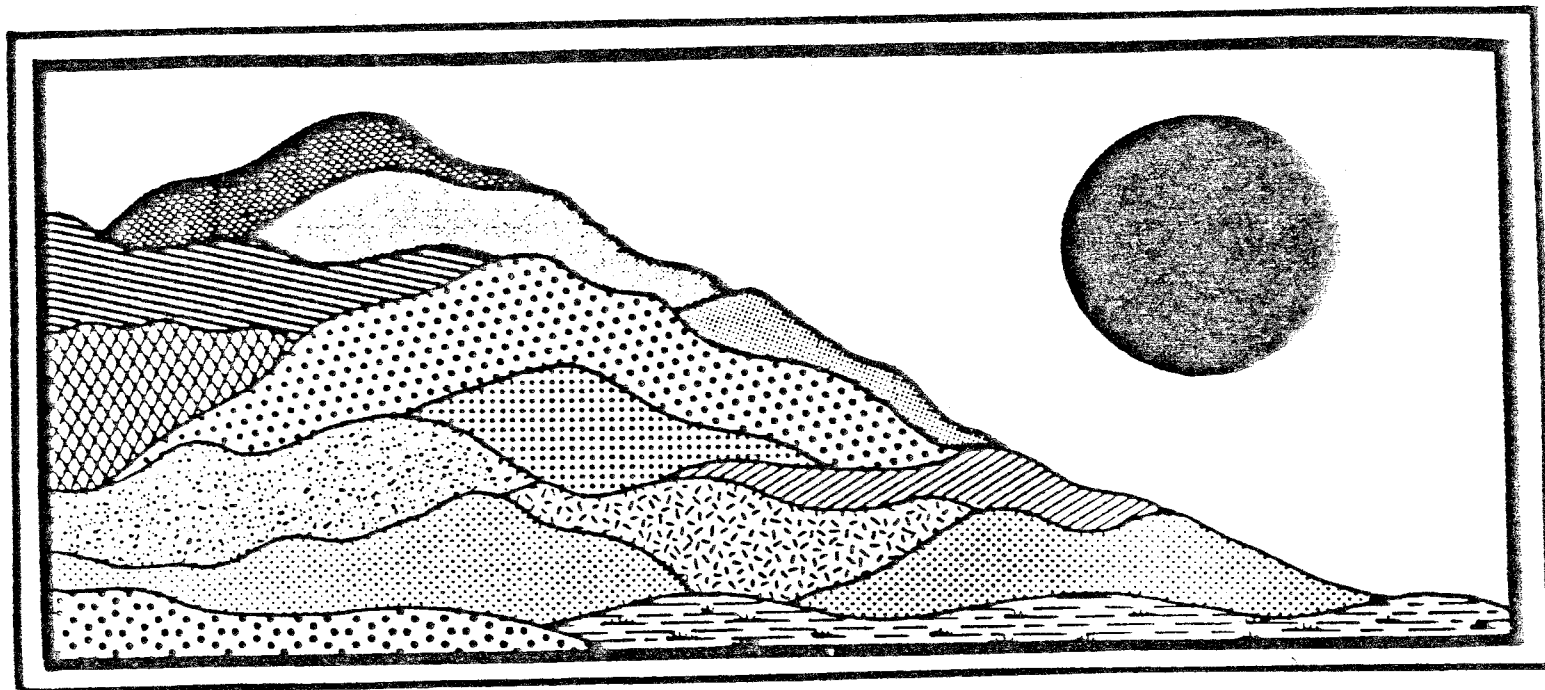


# Lech Property

Old Lyme, Connecticut

November 1986



ENVIRONMENTAL

REVIEW TEAM

REPORT

# Lech Property

Old Lyme, Connecticut

Review Date: OCTOBER 6, 1986

Report Date: NOVEMBER 1986



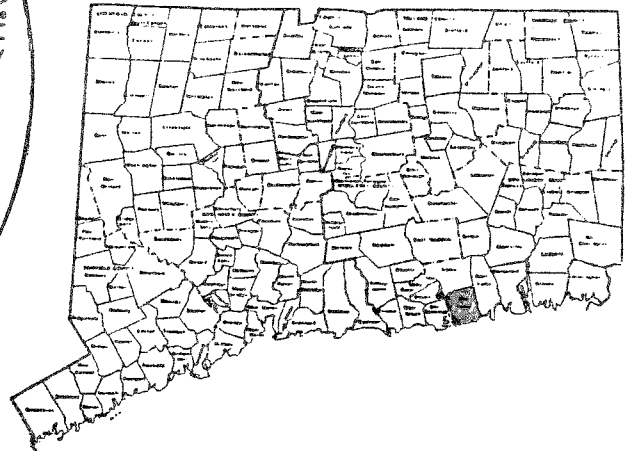
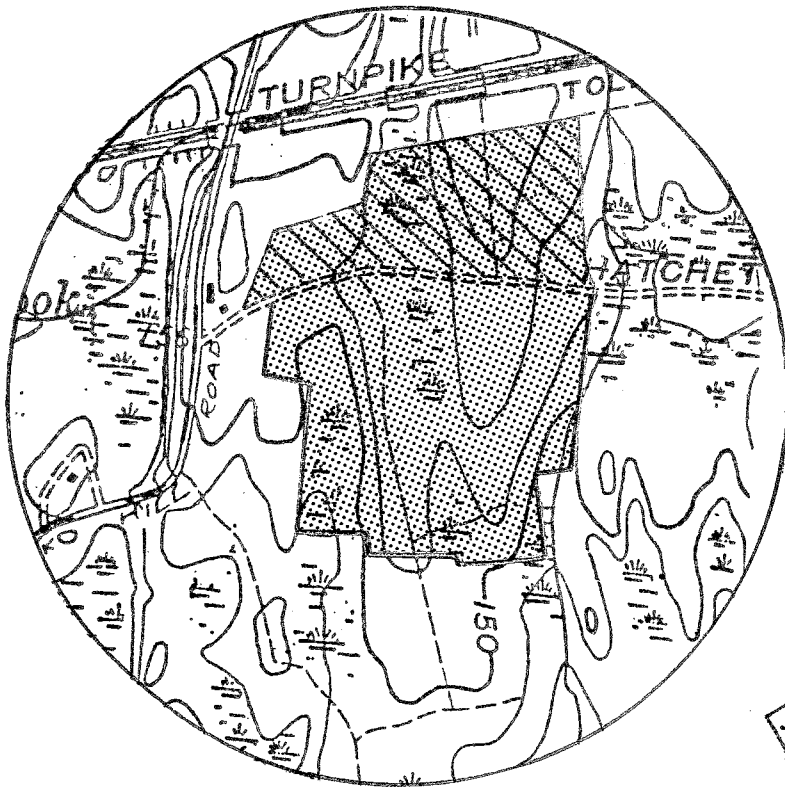
ENVIRONMENTAL REVIEW TEAM

PO BOX 198

BROOKLYN, CONNECTICUT 06234

# Site Location

LECH PROPERTY SUBDIVISION  
 HATCHETT HILL ROAD (NORTH & SOUTH)  
 OLD LYME, CONNECTICUT



EASTERN CONNECTICUT  
 RESOURCE CONSERVATION  
 & DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT

ON

THE LECH PROPERTY SUBDIVISION

Old Lyme, Connecticut

This report is an outgrowth of a request from the Old Lyme Conservation Commission to the New London County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on Monday, October 6, 1986. Team members participating on this review included:

Don Capellaro	--Sanitarian - Connecticut Department of Health
Barry Cavanna	--District Conservationist - U.S.D.A., Soil Conservation Service
Richard Serra	--Regional Planner - Connecticut River Estuary Regional Planning Agency
Elaine Sych	---ERT Coordinator - Eastern Connecticut RC&D Area
Bill Warzecha	--Geologist - DEP, Natural Resources Center

Prior to the review day, each Team member received a summary of the proposed project, a list of the Town's concerns, location maps, an index plan and a soils map. During the field review the Team members were given subdivision plans. The Team met with, and were accompanied by the property owner and his engineer. Following the review, reports from each Team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project -- all final decisions and conclusions rest with the Town and landowner. 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. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Executive Committee hopes you will find this report of value and assistance in making your decision on the proposed subdivision.

If you require any additional information, please contact:

Elaine A. Sych  
ERT Coordinator  
Eastern Connecticut RC&D Area  
P. O. Box 198  
Brooklyn, CT 06234  
(203) 774-1253

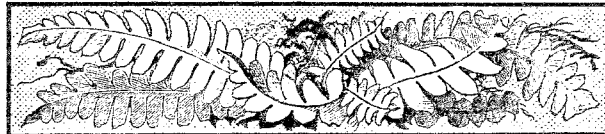


TABLE OF CONTENTS

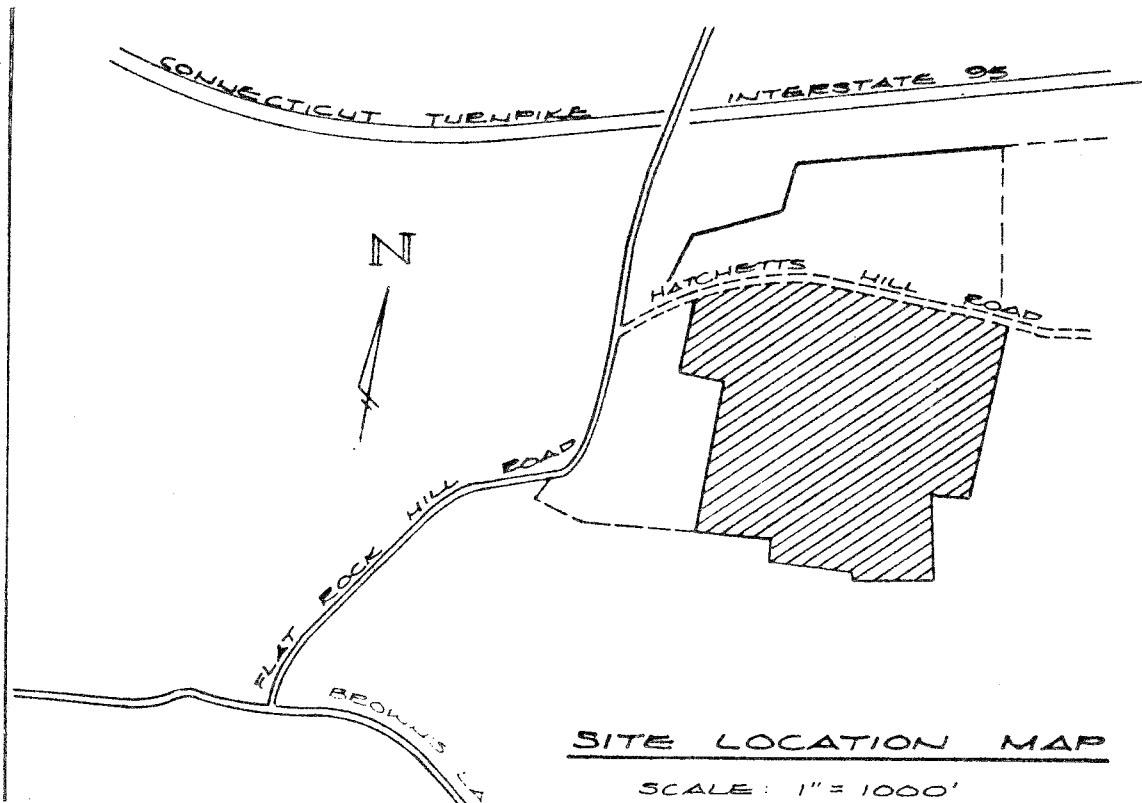
	<u>PAGE</u>
A. INTRODUCTION.....	3
B. PHYSICAL AND TOPOGRAPHICAL SETTING.....	6
C. GEOLOGY.....	8
D. HYDROLOGY.....	11
E. SOILS AND EROSION AND SEDIMENT CONTROL.....	13
F. SEWAGE DISPOSAL.....	15
G. WATER SUPPLY.....	16
H. PLANNING REVIEW.....	17
I. SUMMARY.....	18

TABLE OF MAPS

SITE LOCATION.....	2
INDEX PLAN.....	4
TOPOGRAPHY.....	5
BEDROCK GEOLOGY.....	7
SURFICIAL GEOLOGY.....	9
HYDROLOGY.....	12
SOILS.....	14



SITE LOCATION MAP SCALE 1"=1000'



SITE LOCATION MAP

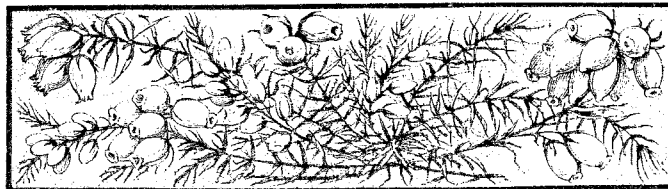
SCALE: 1" = 1000'

A. INTRODUCTION

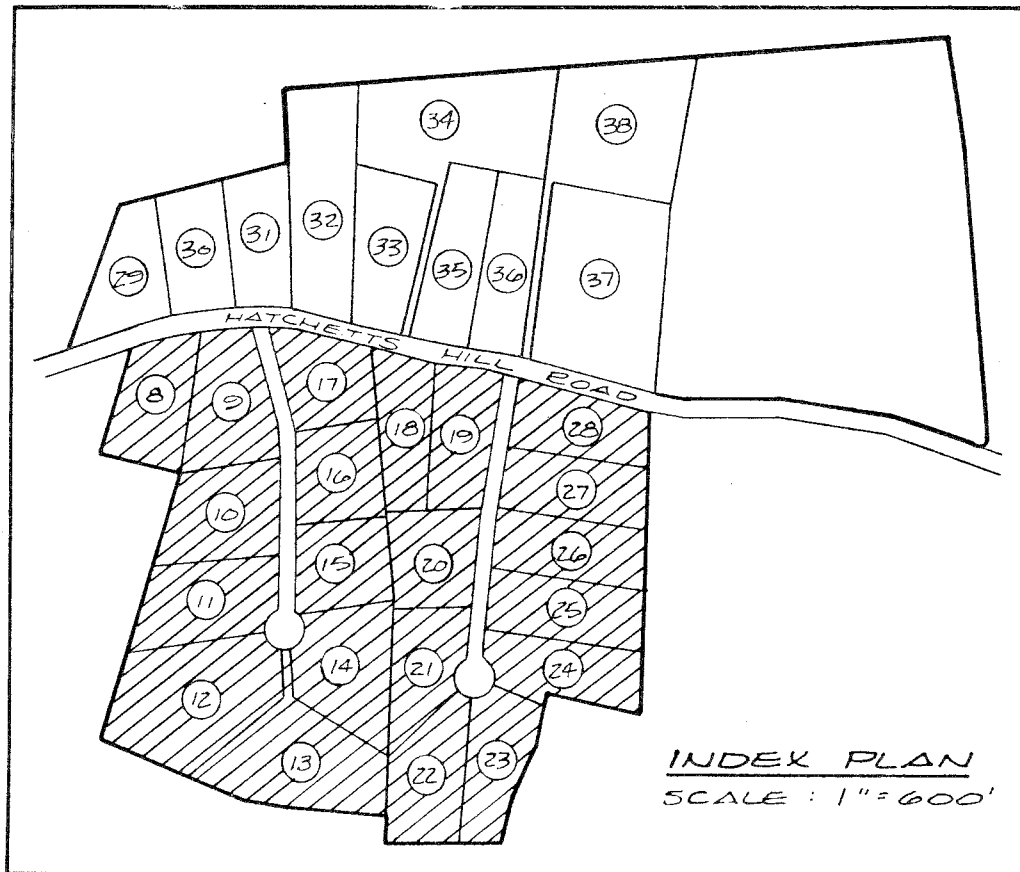
The Eastern Connecticut Environmental Review Team was asked to perform an environmental review and evaluation of the proposed Lech Property Subdivision by the Old Lyme Conservation Commission.

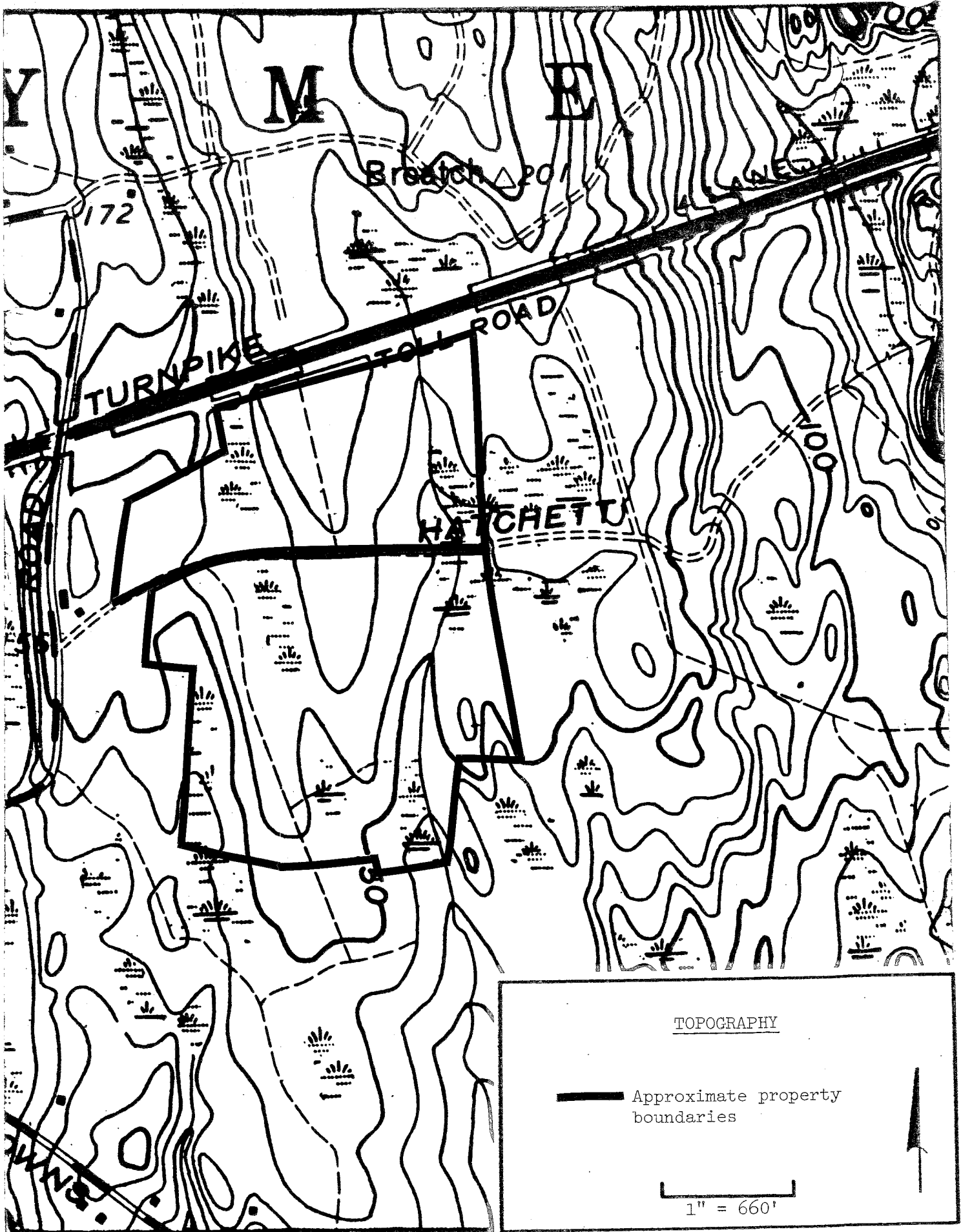
The parcel, which is located on both sides of Hatchett Hill Road east of Flat Rock Hill Road, consists of approximately 101 acres of wooded terrain. The major portion of the property is relatively level with slight slopes towards both east and west sides. The northern part terminates close to the Connecticut Turnpike. The area is distinguished by two (2) watercourses (Armstrong Brook and the other with no name) and associated wetlands towards the sides of the property running in a north/south direction.

The developer's engineering firm (Angus McDonald/Gary Sharpe & Associates) has laid out a tentative subdivision plan for thirty-one (31) lots of two (2) acres (80,000 square feet) or larger. Ten (10) of the lots would be on the north side of Hatchett Hill Road with the remaining ones (21) being on the south side of the road. All of the lots on the north side would have access to Hatchett Hill Road, although two (2) would be rear lots. On the south side two (2) relatively short and parallel roads with cul-de-sacs would be constructed.







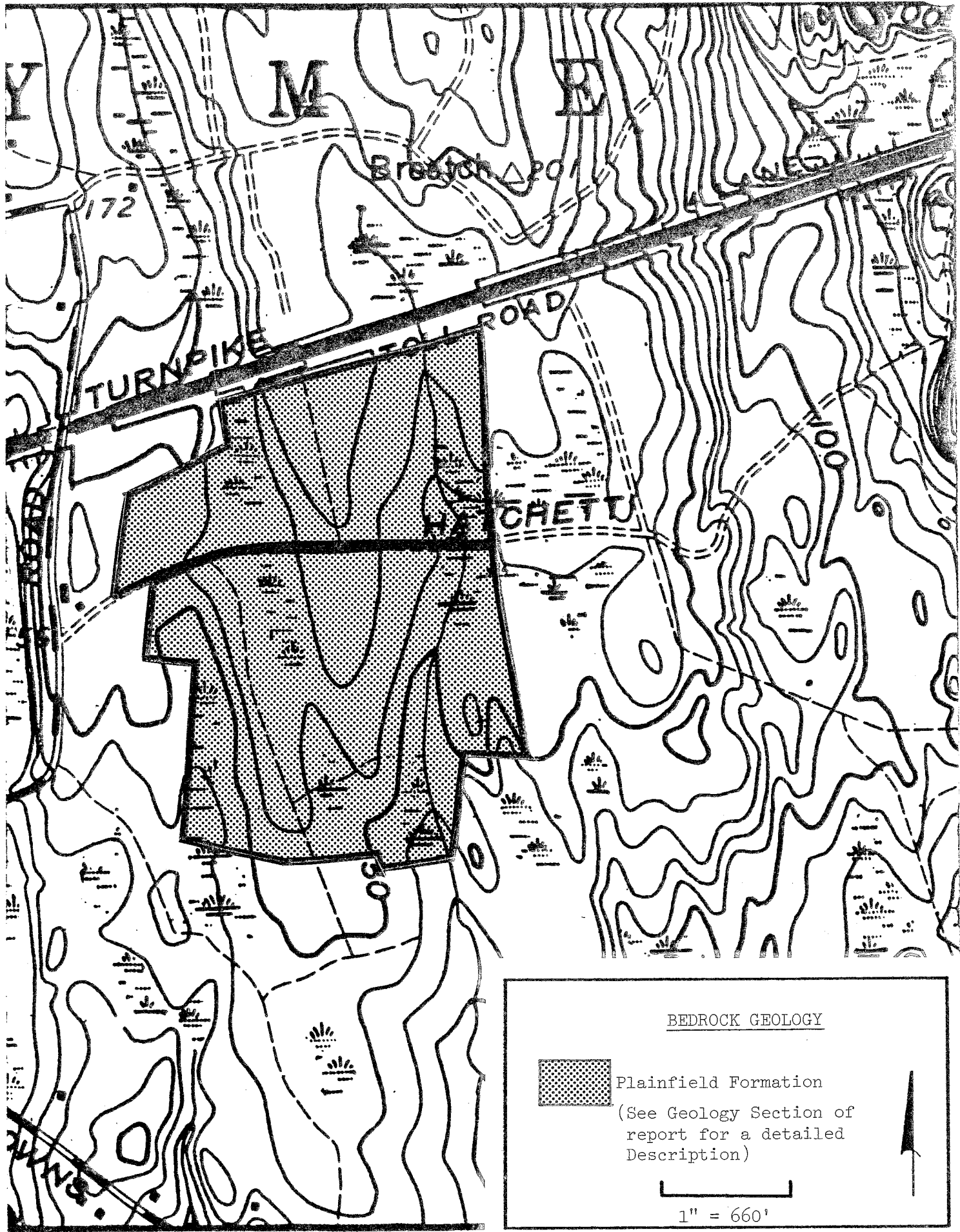


B. PHYSICAL AND TOPOGRAPHIC SETTING

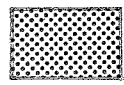
The proposed Lech Property subdivision (north and south) consists of about 101 acres of wooded land in the central part of Old Lyme. Hatchett Hill Road, an existing gravel base town road, bisects the property and separates the northern parcel from the southern parcel. One major streamcourse, Armstrong Brook flows in a southerly direction through the eastern parts of the property. A seasonally wet drainageway flows in a southerly direction in the western parts of the site. The applicant wishes to subdivide the land into thirty-one (31) house lots which would be served by individual on-site wells and septic systems.

The parcel is located in a low-lying topographic saddle which is characterized by fairly gentle slopes. Maximum and minimum elevations on the parcel are about 180 and 190 feet above mean seal level, respectively.





BEDROCK GEOLOGY



Plainfield Formation  
(See Geology Section of  
report for a detailed  
Description)



1" = 660'



### C. GEOLOGY

The site lies entirely within the Old Lyme topographic quadrangle. A bedrock geologic map (map QR-21, by L. L. Lundgren) and a surficial geologic map (QR-31, by R. F. Flint) for the quadrangle have been published by the Connecticut Geologic and Natural History Survey.

Bedrock or ledge outcroppings were not observed during the field review. According to deep test pit information supplied by the developer's engineer, the shallowest bedrock surface on the site was encountered in test pits located on Lot 29. Depth to bedrock on this lot ranged between 3.5 feet and about 5 feet below ground surface. On-site test hole work has demonstrated that the depth to bedrock on the remainder of the site is 6.5 feet or more.

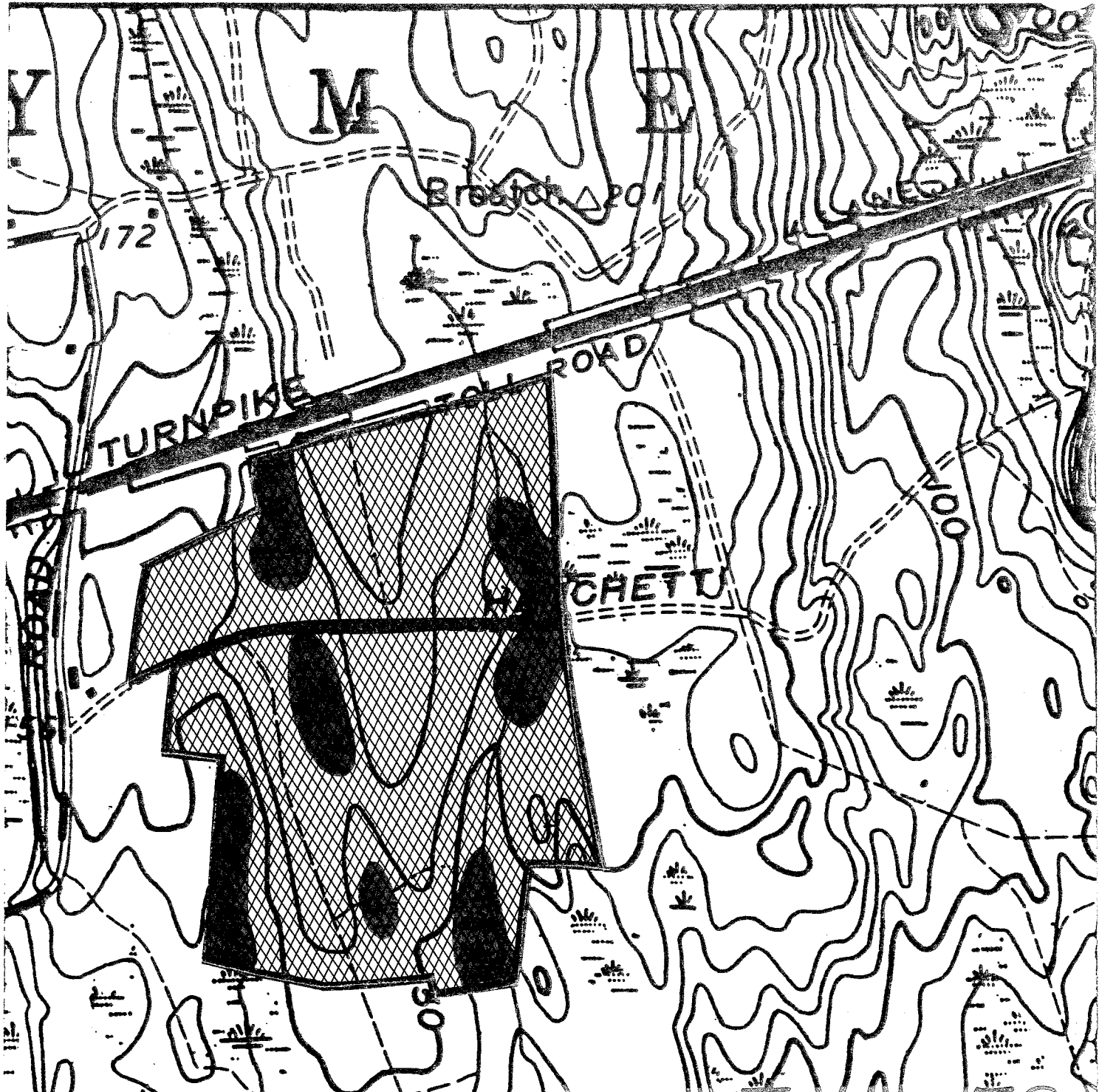
The rock core of the site is well described by Lundgren in map QR-21. The rock is described as a subunit of the Plainfield Formation. It consists of gray gneiss composed of the minerals biotite, quartz and feldspar which contains many layers of schists and amphibolite. This rock is also extensively dissected by granitic rocks which contain large biotite crystals. Gneisses, schists and amphibolite are textural names given to metamorphic rocks; rocks geologically altered by great heat and pressure within the earth's crust. The "granitic" rocks, which consist of a high percentage of light-colored minerals such as quartz and feldspar intruded the gneiss, schist and amphibolite layers as molten material during tectonic periods millions of years ago.

The bedrock structure, as well as glaciation, which took place in Connecticut 10,000-12,000 years ago, has influenced the shape of the landforms and the drainage pattern on the site.

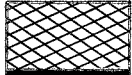

It should be pointed out that the water supply for each lot of the proposed subdivision would be derived from drilled wells that tap the underlying bedrock. As a result, it will have an affect on the potential yields and water quality of the wells. (See Water Supply section.)

A relatively thin blanket, probably ten (10) feet or less of glacial sediment known as till, covers the bedrock on this parcel. The till, consisting of a non-sorted, non-stratified mixture of rock particles of widely varying shapes and sizes, was deposited directly from glacier ice without substantial re-working by meltwater.


Glacier ice in the State moved across the region, generally from north to southeast. Where the till is less than five (5) feet thick, it is commonly sandy, very stony and loose. Where the till is more than five (5) feet thick, the upper few feet are commonly sandy (as previously described); the lower portion of the deposit, however, is often siltier and tightly compact. According to soil mapping information, the latter variety of till covers most of the parcel. As mentioned earlier, shallow till only appears to be dominant on Lot 29.



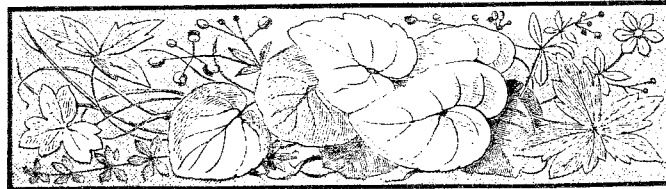
SURFICIAL GEOLOGY

	Till
	Swamp Sediments (Approximate)

1" = 660'



According to soils information supplied to Team members by the applicant's soil scientist and the surficial geologic map, the south-flowing drainage channels on the site are paralleled by relatively thin bands of regulated inland wetland soils. A few of these wetland areas terminate on the site as they encounter more permeable soils and they occupy topographic depressions in a few places.



#### D. HYDROLOGY

Surface runoff and probably groundwater within the parcels (north and south) can be divided nearly in half. The eastern half of the parcels lie within the Armstrong Brook watershed. Armstrong Brook flows through the eastern limits of the parcels in a southerly direction enroute to Long Island Sound. At its intersection with Mile Creek Road, it is estimated that Armstrong Brook drains an area of about 301 acres. Total drainage area for Armstrong Brook, at the mouth near South Lyme, is about .75 square miles or 480 acres. Except for some large lot residential dwellings just north of Mile Creek Road, the watershed to the point of outflow mentioned above, is relatively undeveloped. I-95 traverses the northern limits of the watershed in a east-west direction.

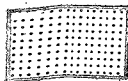
The western half of the parcels lies within the Swan Brook watershed. The wetland area in the western parts of the northern half forms the headwaters for Swan Brook. Swan Brook flows generally southward enroute to Long Island Sound. It drains a total area of about 560 acres (see watershed boundary map). This watershed is characterized by medium density residential development in the central parts, but land has been intensely developed in the southern parts. The latter consists mainly of summer homes at Sound View.

The subdivision of the property as planned, followed by the construction of new homes, driveways and cul-de-sacs would be expected to lead to some increases in runoff from the site. As mentioned earlier, increased runoff generated from the proposed subdivision would be divided into two (2) watersheds. This will help to lessen the effects of post-development runoff on any one watershed. Because the density of development is relatively low (about 15 homes plus roads) for each watershed, it is expected that any peak flow increases would be small. In addition, wetland areas on the site and downstream will serve as natural runoff control basins. Under these circumstances, it seems likely that on-site runoff detention will not be necessary. Nevertheless, as a matter of policy, the applicant's engineer should supply the Town with a stormwater management plan which includes hydrologic calculations. Close examination of downstream culverts, especially at Brown's Lane, Mile Creek Road and at Sound View is warranted. If flooding problems exist at any points downstream, even a minor increase in runoff from a potential development could further aggravate an existing situation.

Besides flooding problems, increased runoff can lead to additional water-related problems such as streambank erosion and gullyng. In view of the generally flat slopes present in both watershed, it does not appear that erosion problems should be a major problem, especially if a comprehensive erosion and sediment control plan is developed covering each stage of the proposed subdivision. It should be pointed out that on July 1, 1985 the Connecticut Soil Erosion and Sediment Control Act (P.A. Number 83-388) became fully effective. As a result, a detailed erosion sediment control will be required for the project and should be properly enforced by the Town. Disturbed areas should be kept to a minimum under such a plan. The erosion and sediment control measures called for under the plan should be shown on the subdivision plan.



WATERSHED BOUNDARY



Study Site



Watercourses showing direction of flow



Design Points



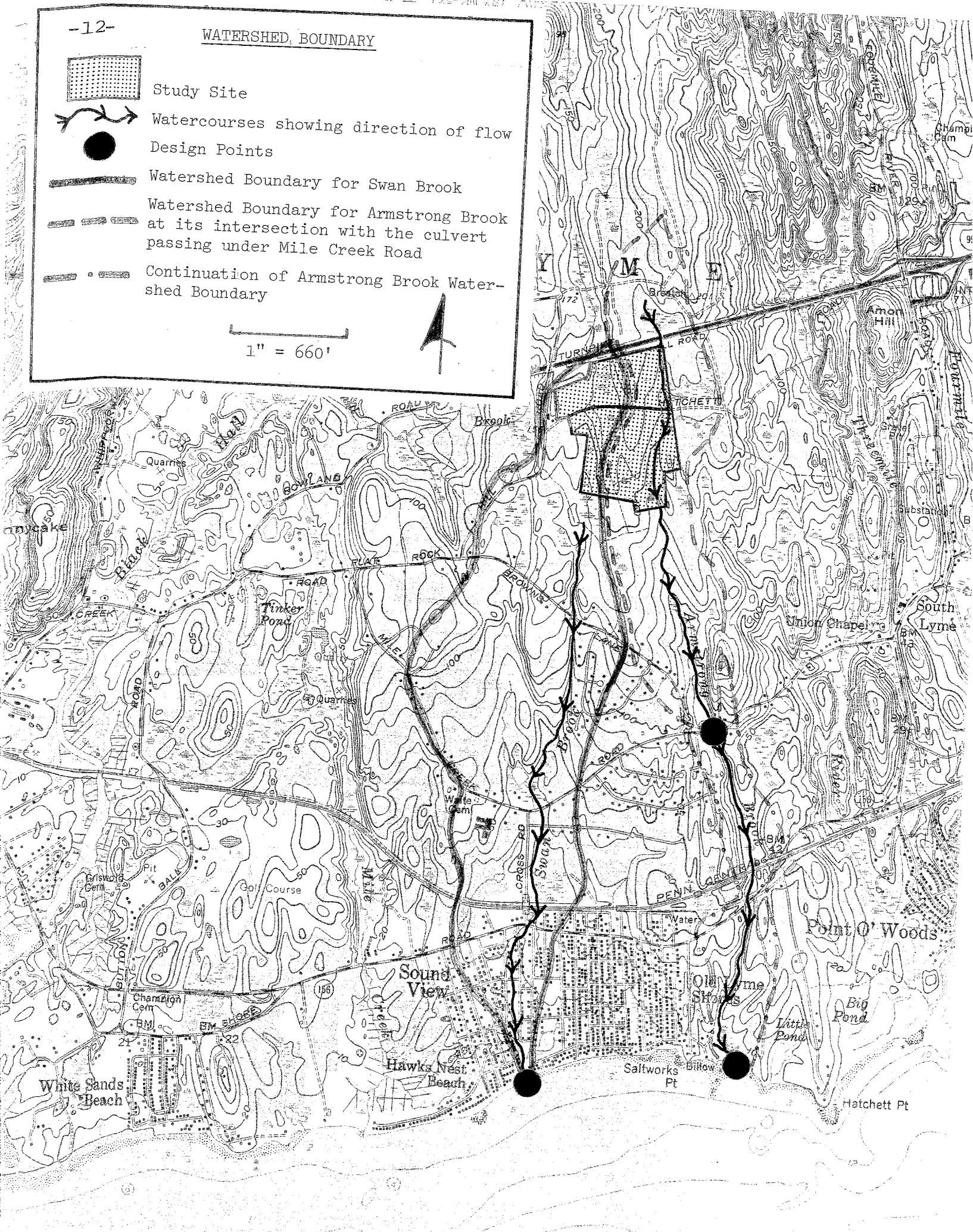
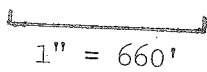
Watershed Boundary for Swan Brook



Watershed Boundary for Armstrong Brook at its intersection with the culvert passing under Mile Creek Road



Continuation of Armstrong Brook Watershed Boundary

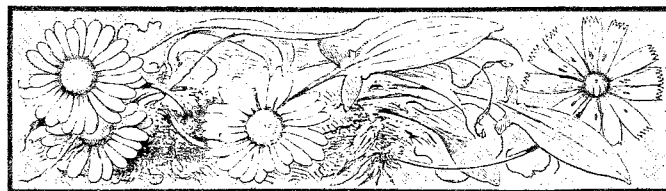


E. SOILS AND EROSION AND SEDIMENT CONTROL

The soils information contained in the New London County Soil Survey is adequate for this proposal.

Due to the relatively flat topography, the Sediment and Erosion Control Plan appears adequate.

It should be noted that it will be difficult to construct homes with basements on Lots 17--21, due to the groundwater level and lack of suitable outlets for curtain drains.





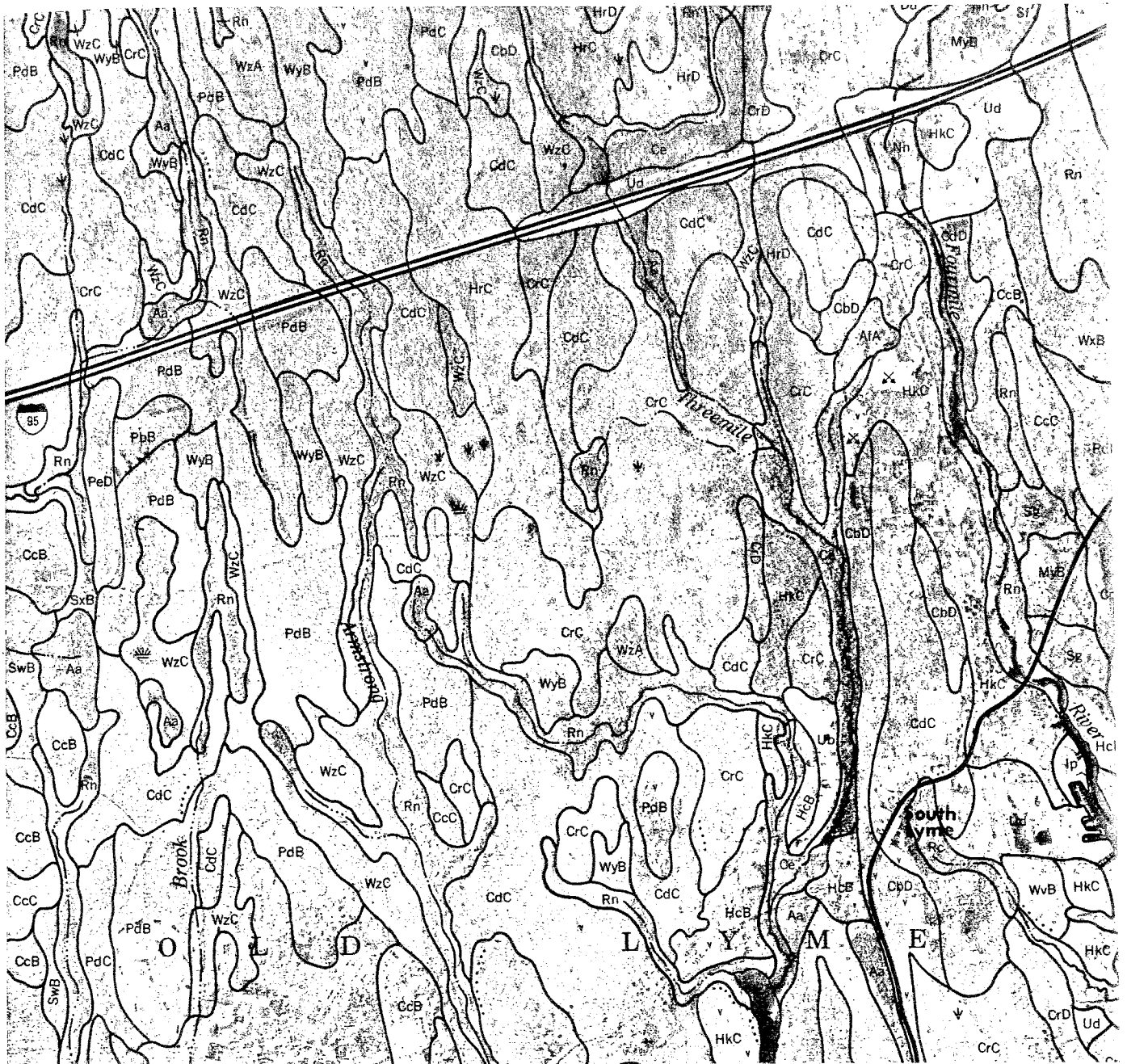
United States  
Department of  
Agriculture

Soil  
Conservation  
Service

New London County  
562 New London Turnpike  
Norwich, CT 06360  
887-4163

Soil Survey Sheet #86

Scale 1" = 1320'



## F. SEWAGE DISPOSAL

Based on visual observations, deep test hole information provided by the project engineer and available bedrock and soil mapping, the major geologic limitations which may pose constraints with respect to the proposed subdivision include:

- 1) the shallow to bedrock areas on Lots 20 and 29.
- 2) the presence of till-based soils throughout the site, which have moderately slow to slow percolation rates and seasonally high water tables. Soil mottles were noted on most of the deep test holes excavated on the site. The mottles were observed generally at or just above the compact soil zone. It seems likely that these mottles occur as a result of a seasonally high water table which is perched over the relatively slow permeable compact soil zone.
- 3) the presence of several bands of inland-wetland soils.

Based on soil service mapping data, soils on this property are generally subject to a seasonal high water condition due to the slowly or very slowly permeable underlying soil layer which restricts vertical drainage. The parcel is relatively flat which also hinders the lateral movement of water through the soil. Because of these factors and the considerable area of wetlands, it is essential that various proposed lots be carefully identified and have adequate soil testing in order to identify suitable areas for subsurface leaching purposes. No doubt sewage disposal systems in this area would have to be kept shallow or relatively shallow in order to keep the bottom area of leach facilities at least eighteen (18) inches above maximum water level. It would also seem necessary on many or some areas to elevate the leaching systems partially or entirely in fill. Curtain and/or combination footing/curtain drains, if properly located in respect to a leaching area, should also prove helpful in controlling groundwater provided individual sites have a satisfactory point to discharge to. Also, in most soils where there is a restrictive, less permeable, underlying layer, leaching systems should be made relatively large and spread out along the contour to further the lateral disposal of effluent into the naturally occurring soil.

As it seems most or all of the property constitutes an area of special concern, engineered plans for sewage disposal systems should be required before individual sewage and building permits are issued.

It should not necessarily be assumed that a suitable area for both primary and reserve leaching systems will be available just on the basis of large lot size and limited testing. Potential useable area minus any significant adverse topographical features, along with adequate soil testing within an actual useable area should be taken into consideration. A number of adverse conditions or very limited potential useable area may indicate the need for lot sizes larger than normally required by minimum regulations.

## G. WATER SUPPLY

The Town of Old Lyme, through the local health department, has a regulation which requires the well to be developed first on any designated building lot before proceeding with general house construction. This is to ensure the lot has a water source with an adequate yield for the intended purpose.

Each lot in the proposed subdivision will be served by an individual on-site water supply well. The water will be derived from drilled wells which tap the underlying metamorphic bedrock. A well drilled no more than 200 feet into the underlying bedrock should be capable of yielding a few gallons of water per minute (gpm), but there is at least a slight chance that drilling in any particular location will result in a very low yield (i.e., less than a one (1) gpm) or a very high yield (i.e., greater than ten (10) gpm). A yield of two (2) to three (3) gpm is usually sufficient for residential demands.

In order to ensure that water quality throughout the parcel and off-site is adequately protected, all wells will need to be installed in accordance with all applicable Town regulations, the Public Health Code, and the State Well Drilling Board. The Town Sanitarian will need to inspect all well locations before the wells are drilled. Also, all wells will need to be properly cased into the underlying bedrock.

The natural water quality should be generally adequate, but because of the particular mineralogy of the bedrock underlying the parcel, there is a chance that the water will have elevated concentrations of iron or manganese, which will discolor the water and cause a metallic taste. Depending upon the ultimate concentrations of these minerals, there may be a need for filtration devices.

An area of concern arises when a number of wells are drilled into bedrock in a concentrated area. The concern is that there may be mutual interference between wells during pumping periods. The exact yield of a bedrock-based well is a function of many hydrogeologic factors including the number and size of fractures present in the bedrock. Because the fractures are unevenly spaced throughout the rock, there is no practical way, short of expensive geophysical tests, to assess the potential of any particular site for a satisfactory well. Nevertheless, when a number of wells are drilled in concentrated areas, every effort should be made to separate wells as far apart as possible. Studies have shown that well interference can be minimized by increasing the spacing between wells.

## H. PLANNING REVIEW

The site is zoned rural residential requiring a minimum lot size of 80,000 square feet. Properties surrounding this parcel on the west and south are similarly zoned. Properties to the north and to the east are zoned light industrial. Interstate 95 separates the industrial and residential districts on the north while the proposed open space of the project will assist to buffer the district on the east. Accordingly, the proposal is compatible within the area.

The site contains extensive wetland areas, and while no encroachment is proposed, construction activity in the area and the placement of on-site utilities have the potential to negatively impact the wetlands.

Comprehensive erosion and sedimentation control measures and complete review of proposed septic system design and installation would minimize any potential adverse impacts.



The trip generation from the proposed thirty-one (31) lots will be approximately 288 trips to and from the site per day. This will result in an A.M. peak hour flow of twenty-three (23) trips and a P.M. peak hour flow of thirty-one (31) trips.

The immediate concern, with regard to road network, is the upgrading of Hatchett Hill Road to Town Road standards prior to the introduction of any of this traffic.

The traffic flow from Hatchett Hill Road will be into the Flat Rock, Brown's Lane, Mile Creek Road network. Available traffic count data for this network is limited.

Review of the Brown's Lane/Wychwood Road traffic report conducted by "Hayden-Wegman Consulting Engineers" (1986) and a windshield survey of development in the area, indicates that the additional traffic flow will not substantially impact the present level of service of the network.

## I. SUMMARY

NOTE: This is a brief summary of the major concerns and recommendations of the Team. You are strongly urged to read the entire report, and to refer back to a specific section to obtain all the information about a certain topic.

--It seems likely that on-site detention will not be necessary for post-development runoff, but as a matter of policy, the applicant's engineer should supply the Town with a stormwater management plan which includes hydrologic calculations.

--Downstream culverts should be examined especially at Brown's Lane, Mile Creek Road and Sound View. If flooding exists at any of these points even a minor increase in runoff could further aggravate an existing condition.

--The Erosion and Sediment Plan appears to be adequate.

--It will be difficult to construct homes with basements on Lots 17-21 because of the groundwater level and lack of suitable outlets for curtain drains.

--Engineered plans for sewage disposal systems should be required before individual sewage and building permits are issued.

--A number of adverse conditions or very limited potential useable area may indicate the need for lot sizes larger than normally required by minimum regulations with regard to sewage disposal.

--In order to insure that water quality throughout the parcel and off-site is adequately protected, all wells will need to be installed in accordance with all applicable Town regulations, the Public Health Code, and the State Well Drilling Board.

--The proposed subdivision is compatible with surrounding land use.

--Construction activity has the potential to negatively impact the wetlands so a comprehensive erosion and sediment control plan should minimize potential adverse impacts.

--Hatchett Hill Road should be upgraded to Town Road standards prior to the introduction of the subdivision traffic.

--The additional traffic from the subdivision should not substantially impact the present level of service of Brown's Lane/Wychwood Road.

# About The Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area--an 86 town area.

The Team is available as a public service at no cost to Connecticut towns.

## PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

## REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.