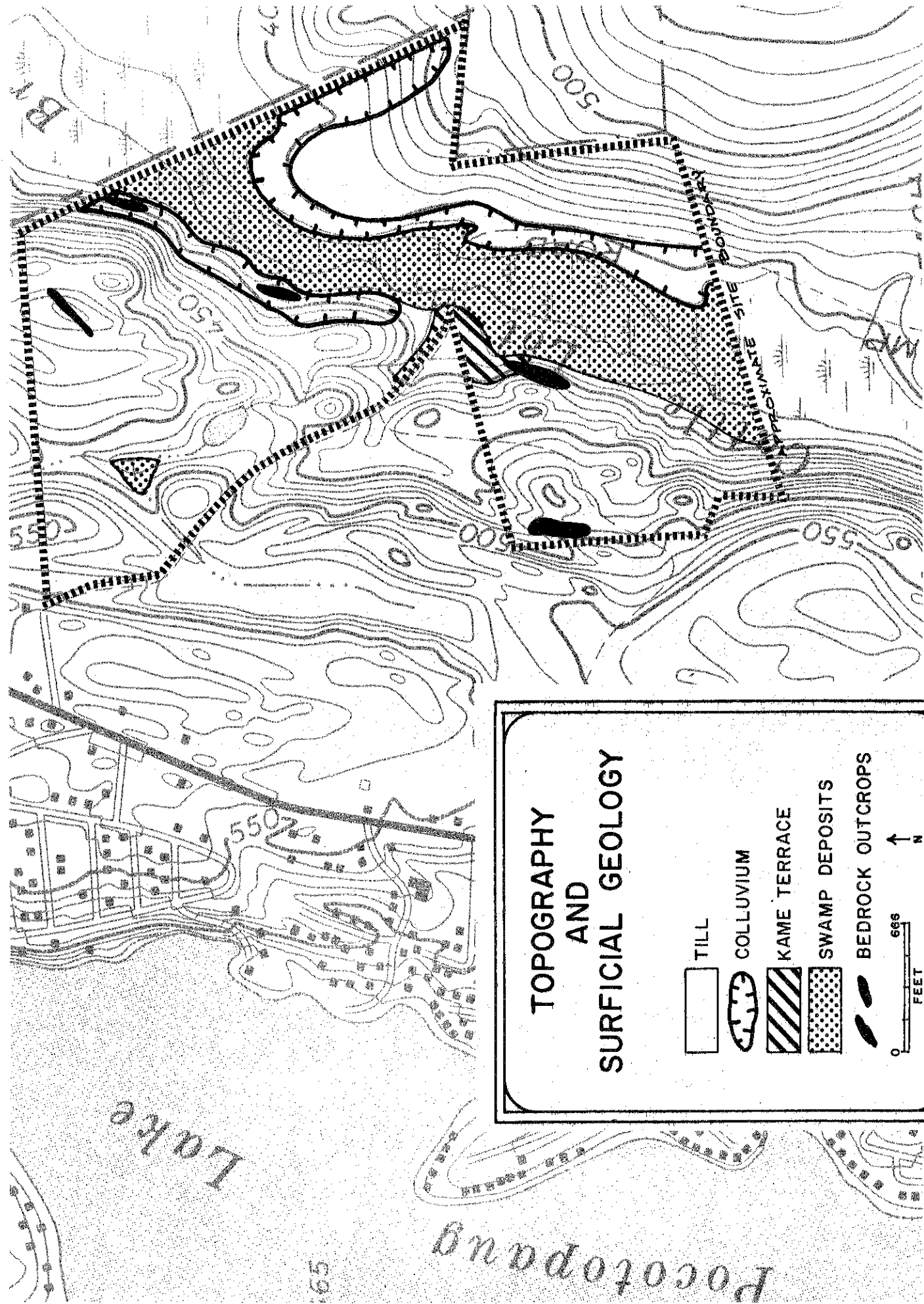
The thin colluvium deposit, which separates the upland till from the swamp deposits is composed of mixed sand and gravel, silt, variable organic material and in some places, boulders. The origin of this material is local and due to its nature, probably washed down from the steep slopes immediately above it.

The only surficial material found to be of economic importance on the site, which is accessible and minable, is a small kame terrace deposit. The kame deposit is chiefly dark yellowish-brown, coarse to fine sand and gravel with rusty schist pebbles. Kames were formed during the retreat of glaciers by melting glacier ice against valley walls.

Bedrock Geology

The type of bedrock found in this area is predominantly Brimfield schist. A small diabase dike cuts through the schist on the northwest corner of the property.

The Brimfield schist is gray or rust-like in color and in many places is abundant in small garnets. The major composition of the schist found on the site was biotite-muscovite schist and quartz-biotite schist. Both were found to be of equal abundance. The micaceous schists of this area deteriorate rapidly on exposure to the atmosphere by the conversion of sulfid (pyrrhotite) to yellow and reddish-brown iron oxides and white sulfates which quickly encrust any exposures. They are best identified along fresh outcrops next to the access road which runs through the site.



TOPOGRAPHY AND SURFICIAL GEOLOGY

- TILL
- COLLUVIUM
- KAME TERRACE
- SWAMP DEPOSITS
- BEDROCK OUTCROPS



As indicated on the Topography and Surficial Geology Map, there are numerous outcrops located on the west side of Cattle Lot Brook. This area is extremely shallow to bedrock. The map only indicates areas of large outcroppings, many smaller ones were located during the field review. Although the shallow bedrock surface make excellent bases for foundations, they do create problems in design of subsurface sewage disposal and in the placement of onsite water supply wells. Possible further investigation may be needed when designing in shallow bedrock areas.

Hydrology

The site investigated lies approximately in the central portion of the Cattle Lot Brook drainage area. The area encloses approximately 2.0 square miles. The flow of Cattle Lot Brook is in a general northeast direction. The low flow value of the brook through the site was not calculated. This value should be investigated further though as any planned development around the wetland area may effect the low flow value. The extent of the area potentially subject to flooding is shown in the Flood Prone Area map. According to source material from the United States Geologic Survey (USGS), the area indicated as flood prone has a one in 100 years recurrence level, meaning that at least once in 100 years the flood water will probably reach the level indicated. Of course, it should also be noted that this is a statistical flood level and that the levels indicated can occur twice in one year or for two successive years or more. A study of soils types will give a good indication as to normal yearly flooding. For safety, the one in 100 years flood level should be used for all design plans.

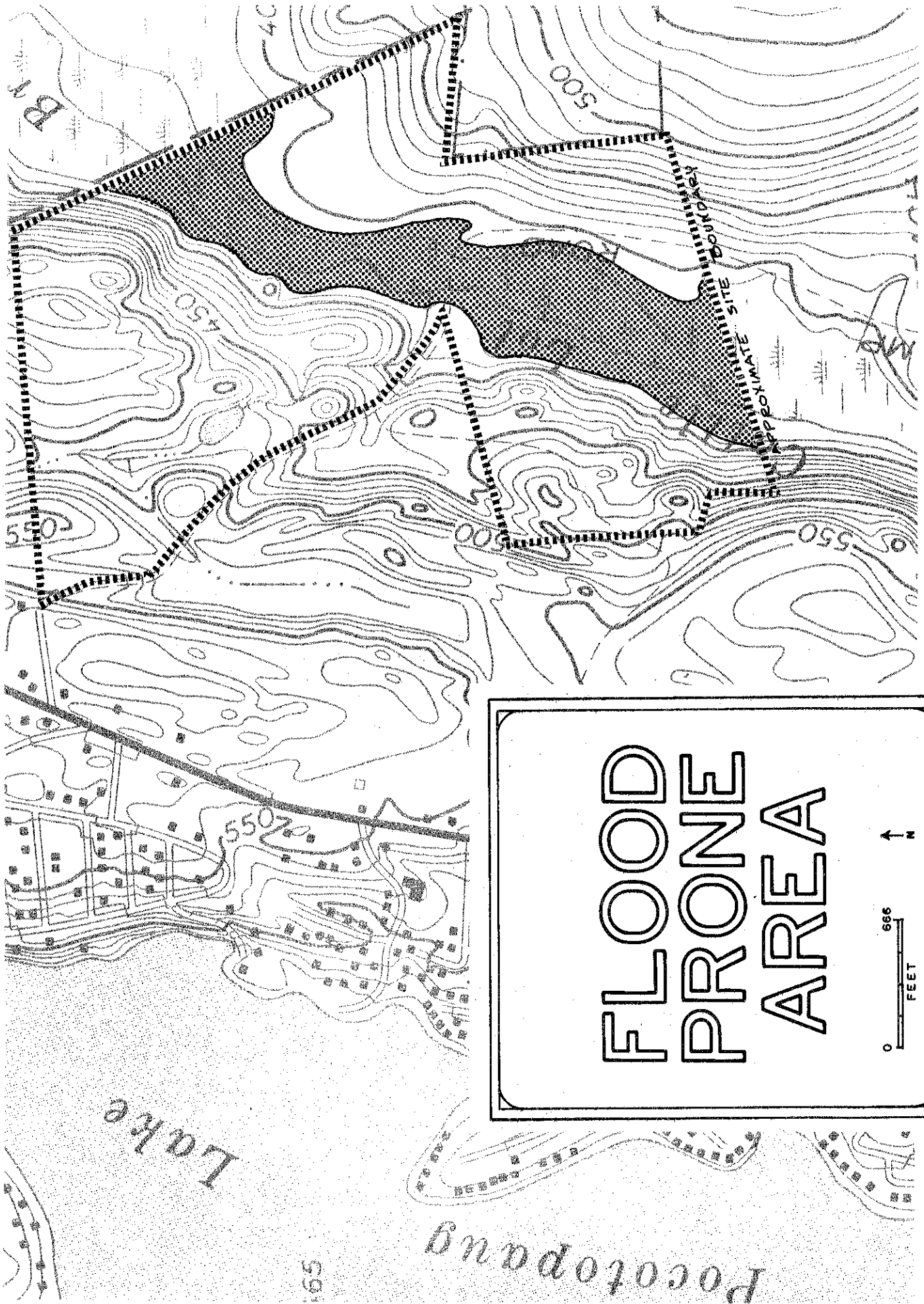
Practically all water supply wells located on the site will be into bedrock. The best location for wells on the property is probably along the fringe of the wetland area. The wells here, as in many bedrock areas, will most likely be of low-yielding capacity.

SOILS

A detailed soil map of the site is given in the Appendix of this report. As the soil map is an enlargement from the original 1,320'/inch to 660'/inch scale, the soil boundary lines shown should not be viewed as absolute boundaries but rather as guidelines to the distribution of soil types on the property. The soils map, along with the SPECIAL SOILS REPORT, Middlesex County (USDA, SCS, 1975), can serve as an educational tool regarding the identification and interpretation of soils.

The soils limitations chart for certain land uses which is found in the Appendix of this report, provides useful information concerning each soil type found on the Bear Swamp site. An explanation of the numbered ratings for particular land uses is provided on the last page of the Appendix. Approximately 98% of the soils on the site exhibit severe limitations for the land uses proposed for this site. In general, the principal limiting factors of the soils are wetness, slope, and shallow depth to bedrock.

Referring to the soil map and soils limitations chart, approximately 98.5 acres are Hollis-Charlton or Hollis-Charlton outcrop soils characterized by steep slopes, bedrock outcrops, and a general shallow depth to bedrock. These soils



**FLOOD
PRONE
AREA**

0 666 FEET

↑ N

present severe limitations for on-site sewage disposal systems, basement construction, and other uses listed in the chart. The bedrock is typically less than two feet below the land surface, with numerous bedrock outcrops (exposed rock surfaces) as were observed during the field inspection. Due to the considerable amount of land having a shallow to bedrock condition, acceptable soil locations for septic systems should be determined before individual house lots are established on a site plan. Within these Hollis-Charlton soils it should be understood that there can be pockets of deep soil which, if found, can provide acceptable locations for development, probably individual house sites. These pockets can tend to be difficult and costly to locate, and may be widely spaced as the site contains areas of very steep slopes (greater than 15%) as well as a somewhat irregular topography in the northwest and southwest portions.

Approximately 52.5 acres of land around the major watercourses and intermittent streams of the site are wet soils such as Scarboro, Sudbury, and a Ridgebury and Whitman unit. The Scarboro (754), and Ridgebury and Whitman unit (43M) soils are very poorly drained. The water table in these soils is normally at or near the surface from late fall through late spring, but may drop below 6 feet during the summer months. It is advisable then not to take percolation tests in these soils during the summer months. The 43M soil is usually occupying low-lying nearly level to very gently sloping areas, while the 754 soil is usually found in low-lying flat or depressed areas. The Sudbury (456A) soil is moderately well drained, however, mottling appears at 14 to 20 inches in depth indicating waterlogging in wet seasons.

The remaining site acreage not yet discussed in detail here is largely Woodbridge (31MC) and a Canton and Charlton unit (6MC). Both of these soils are moderate to well drained extremely stony fine sandy loams, and are found on slopes of 3-15% grade.

Although the soils limitations chart for certain land uses indicates probable severe limitations for approximately 98% of the soils on the Bear Swamp site, the natural limitations do not always preclude the use of land for development. If economics permits greater expenditures for land development and the intended use is consistent with the objectives of local and regional development, many soils and sites imposing difficult problems can be used.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

The site has severe limitations for basement foundations and homesite landscaping again over 98 percent of the acreage because of shallow depth to bedrock or wet or stony soil conditions. Homesite location would have to be very selective, and as mentioned in the above soils section, it is advisable to locate the septic systems and the individual wells before delineating house lots. The septic systems may have to be engineered due to the severity of soil limitations on the site.

Steep slopes as well as the wetland areas will necessitate the preparation of a sediment and erosion control plan. It is important to prevent as much silt as possible from entering Cattle Lot Brook as well as the numerous intermittent streams which periodically drain the site. At the time of the field review, it appeared that the newly created riprapped stream channels were placed along selected intermittent streambeds. These existing channels should be rebuilt to

prevent flooding as presently it appears that the watercourse can overtop the channel on the downstream side. Such uncontrolled runoff can only increase siltation into the Cattle Lot Brook wetland. From the intermittent stream pattern observed at the field review, it appears that there is considerable runoff entering this property from the State Forest and other properties upslope and adjacent to the Bear Swamp subdivision site. This poor drainage problem should also be addressed in any erosion and sediment control plan prepared for this site.

Plans prepared before construction should show how erosion and sedimentation will be kept at a minimum. Two SCS publications, URBAN HYDROLOGY FOR SMALL WATERSHEDS, and EROSION AND SEDIMENT CONTROL HANDBOOK, are available, as are SCS personnel, to assist with the preparation of this control plan.

FOREST COVER

This is a good hardwood growth site with Tulip poplar; red maple; sugar maple; red, white, and black oaks; beech; ash; birches; and hickories. The northern section of the site is pole size while the central and southern sections were very heavily cut and are only sapling size at the present time. The area east of Bear Swamp Road was logged in 1972. The remaining trees pose no hazard to home development.

Red maple is found alone, on wetland pockets scattered over the area, and within the marshy portions of the site on the southern end of the property west of Bear Swamp Road. The red maples have no commercial value in the wet areas.

The southwestern corner of the property consists of mixed hardwood sawlogs, slightly crowded, but on a good growing site. As the depth to watertable and/or bedrock is shallow, resulting in shallow rooting patterns of trees, this area should be thinned by commercial logging 3 to 5 years ahead of any development to make residual trees more wind-firm as roads, septic systems, and basement foundations are installed.

As the site is adjacent to several thousand acres of state forest it is not unique or special in terms of vegetation. The entire site could be managed for timber on a 100 year rotation with 3 commercial thinnings and a clear cut within the 100 years. This would mean the next 60 years with no return from the logged areas.

FISH AND WILDLIFE HABITAT

The primary habitat feature on the site is the Bear Swamp. This wetland acts as a natural sponge for the spring high water levels on Cattle Lot Brook which runs through it. The area proposed for development is interlaced with numerous intermittent streams. As a natural water collection area, it is important to accurately determine on the site, the extent of the potential flood prone area, and to keep any development out of that area. Any erosion or sedimentation from improper development would reduce Bear Swamp's ability to act as a natural sponge for the spring freshet. Siltation would lower the water quality of Cattle Lot Brook.

At the present time, Cattle Lot Brook is stocked with fingerling trout. Any septic effluent or runoff reaching this water system would significantly reduce the quality of the stream for fish life. The proximity of the Town dump upstream from Cattle Lot Brook may be a source of leachate contamination of surface and groundwater supplies. This should be thoroughly investigated before individual wells are developed.

At the time of the field review, the developer for the site indicated plans to create a dug-out (rather than a dammed) pond. The Team was generally not in favor of the pond creation. As mentioned earlier in this report, it is advisable to collect low-flow measurements for this streambelt during the summer months. Also further study is needed to determine if leachate contaminants are entering the wetland system from the upstream Town dumping area. Further, it is possible that the proposed pond would not only act as a settling basin for town dump effluents, but would also reduce the low flow due to increased evaporation thus further reducing water quality in the watershed. If the dug-out pond is determined by the developer to be an essential part of the subdivision plan, the pond should include a by-pass which allows the stream to enter the pond. In this way stream quality should not be affected during construction, and there is less chance of siltation in the pond. This too would have to be addressed in the Sediment and Erosion Control Plan. To benefit upland wildlife, houses should be kept as close to the road as possible.

WATER SUPPLY

Potable water supply for dwellings will have to be provided by on-site, drill-dug wells. The capacity of the site for ground water production is not known as there are no known deposits of water-bearing aquifers except for low-yield ground moraine deposits along Cattle Lot Brook. Although the need for a municipal water supply system is recognized, there are no plans at present to develop one. Again, the proximity of the Town dump upstream on Cattle Lot Brook may be a source of leachate contamination of surface and ground water supplies, and this should be investigated before wells are dug.

WASTE DISPOSAL

Septic waste disposal will also have to be provided on-site. Neither the Plan of Development nor the report on Sanitary Sewer System and Sewage Treatment Plant for East Hampton show proposed public sewerage of any portion of the site. Analysis of the soils indicates that approximately 98.5 percent of the site has severe limitations for on-site waste disposal, principally because of shallow depth to bedrock, stoniness, or wetness. Pockets of suitable soils would have to be located for siting of septic filter fields, and as mentioned earlier in this report in the section on SOILS, this could be an expensive process.

According to the developer, on-site private well water supplies and subsurface sewage disposal systems would have to be developed for approximately 35-40 single-family homes.

More than half of the 170 acres is characterized by shallow to bedrock soils, ledge rock outcrops, slopes greater than 15%, wet soils, or a high ground water condition. Therefore, the topography, when one considers the locations of wells

in relation to subsurface sewage disposal systems and suitable land for septic systems, must be classified difficult and limited.

The locations of wells and septic systems will be irregular in pattern and thereby increase the possibility of well water contamination since some of the wells may be installed downgrade from the subsurface sewage disposal systems. Another factor that must be considered is that shallow bedrock underlying the soil has fractures and fissures. Therefore, the possibility exists that the septic effluent from the sewage leaching field might reach these channels and flow quickly into the ground water strata and contaminate the well water aquifer if the effluent is not filtered by percolating through at least four feet of suitable soil.

As previously stated, the ledge rock, high ground water, and slope conditions place definite limitations on the on-site subsurface sewage disposal systems since suitable land must be available for the operation of leaching fields, as defined and outlined in the Public Health Code of the State of Connecticut, Sec. 19-13-B20a.

The developer of the subdivision should acquire the services of a professional engineer in order to determine the amount and location of suitable land to successfully locate sewage disposal systems that will not pollute the individual wells or the Cattle Lot Brook wetland. The final subdivision plan must be submitted for further evaluation and each lot must be individually approved by the Department of Health in accordance to the Public Health Code in Sections 19-13-B51.

ROADS AND UTILITIES

Development done prior to the Team review (roadwork, clearing of lots, re-direction of small tributaries of Cattle Lot Brook) has been done in neither the environment's nor the developer's best interests. Poor planning to this point of the proposed subdivision should be altered to better conform to the natural condition of this area. Much of the stream diversion work done appears unnecessary. Streams should be bridged rather than moved.

With severe limitations over 98% of the site, possible home siting should be such to keep road and utility construction at a minimum. Bear Swamp Road is shown as a proposed collector in the 1968 East Hampton Plan of Development. This existing Town road lacks proper erosion control devices, and will need to be widened to support increased traffic due to subdivision development. An extensive drainage system will be necessary to minimize runoff into Bear Swamp and Cattle Lot Brook. Any additional development of existing or proposed transportation systems (roads or driveways) if not adequately protected with erosion control devices would create a hazard to the stability of the environment, especially the Cattle Lot Brook watershed. Private access roads or driveways into the subdivision will be difficult to place as a result of the steepness of slope and rockiness of the area proposed to be subdivided. Driveway bridges should be used to span the major tributary stream of Cattle Lot Brook which had been planned for channelization.

AESTHETICS AND PRESERVATION

Given the severe limitations of the soils and terrain for foundation development and septic fields, discretion should be exercised in home siting so as to minimize disruption to the ecological system. Special attention should be given to safeguarding the streambelts of Cattle Lot Brook and its feeder streams and adjoining wetlands. Cattle Lot is shown as a proposed greenbelt in the 1968 East Hampton Plan of Development.

SERVICES TO SUPPORT DEVELOPMENT

As access to the site is provided only by an unimproved town road, either the developer or the Town of East Hampton will have to upgrade the road to Town specifications so that necessary Town services could be provided to any dwellings which might be constructed on the site.

COMPATIBILITY OF SURROUNDING LAND USES

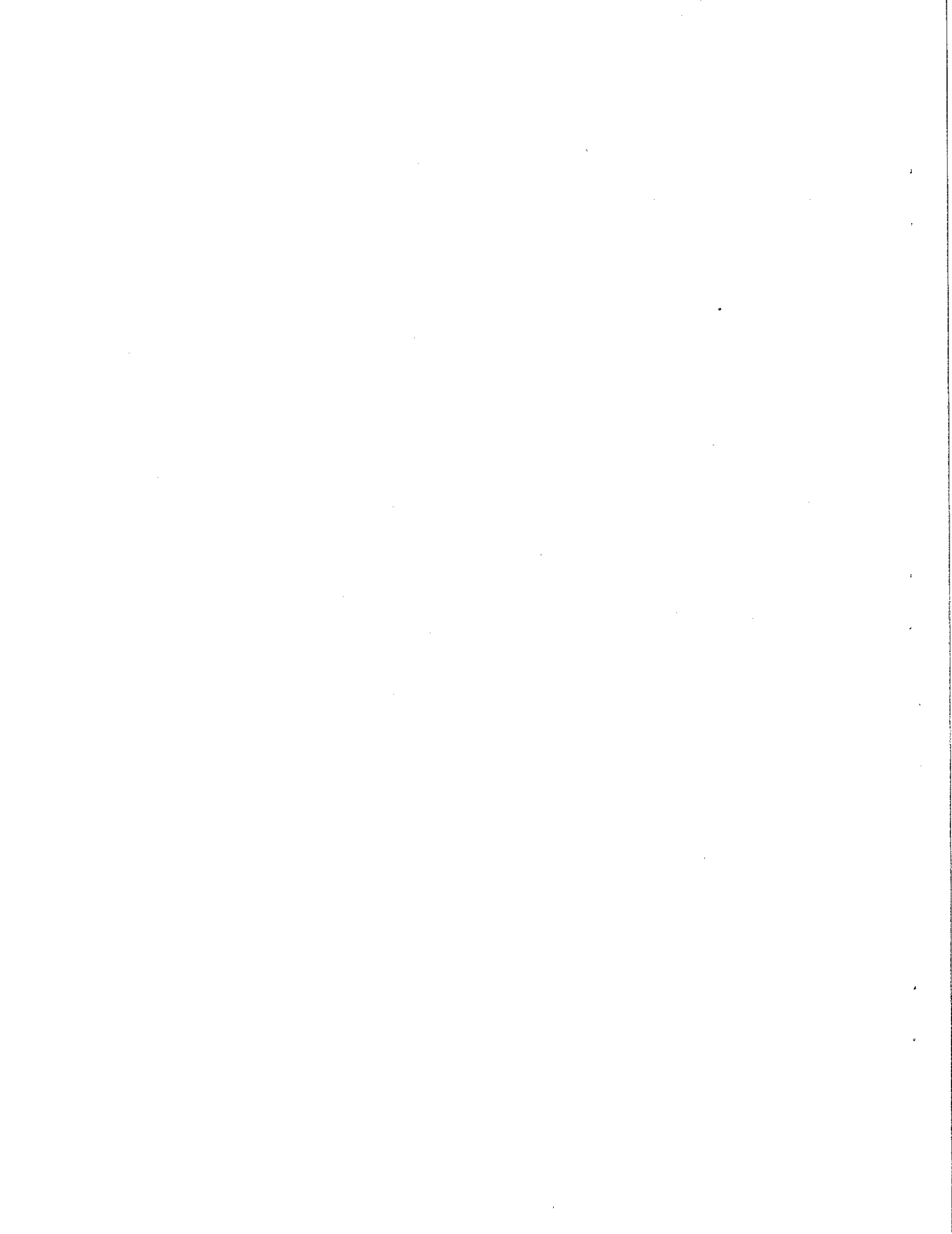
The site lies entirely within the rural RU-2 zone of East Hampton which, without public sewerage, requires a minimum lot size of 60,000 square feet per dwelling unit. East Hampton lands abutting the site are also zoned RU-2 and are vacant, except that the site abuts a small area of State Forest in the southeastern portion of the site.

Land abutting the site in the Town of Marlborough is zoned Rural Residential with a three acre minimum lot size, with provisions for lot area reduction to one and one-fourth acre subject to soil suitability and approval by the Zoning Commission. For the most part these lands are also vacant.

Limited residential development of the site is compatible with surrounding lands and is proposed for a narrow strip on either side of Bear Swamp Road in the 1968 East Hampton Plan of Development.

ALTERNATIVE LAND USES FOR AREA

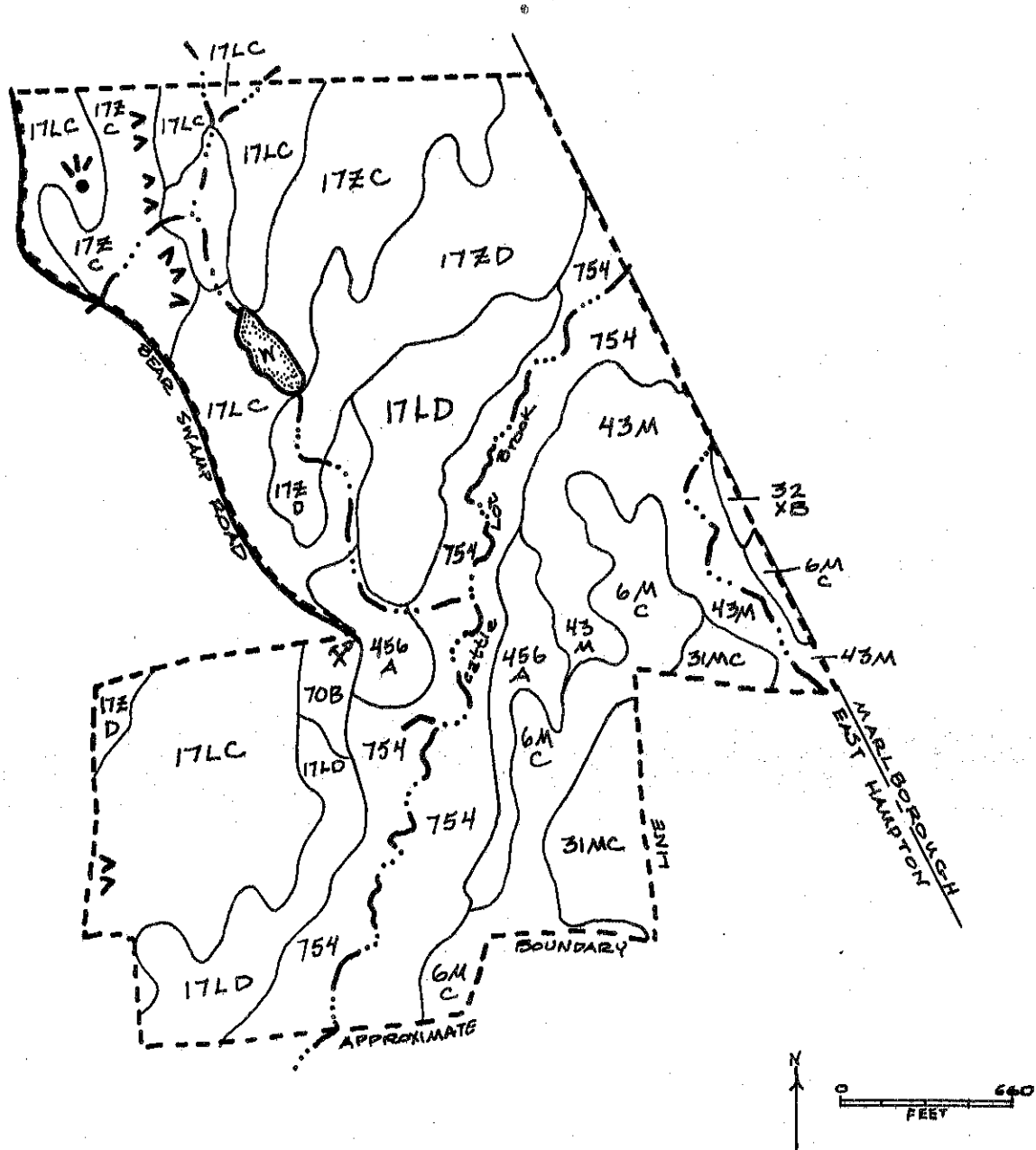
Other than leaving the land in its natural state due to the severe site limitations discussed throughout this report, the site is best used for limited residential development provided the site limitations are respected.



APPENDIX

SOIL MAP

BEAR SWAMP ROAD SUBDIVISION
EAST HAMPTON, CONNECTICUT



The map is an enlargement from the original 1,320'/inch scale to 660'/inch.

Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE, Soil Conservation Service.

Advance Copy, Subject To Change.

April 1976

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
					On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
Canton & Charlton	6MC	16	9	Stony	3	3	3	3
Hollis-Charlton	17LC	40	22.5	Depth to bedrock	3	3	3	3
Hollis-Charlton	17LD	19.5	11	"	3	3	3	3
Hollis-Rock outcrop	17ZC	21	12	"	3	3	3	3
Hollis-Rock outcrop	17ZD	18	10	"	3	3	3	3
Woodbridge	31MC	8	5	Wet, stony	3	3	3	3
Charlton	32XB	1.5	1	Stony	2	2	1	2
	43M	13	7	Wet	3	3	3	3
Merrimac	70B	1	.5	Very rapid permeability in the sub-stratum	1	1	1	2
Sudbury	456A	9	5	Wet	3	3	2	1
Scarboro	754	30.5	17	Wet	3	3	3	3
TOTAL		<u>177.5</u>	<u>100%</u>					

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.