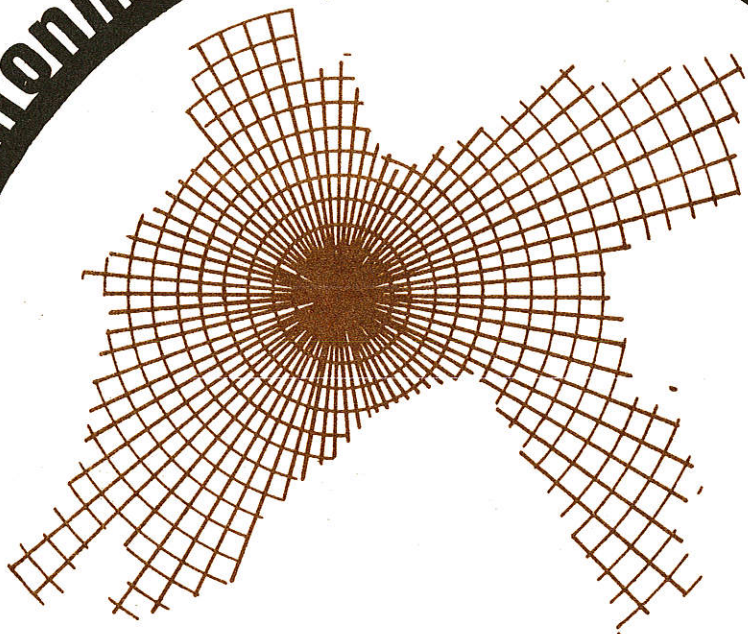
environmental review team report



TIMBERCREEK SUBDIVISION

old lyme, connecticut

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 THE
TIMBERCREEK SUBDIVISION
OLD LYME, CONNECTICUT

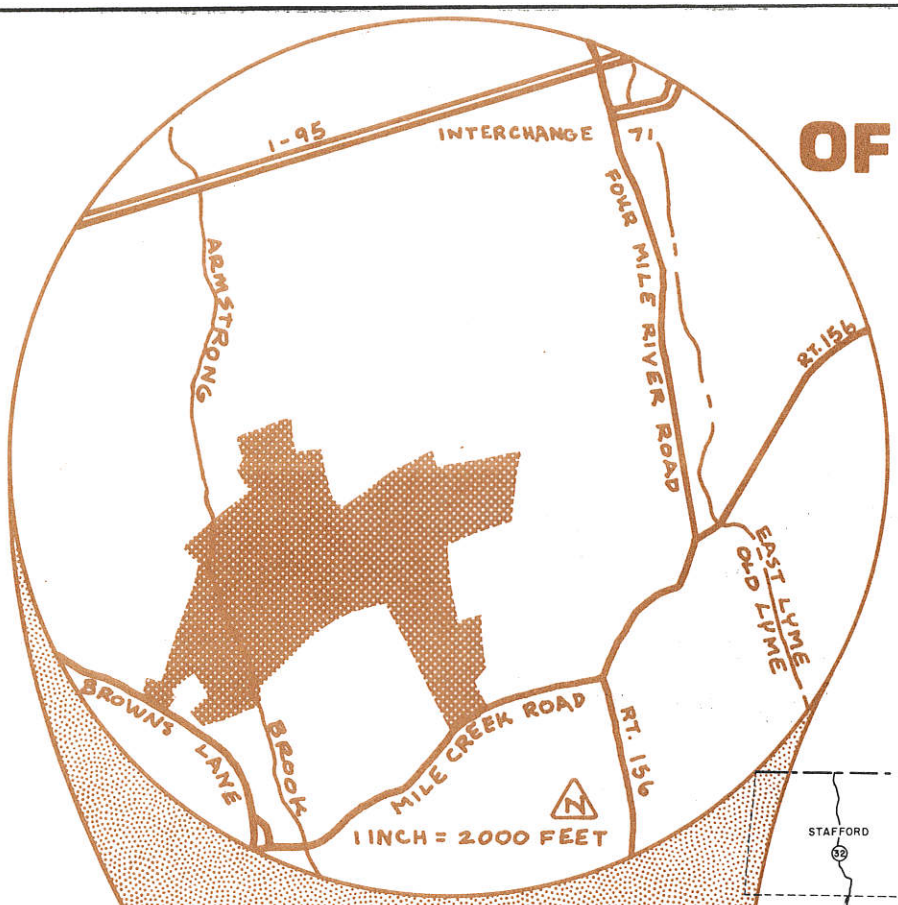
FEBRUARY, 1974

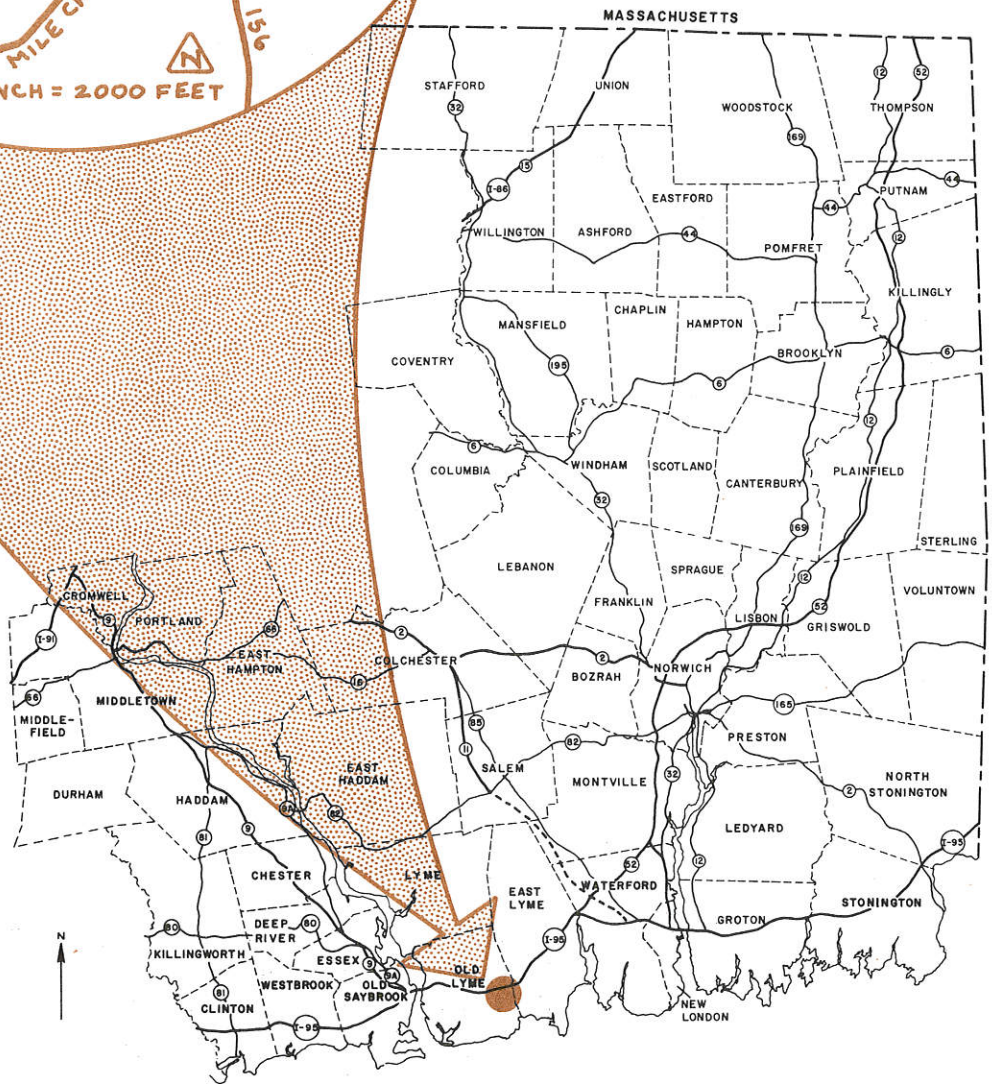
Preparation of this report has been, in part, assisted by a grant from the New England Regional Commission.

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

LOCATION OF STUDY SITE

TIMBERCREEK SUBDIVISION
OLD LYME,
CONNECTICUT





EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
TIMBERCREEK SUBDIVISION
OLD LYME, CONNECTICUT

This report is an outgrowth of a request from the Old Lyme Planning Commission, with the approval of the owner, the A.R.C. Construction Company, 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) Project Committee for their consideration and approval as a project measure. The request has been approved and the measure reviewed by the Environmental Review Team.

The soils of the site were mapped by a soil scientist of the USDA Soil Conservation Service. Reproductions of the soil survey and a table of limitations for urban development were forwarded to all members of the Team prior to their review of the site.

The Team that reviewed the proposed development consisted of the following personnel: Sherman C. Chase, District Conservationist, Soil Conservation Service (SCS); Edwin L. Minnick, Engineering Specialist, SCS; Dan Meade, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); Huber Hurlock, Forester, DEP; T.E. Linkkila, Wildlife Biologist, DEP; Charles L. Phillips, Fishery Biologist, DEP; Donald Capellaro, Principal Sanitarian, State of Connecticut Department of Health; David Miller, Climatologist, Connecticut Cooperative Extension Service; Stanley S. Greimann, Planner, Connecticut River Estuary Regional Planning Agency; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on November 29, 1973. Reports from each Team member were sent to the Team Coordinator for review and summarization.

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 both the Town of Old Lyme and the developer. 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 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 Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

INTRODUCTION

The proposed Timbercreek subdivision is located on Brown's Lane and Mile Creek Road in Old Lyme, approximately 1/2 mile west of the village of South Lyme. The property encompasses about 140 acres of land with varying topography and soil characteristics. Two streams, Armstrong Brook and an unnamed tributary to the Three Mile River, traverse the site. Proposed development of the site consists of 64 single-family homes on 2 to 3 acre lots.

The Environmental Review Team was requested to evaluate the natural resources of this site with respect to the proposed subdivision. For purposes of discussion within this report, the site was divided into four areas, based on soil types: loose upland till soils (34.7 acres), hardpan soils (55.6 acres), rocky soils (8.5 acres), and inland wetlands (40.0 acres). Generally speaking, the loose upland till soils are the most suitable soils for development on the site, though slopes and stoniness will impose some difficulties. The hardpan soils can be developed, but will require special design in some areas of construction to overcome poor drainage. They also exhibit areas of slope and stoniness. The rocky soils comprise only a small portion of the site and are generally shallow to bedrock. The inland wetlands are not suitable for development and should be left undisturbed, if possible.

The following report will present a more detailed description of the geology and soils, followed by a discussion of the various phases of development. Information and suggestions are provided within this report for use by the developer and town in the preparation and review of the development plans and should not be construed as regulatory in nature.

EVALUATION

GEOLOGY AND SOILS

The proposed subdivision is located in the coastal region of the Eastern highlands of Connecticut, about 1 1/2 miles inland of Long Island Sound and 4 to 5 miles east of the Connecticut River. The site is underlain by the Plainfield Formation, a highly variable group of rocks consisting of interlayered gneisses, schists, and to a lesser extent, amphibolites. In general the gneisses are the more resistant to both mechanical and chemical weathering and tend to form topographic high areas. The schists, being less resistant are usually found underlying the valley and low areas.

The overburden in the area is glacial till, a heterogeneous mixture of particle sizes, ranging from clays to boulders. The mineral and chemical composition of this type of deposit usually reflects that of the country rock found in the area. One would expect the till here to be high in quartz, feldspars, micas, and their associated alteration products.

The thickness of overburden varies from place to place within the site but ranges generally from bare outcrop to somewhat more than 10 feet. The ridge areas, in the southeastern and eastern portion of the site, are strongly controlled by bedrock structure. Outcrops are numerous here and the overburden is generally thin. Throughout the remainder of the site bedrock control is not as obvious and there is probably sufficient overburden to accomodate the proposed land use, provided the other natural resource characteristics are also favorable.

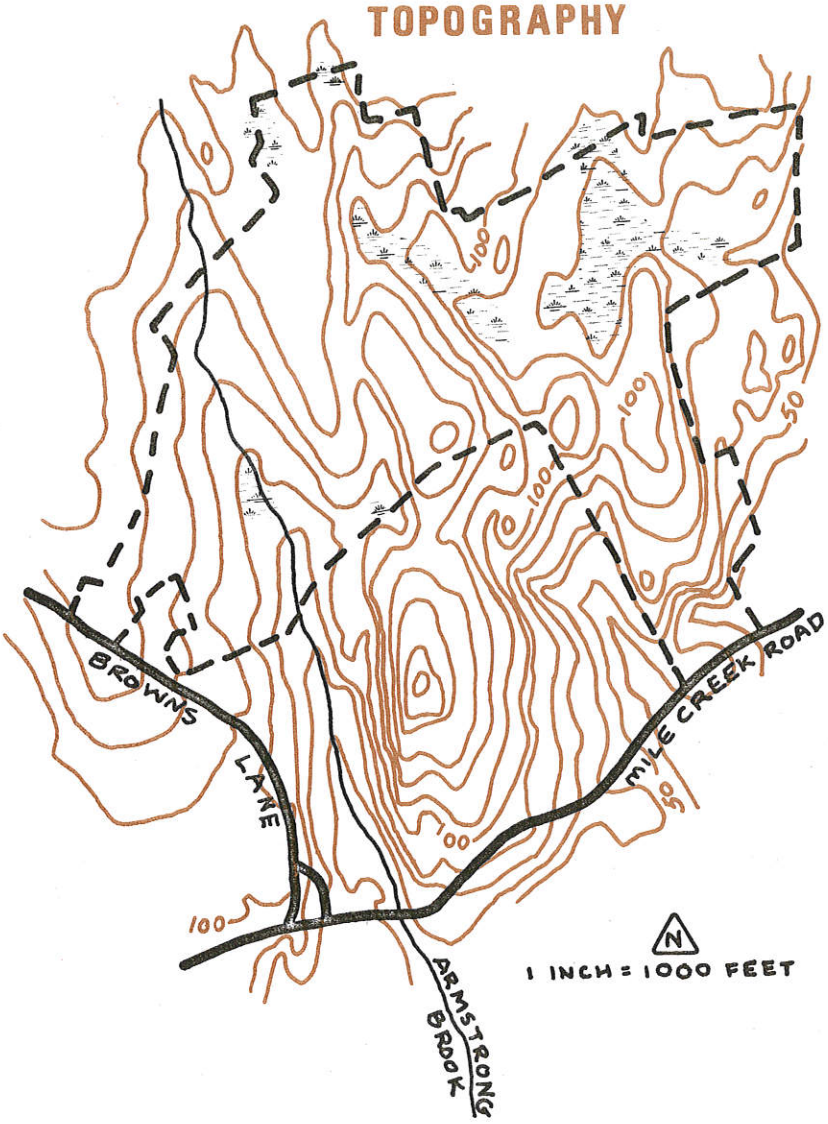
The site is located within two separate drainage systems, those of Armstrong Brook and Three Mile River, with the majority of the site being within the latter. Armstrong Brook traverses the western section of the property and an unnamed tributary of the Three Mile River traverses the eastern section. The contributing drainage area of Armstrong Brook as it leaves the property is approximately 240 acres and that of the unnamed tributary is about 110 acres.

The topography of the area is quite varied ranging from flat, swampy floodplains along the streams to relatively stony slopes in the eastern section approaching Mile Creek Road. The map on the opposite page shows the topography as well as the locations of the streams.

The distribution of soil types on the property also varies greatly. For purposes of discussion, the soils have been combined on the map on page 8 based on their natural soil groups: B-1 & 2, loose upland till soils; B-3, inland wetlands; C-1 & 2, hardpan soils; D-1, rocky soils, shallow to bedrock.

The loose upland till soils comprise 25 percent (34.7 acres) of this site and are the most suitable for development. They were formed in the looser, unconsolidated deposits of till, usually occurring on hillocks and the less steep parts of hillsides. The

TOPOGRAPHY

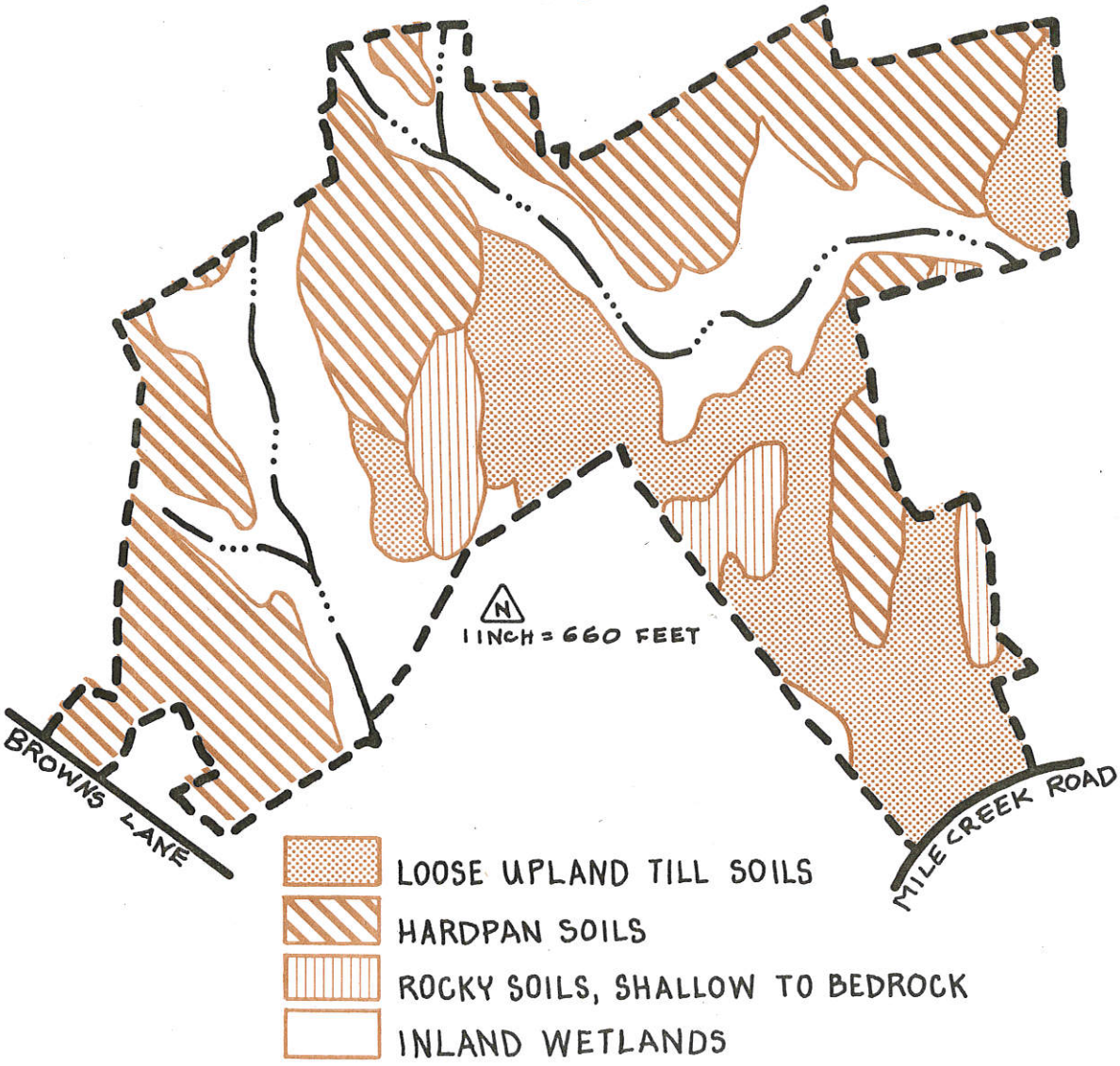


permeability of these soils is generally moderate to rapid. Provisions for steep slopes and stoniness will have to be incorporated into the plans for certain aspects of the development, particularly the sewage disposal systems.

Hardpan soils represent 40.1 percent (55.6 acres) of the site. These soils are underlain by compact glacial till and have a hardpan 16 to 36 inches below the soil surface. The hardpan drastically reduces percolation rates, thus causing a high water table to develop during wet seasons. This area may be used for development if provisions are made to correct the severe limitations caused by the hardpan and steep slopes.

Only a small area, 8.5 acres, falls within the category of

SOILS



rocky soils, shallow to bedrock. Pockets of deeper soils exist within this area and are suitable for development. The rock outcrops may enhance the aesthetic quality for development on the deeper soils, but may also cause higher construction costs, particularly for utilities and roads.

The remaining area consists of 40 acres (28.8 percent of the site) of very poorly drained soils which are classified as inland wetlands under P.A. 155. Water ponds on the surface for significant periods during the winter and spring. These soils present very severe limitations for all aspects of development.

A detailed soil survey and soils limitations chart for the Timbercreek Subdivision is located in the Appendix. It provides

a further breakdown of the soils along with additional information on their characteristics and limitations. Due to the original scale at which the soils are mapped (1" = 1,320') the lines shown on the soils map should not be construed as precise boundaries, but rather as guidelines to the distribution of soil types on the property. The soils limitations chart indicates the probable limitations for each of the soils for on-site sewage, basements, streets and parking lots, and landscaping. However, limitations, even though very severe, do not always preclude the use of the land for development. If economics permit greater expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used.

WATER SUPPLY

Aside from small community systems in the summer colonies along the shore, no central water supply system exists in Old Lyme. Therefore, an on-site supply must be developed for the Timbercreek Subdivision. The developer has expressed a preference for a community type system rather than individual wells on each site.

Most of the existing wells in this area are drilled into bedrock. Yields are relatively good for crystalline rock, ranging between 2 and 33 gpm (gallons per minute) with a median of 13 gpm. A limited number of water quality tests have been performed in this area by the U.S.G.S. which indicate that the water derived from bedrock wells is acceptable. This type of well is commonly utilized because there are fewer natural limitations on location and they are generally reliable during periods of drought.

The primary requirements in a community water supply system are the location of the well(s) in order to protect the water from possible sources of contamination, an adequate yield, and acceptable quality. Other points to be considered in planning the system are ease of access to the supply facilities, protection from vandalism, identification of the exact location of all transmission lines and easements as part of the overall development plan, and the designation of responsibility for all future maintenance to the system.

The major limitation to this type of water supply system would probably be the installation of transmission lines. Portions of the proposed subdivision are very stony or bouldery, and it appeared that some segments may be close to bedrock. This will result in increased costs of installation. An extensive investigation should be made to determine the most feasible location of the transmission line.

Individual on-lot wells are also feasible as a means of water supply. Due to the variability of behavior of wells in crystalline bedrock, they may be preferable to community wells. However,

individual wells would reduce the flexibility for locating on-site sewage disposal systems.

WASTE DISPOSAL

A municipal sewage disposal system is not planned for this area in the immediate future, so on-site systems will have to be utilized. Almost 30 percent (40 acres) of the site has very severe limitations for the installation of on-site sewage disposal systems. These are the inland wetland soils and should not be used for sewage disposal systems.

The remaining areas have moderate to severe limitations due to the presence of a high seasonal water table (mainly in the hardpan soils), shallowness to bedrock, and slopes over 8 percent. The loose upland till soils present moderate limitations for on-site sewage disposal systems, due primarily to steep slopes. The problems can be minimized through careful location of the systems.

The hardpan and rocky soils present severe limitations for on-site sewage disposal. However, the low development density of 2 acres per lot should allow for greater flexibility in locating the most suitable areas for the systems. On each lot, the investigation and location of a good septic disposal area should precede the selection of the building site. A deep observation hole and seepage test should be made and evaluated. In certain cases, lots may require site improvement work, such as drainage and fill, in order to support a subsurface leaching system. Generally, the construction of leaching systems in fill on slopes or hillsides should be avoided as there is a tendency for the sewage to flow downhill and to break out at the lower end.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

The inland wetlands also present very severe limitations for the installation of footings or basements. There is a high water table and even though the drainage areas associated with the streams are relatively small, occasional flooding can be expected.

The remaining soils have from slight to severe limitations for home construction. The two major concerns that classify an area as having severe limitations are the seasonal high water table, present mostly in the hardpan soils, and the shallowness to bedrock in the rocky soils. Providing there is an adequate outlet, the seasonal high water table can be overcome to a certain extent by the installation of foundation or curtain drains. When shallowness to bedrock is the limiting factor, a good foundation investigation should reveal the best location for the footings to reduce the chance of differential settlement.

In developing any site, erosion is present and can develop into severe problems if adequate preventative and control measures

are not taken. Preparation of an erosion control plan prior to construction is recommended for all developments. Some procedures which help reduce erosion are as follows: not clearing a site until construction is ready to begin; clear and/or disturb only those areas essential to construction; grade, fertilize, and seed or sod disturbed areas as soon as practical. There are also numerous vegetative and mechanical measures which can be used to prevent and control erosion. Standards and specifications for these measures are provided in the Erosion and Sediment Control Handbook for Connecticut, published by the Soil Conservation Service. Copies of the handbook, as well as technical assistance in preparing an erosion control plan, are available from the local Soil Conservation Service office.

ROADS AND UTILITIES

There are two available access points to the property. The one located on Brown's Lane should offer little difficulty from the standpoint of safety. The one located along Mile Creek Road is on a curve and at the crest of a hill. There may have to be some grading or relocation of Mile Creek Road to render this a safe access.

As this area of Old Lyme develops there will be a need for an improved and widened feeder road system. This will require an upgrading of the existing road network. The town should have a scheduled improvement program for this purpose.

With the exception of the inland wetland soils, which have very severe limitations, the area has moderate to severe limitations for construction of roads. A thorough preliminary investigation could enable the developer to plan road locations that would reduce installation costs by avoiding boulders and ledge. Good subgrade drainage will help minimize future maintenance costs. Roads through the wetlands should be avoided. However, if a low area must be crossed, culverts should be properly designed and installed to prevent flooding and washouts.

During the construction of a development of this nature, the most critical phase in terms of erosion occurs with the installation of roads. There are construction methods and practices that have proven effective in reducing it (these are included in the Erosion and Sediment Control Handbook). Some examples are: make earth cuts or fills no steeper than 1 vertical to 3 horizontal to enable ease in the establishment and maintenance of good vegatative cover; design and install roadside gutters, curbing, and an effective storm drain system; and where applicable, install temporary or permanent erosion control measures.

As with water supply transmission lines, underground utilities will face problems in installation due to stony or bouldery conditions and shallow depth to bedrock. Again it is recommended that a careful investigation be made to determine the best location for the utilities.

POTENTIAL HAZARDS

The part of the site most subject to damage is the inland wetlands. The Armstrong Brook drainage system begins in the vicinity of this site and sedimentation or pollution could affect the water quality of the entire stream. Prevention and control of erosion and sedimentation has previously been discussed. The other area in which special care is needed is with septic disposal systems. Improperly designed or installed septic disposal systems could pollute the streams or, if close to ledge, could contaminate wells. Good design and construction practices, together with watchful code enforcement officials, will be needed to assure the town that every precaution is being taken to avoid this possibility.

AESTHETICS AND PRESERVATION

The streams and their associated wetlands within the Timbercreek Subdivision are not suitable for development and should be preserved as open space, except where a road may have to cross a stream. In order to help protect the wetlands and streams from sedimentation arising from erosion and contamination by septic systems, it is recommended that a buffer zone of 150 feet be established between the wetlands and construction areas. The resulting open space corridor would provide a break between developed areas and afford some protection of the wildlife habitats.

Climatology. Development of the site will have very little microclimatic effect. However, the prevailing winds are from Long Island Sound (southwest) and it would be best to maintain the forest vegetation along the south edge of the property to protect the area from strong winds, thus minimizing heating loss from the houses. Also, minimum disturbance of the overstory vegetation during development will maintain the woodlands microclimate of the area.

Forestry. This is entirely an old field and pasture that is coming into trees. It is too understocked to be a commercial forest and the rate of growth is not high for its age and open spacing. As it is openly spaced, it would be wind firm if roads and building lots were put in and many existing trees would lend themselves to lawn shade and songbird habitat. The understory of green briar in some areas may pose a problem to future homeowners.

Wildlife. The diverse cover ranging from mixed hardwood upland and old pastures to red maple swamps presents a good overall wildlife habitat. The supply of valuable wildlife food shrubs range from excellent in some areas to poor in others. The swamps have a particularly generous understory of these shrubs. The site potentially supports such wildlife species as deer, grouse, rabbit, squirrels, and numerous songbirds. Development of the upland portion of the site will result in a reduction of the numbers of most species and elimination of some.

Fish. Fish are not a consideration on this site.

SERVICES TO SUPPORT DEVELOPMENT

Public services provided by the town will consist of education, road maintenance, police and fire protection, and garbage and trash collection. The Old Lyme educational system is not under any particular stress at this time and should be able to cope with the additional students. It might be desirable to have the developer either install fire hydrants or construct a fire pond(s) in the wetlands. With regard to garbage collection, this is provided by the town by contract with a private collector. Old Lyme's disposal site is the only one in the Connecticut River Estuary Region found to be acceptable and workable by the State Department of Environmental Protection, with a reasonable life span remaining.

COMPATIBILITY OF SURROUNDING LAND USES AND ALTERNATIVE LAND USES FOR THE AREA

The Timbercreek Subdivision should present no conflict with surrounding land uses since this entire area of Old Lyme is zoned for single-family housing at a low density.

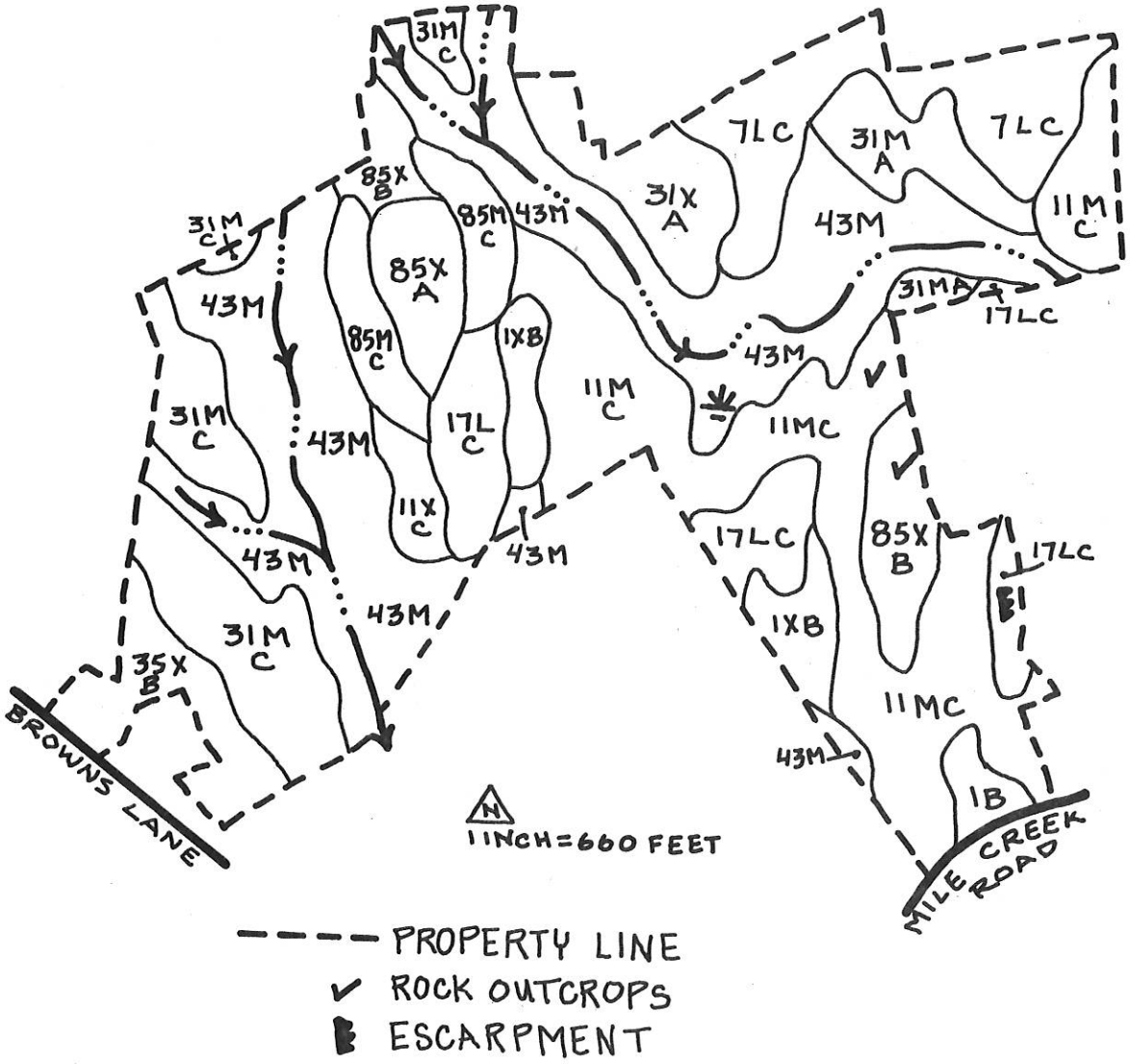
An alternative for development not presently available in Old Lyme is that of "clustering" housing on the more suitable locations in order to avoid disruption of the more fragile areas. In particular, the loose upland till soils could probably sustain a somewhat higher density of housing, thus allowing areas of ledge, steep slopes, and wetlands to be left intact and undisturbed, without sacrificing the total number of housing units or exceeding the desired overall density.

APPENDIX

SOIL MAP

TIMBERCREEK SUBDIVISION

OLD LYME, CONNECTICUT



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

ADVANCE COPY, SUBJECT TO CHANGE *NOVEMBER, 1973*

SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Acres	Percent of Total Acres	Limitations For: ** On-Site Sewage	Basements	Landscaping	Streets and Parking	Principal Limiting Factor
B-1b	11XC	2.0	1.4	2	1	2	3	Slope 8-15%, droughtiness
B-1c	11MC	26.5	19.1	2	2	3	3	Slope 3-15%, stoniness
B-2a	1B, 1XB	6.2	4.5	2	2	2	2	Seasonal high water table, slope 3-8%
B-3b	43M	40.0	28.8	4	4	4	4	High water table, stoniness
C-1a	85XA, 85XB 35XB	14.6	10.5	3	1	1	2	Hardpan, slope 0-8%
C-1c	85MC	6.4	4.6	3	2	3	3	Hardpan, slope 3-15%, stoniness
C-2a	31XA	5.5	4.0	3	2	2	2	Hardpan, moderately high seasonal water table
C-2b	7LC, 31MA 31MC	29.1	21.0	3	3	3	3	Hardpan, seasonal high water table, slope 0-15%
D-1	17LC	8.5	6.1	3	3	3	3	Shallow to bedrock, slope 3-15%
		138.8	100.0					

* Refer to Know Your Land, Natural Soil Groups for Connecticut, Soil Conservation Service, USDA Connecticut Cooperative Extension Service, for further explanation of the natural soil groups.

** Limitations: 1-slight; 2-moderate; 3-severe; 4-very severe.

ACREAGE SUMMARY OF SOILS LIMITATIONS

	Slight		Moderate		Severe		Very Severe	
	Acres	%	Acres	%	Acres	%	Acres	%
On-Site Sewage	-	-	34.7	25.0	64.1	46.2	40.0	28.8
Basements	16.6	11.9	44.6	32.2	37.6	27.1	40.0	28.8
Landscaping	14.6	10.5	13.7	9.9	70.5	50.8	40.0	28.8
Streets and Parking	-	-	26.3	19.0	72.5	52.2	40.0	28.8