



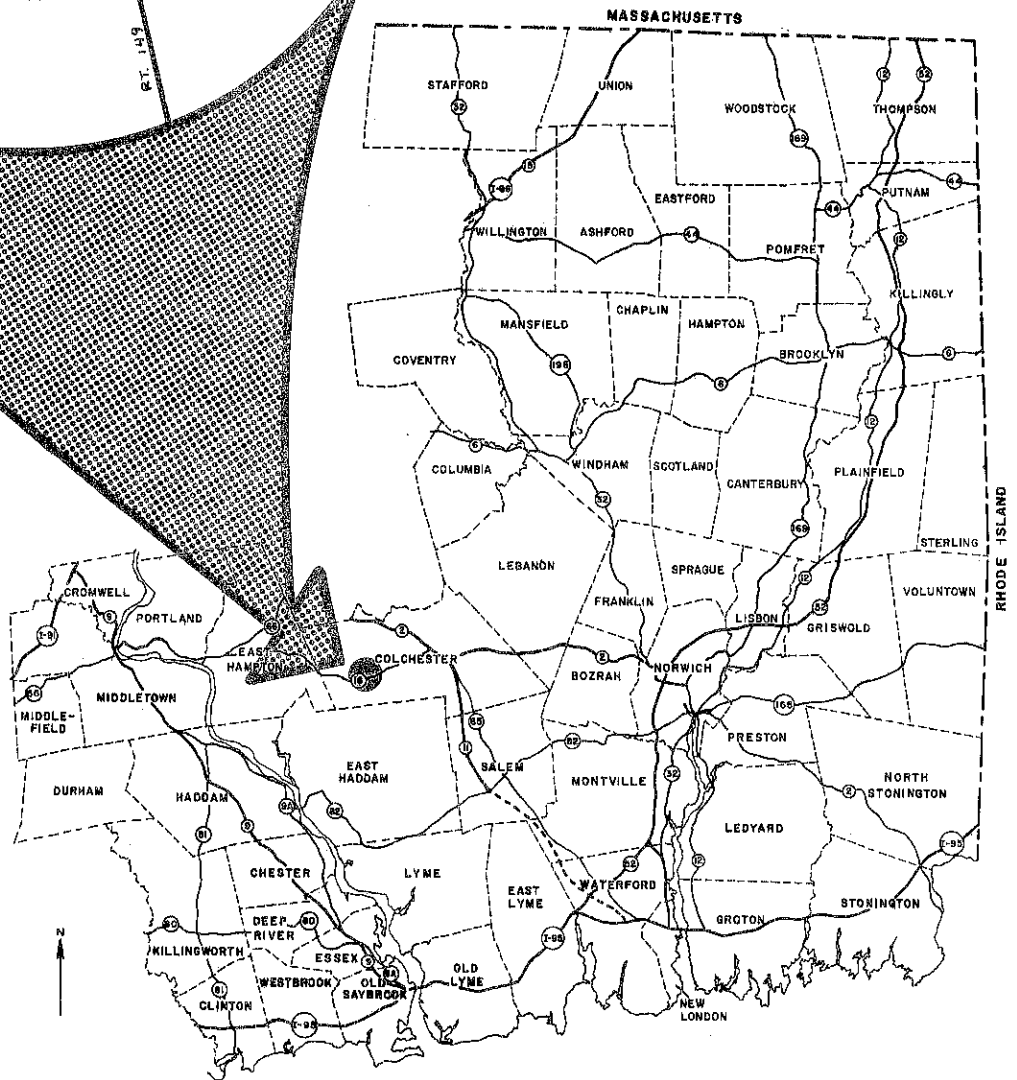
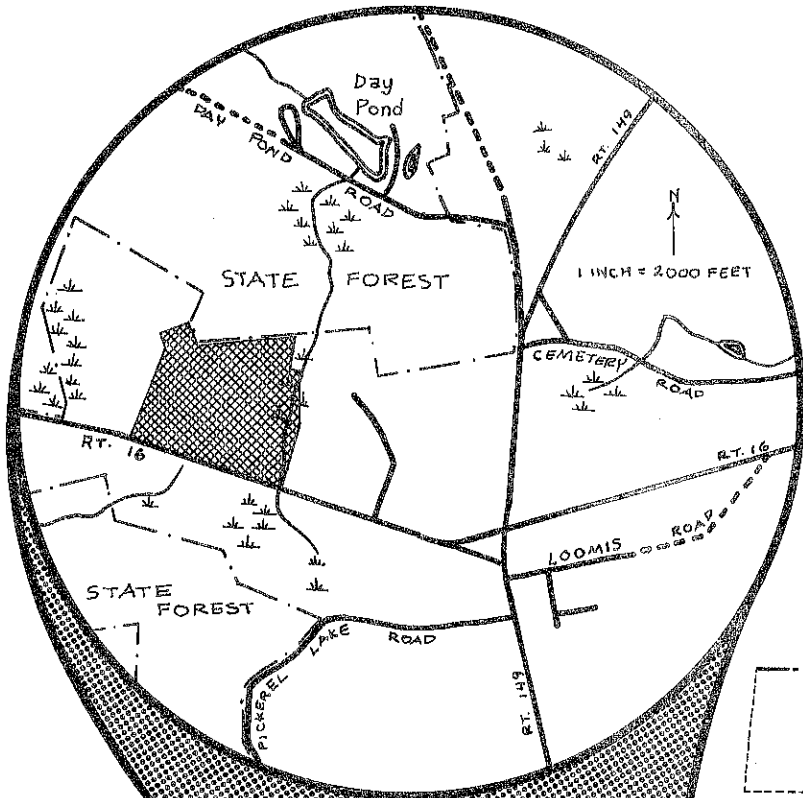
ENVIRONMENTAL REVIEW TEAM REPORT  
ON  
WESTCHESTER ACRES  
COLCHESTER, CONNECTICUT  
MAY, 1975

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

# LOCATION OF STUDY SITE

WESTCHESTER ACRES  
COLCHESTER, CONNECTICUT



EASTERN CONNECTICUT  
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

10 Miles

ENVIRONMENTAL REVIEW TEAM REPORT  
ON  
WESTCHESTER ACRES  
COLCHESTER, CONNECTICUT

This report is an outgrowth of a request from the Colchester Conservation and Planning and Zoning Commissions, with the approval of the landowner, 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 Executive Council 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 subdivision consisted of the following personnel: Sherman Chase, District Conservationist, Soil Conservation Service (SCS); Timothy Dodge, Biologist, SCS; Richard Hyde, Geologist, Natural Resource Center, Connecticut Department of Environmental Protection (DEP); Charles Phillips, Fishery Biologist, DEP; Huber Hurlock, Forester, DEP; Donald Capellaro, Sanitarian, Connecticut Department of Health; Thomas Seidel, Planner, Southeastern Connecticut Regional Planning Agency; William Lucas, Project Coordinator, Eastern Connecticut RC&D Project; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on March 20, 1975. 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 the developer and the Town of Colchester. 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 Council 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

Westchester Acres is a proposed subdivision situated in the western section of Colchester, known as Westchester. It encompasses about 45 acres and abuts the southern boundary of the Salmon River State Forest. A stream running northward along the eastern boundary of this site feeds into Day Pond of the Day Pond State Park.

The majority of the site is located on a ledgy hill with numerous rock outcrops and steep slopes. There are several wetland areas on the site as well, located along the natural drainage ways.

The present subdivision plan indicates a total of 38 lots, an acre or more in size. Access to the site is from Route 16. There has been some discussion of plans to extend one of the subdivision roads eastward to connect with an existing road, Victoria Drive. This would necessitate crossing the major wetland area and stream. All other roads within the subdivision are presently proposed as dead ends. Both water supply and sewage disposal facilities will be developed on-site.

In this report the existing resources on the site will be described followed by an evaluation of the various aspects of the proposed development. Comments or recommendations made within the report are presented for consideration by the developer and town in the preparation and review of the development plans, and should not be construed as mandatory or regulatory in nature.

## EVALUATION



## SITE DESCRIPTION

Topography and Geology. Topographically, the property is the southeast extremity of an irregularly formed hill. The land can generally be described as an area of numerous bedrock outcroppings. The rock outcrops form several prominent steep-sloped knobs within the interior of this parcel with several smaller lines of visible exposures running northeast by southwest. One well-defined line of exposures on the eastern side of the property forms a low drop-off which delineates the western side of the major wetland area. A topography map of the site and surrounding area is shown on the opposite page.

Bedrock in this area falls in the Brimfield Schist classification. A schist is defined as a rock that has undergone intense conditions of pressure and temperature resulting in thin (3 to 5 inches) bands. This is a gray or rust stained schist composed of several sub-schist types. The most prominent type has a high content of garnets and mica. Another less common type has a predominant mineral content of garnet, quartz, and biotite mica.

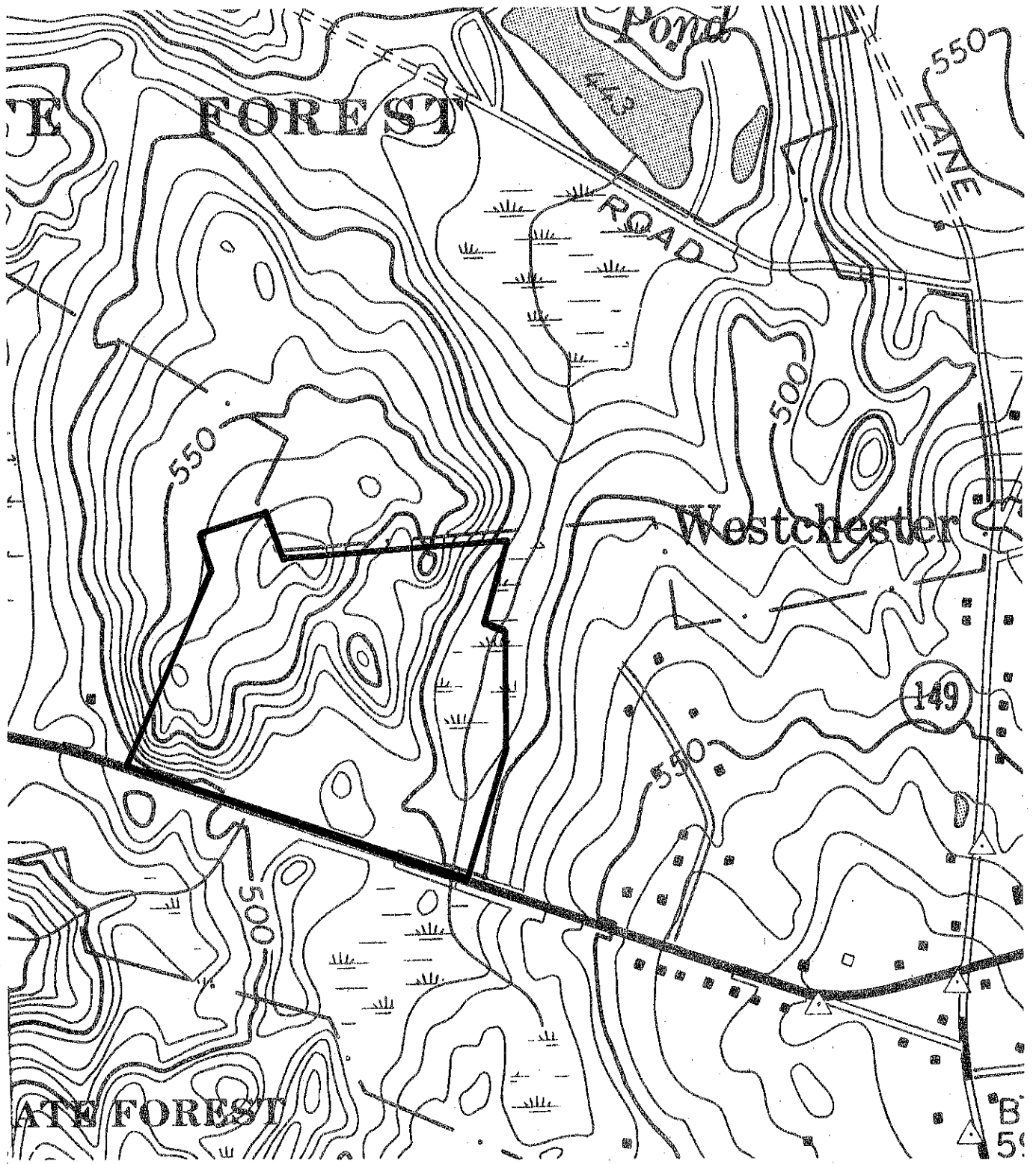
On this site, the unconsolidated overburden (surficial materials) lying on top of the bedrock surface is relatively thin, although thicker deposits can be located with subsurface exploration. The overburden material is classified by the surficial geologist as till. This material is the predominant overburden in Connecticut and is the type of glacial deposit that was relatively unaffected by water transport. After the glacial ice melted, there remained a mass of material; this mass is termed till. More specifically, till is defined as a heterogeneous material composed of varying mixtures of boulders, gravel, sand, silt, and clay particles, none of which are significantly sorted or stratified according to grain size, as it is with waterlain deposits.

Soils. A detailed soils map of the site is given in the Appendix to this report along with a soils limitations chart. Due to the original scale at which the soils are mapped (1"=1,320') the lines shown on the soils map should not be viewed 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 disposal, basements, landscaping, and streets and parking. However, limitations, even though severe, do not always preclude the use of the land for development. If economics permit greater expenditures for land development and the intended use is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used.

For purposes of discussion, the soils on the site can be broken into 3 groups. There are 2 soils (12.8 acres) on the site which are classified as inland wetland soils, 43M and 91. The 91 soil, peat and mucks, is located adjacent to the brook which flows northward to Day Pond. It consists of thin organic deposits of muck less than 36 inches generally over coarse materials. The 43M soil is a stony complex made up of poorly and very poorly drained soils. Both wetland soils have high water tables. The depressions in these soils are carrying the surface runoff from the area.

A small portion of the site, 2.8 acres, is classified as hardpan soils, 31B and 31XB. They are moderately well drained upland soils with a slowly permeable hardpan at about 2 feet in depth. Water may move laterally down slope over the hardpan in wet seasons.

# TOPOGRAPHY



— APPROXIMATE BOUNDARY OF PROPERTY

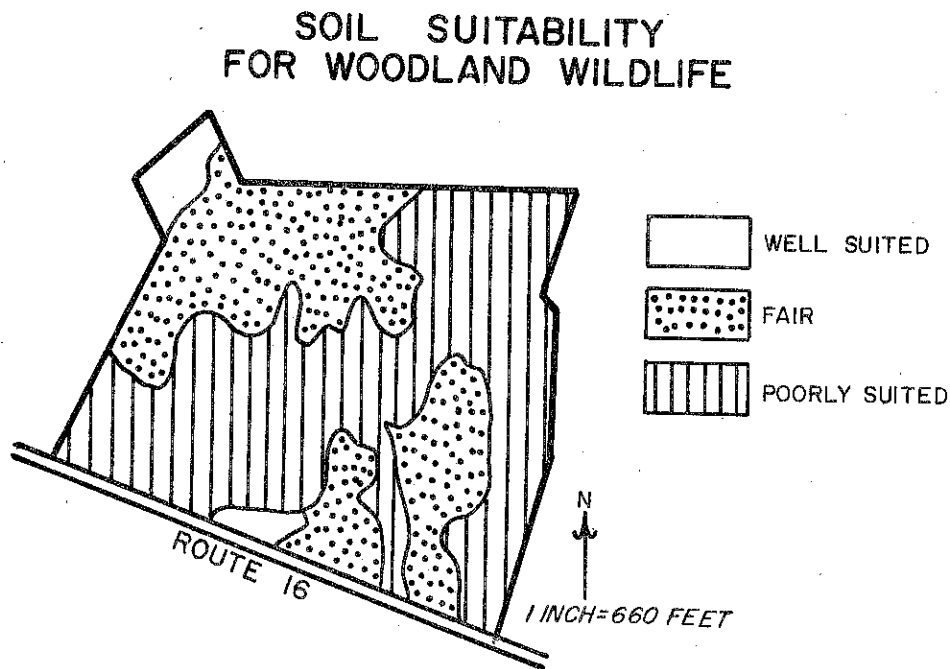


The majority of the site, 40 acres, are rocky upland soils, shallow to bedrock (17LC and 17LD). This is a complex consisting of about 50 percent shallow well drained loamy soils over bedrock, 25 percent moderately deep well drained loamy soils over bedrock, and about 25 percent deep well drained loamy soils. The topography is characterized by undulating to rolling upland ridges and depressions with the shallow to bedrock soils occurring on the ridge tops, the deep soils in the depressions, and the moderately deep soils between.

Vegetation and Wildlife. Three forest types are present on the site. They are all on soils that cannot tolerate disturbances in soils or water table without heavy mortality. The swamps are comprised of mixed hardwoods, primarily red maple. The northern and western half of the acreage is a mixed hardwood stand, fully stocked. Scarlet and white oaks, red maple, and some hemlock growing very slowly on shallow soil occupy the site. The roots are quite near the surface. The south central area (about 25 acres) exhibits red and white oaks, red maple, and tulip poplar in a slightly overstocked pole stand.

This is not a high value timber production site. It is marginal on the high north and west sides, non-commercial in the swamp areas, and low to medium in the south central area.

The site provides habitat primarily to woodland wildlife, both game and non-game species.\* The woodland cover consists primarily of mixed hardwood trees in



\* Woodland wildlife - Animals that frequent wooded areas containing either hardwood or coniferous trees and shrubs. Examples include ruffed grouse, white-tail deer, woodpecker, thrush, vireo, woodcock, squirrel, gray fox, and raccoon.

the overstory including birches, red maple, red oak, and American beech. The shrubby understory varies from being sparse in wet areas and where rock is close to the surface to moderately dense in the northwest portion of the site. The cleared field area of the northwest portion contains grasses and an herbaceous border. Utilization of the site by wildlife is high, with browsing by deer in the northeast portion extensive. The heavy use of the area by deer indicates that the area is probably used as a crossing area between sections of the State Forest to the north and south of Route 16. Woodpecker and songbird usage also appears high. Cottontail rabbits browse the herbaceous field border and grasses. Populations of gray squirrel and ruffed grouse are probably low. The wetter areas of the site may provide seasonal woodcock habitat.

Quality of the habitat varies with the site. However, the overall potential for woodland wildlife is fair with 44 percent of the area having slight or moderate limitations. Most of the site has an easterly or southerly exposure, which ensures ample sunlight. Some portions of the site are poorly suited to tree growth due to shallow soil conditions, though many shrubs and vines as well as hardwood sprouts desirable for wildlife readily establish themselves.

Wetlands on the site comprise approximately 26.5 acres. Most of this acreage is covered with mixed hardwoods, primarily red maple, and contains a sparse understory. The functions or wetland roles of these areas appear to include seasonal floodwater storage and providing natural drainage ways for on-site and off-site water. In addition, they have values to wildlife as habitat and travel lanes.

A chart showing the suitability of the different soils for woodland, openland, and wetland wildlife habitat is given in the Appendix.

All the stream systems in this area eventually flow into the Salmon River, a Class A stream which supports trout. The stream running along the eastern edge of the property drains northward to Day Pond State Park. Day Pond is used for swimming and fishing.

Surrounding Land Uses. Surrounding land uses are residential and undeveloped. Neighborhood commercial uses are located east of the site at the intersection of Routes 16 and 149. Salmon River State Forest borders the property to the north while the stream along the eastern edge of the site flows north about 1/2 mile to the swimming area in Day Pond State Park.

#### WATER SUPPLY

The water supply for the proposed subdivision is to be from individual on-site wells. There are basically two types of on-site wells: dug or screened wells placed in the surficial materials and drilled wells in bedrock. From the Team's on-site visit and the preliminary information for the Lower Connecticut River Basin water resources investigation, it is evident the types of overburden materials and conditions necessary for large quantity water supplies do not exist on this site. Dug or screened wells placed in till cannot produce the required water yields necessary for a municipal supply, although it may be capable of meeting the needs of a single family dwelling. Till tends to be found in thin deposits as is the general case here, and this factor, in combination with its rather poor water transmitting capacity, causes the time it takes for the well to refill once water is withdrawn to be painfully long. Thus, a well without a large storage capacity might run dry during periods of heavy usage.

The bedrock in this region is generally hard and dense with tightly interlocking mineral grains, making the passage of water through the intergranular openings fairly slow and difficult. Drilled bedrock wells therefore derive little water from this source, but rather from the water passing into the well from cracks, joints, and fissures of the rock intersecting the well shaft. It therefore can be seen that bedrock wells are only as good as the number and size of the bedrock openings below the water table that empty into the well. The more numerous and the larger the fractures and openings, the more water a well will be capable of receiving in the shortest possible time period. This, in turn, will mean the more water that will be available to the user. As a general rule, however, the number and size of these bedrock openings decline with depth. From existing well records throughout the Connecticut uplands, it is evident wells drilled in the order of 200 to 250 feet produce proportionately more water per foot drilled than a well drilled to 400 feet. In other words, the cost, on the average, from putting additional well footage below 200 to 250 feet in depth far exceeds the water benefit return. If needed, the additional water storage capability of a deeper well can be accommodated at lesser cost with a surface storage tank. In this part of Connecticut, it can be expected that 9 out of 10 bedrock wells will yield at least 3 gallons of water per minute.

The water quality of the drilled wells should be satisfactory. However, it is noted that the bedrock, Brimfield Schist, has a high iron content and water withdrawn from wells in this rock may also have a high iron content, which could necessitate corrective treatment for normal domestic uses. With large lots it should be possible to locate the wells properly in respect to possible sources of pollution without major difficulty. In general, the location of wells for individual lots should be placed upslope and as far away as possible from the location of the septic systems.

#### WASTE DISPOSAL

Based on visual observations, soil survey mapping information, and consideration of the physical features, it must be concluded that subsurface sewage disposal will present considerable difficulty on most of this property. Such adverse factors as steep slope, ledge rock at or close to ground surface, seasonal high ground water, and wetlands with both intermittent and perennial streams impose limitations. It is understood that in the spring of 1974 the developer's engineer made a number of deep observation pits and seepage tests, with the percolation rates generally being in the range of one inch in 13 to 18 minutes. Thus, in most cases, it is not a question of the soil itself having poor seepage, but rather the other unfavorable conditions which were previously mentioned.

In considering the proposed subdivision, the density level should be kept low to afford compensation for the site limitations. Detailed engineering investigation should be made for each proposed lot in order to be assured of adequate suitable ground area for the installation of the sewage leaching systems which would be needed. Consideration must also be given for reserve leaching areas. It would seem that considerable site work including regrading would be involved in portions of the property.

The proposed lots along the wetland to the east, as indicated on the plot plan, appear to extend well into the existing wetland while the front of the lots

are predominantly within the areas of thin overburden and numerous bedrock outcrops. It would appear that without extensive filling of the wetland and/or the front of these lots, severe difficulty in the location of septic systems will be encountered. As was noted earlier, the stream in this wetland flows into a public bathing area. It is important that in the development and future use of this watershed, the quality of the stream water be maintained. Because the wetland is in such close proximity to these lots and serves as the natural surface and sub-surface discharge point for water from these lots, improperly placed septic systems may rapidly discharge their effluent to this body. Not only could this affect the sanitary quality of the water, but an increase of nutrients could also result in algae blooms in Day Pond. Thus, if any lots are to be permitted in this area, thick pockets of overburden materials should be found for individual septic systems and reserve areas and then the lot dimensioned around this. It may be desirable to eliminate the lots directly adjoining the major wetland area.

#### FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

Constructing homes on the ledgy soils is possible and can result in an attractive development. However, due to the varying depths to bedrock, careful engineering and design will be necessary to avoid problems of differential settlement. Basements may not be feasible on much of the site due to the bedrock.

If runoff is controlled, there will not be a need for expensive surface water control structures. This can be accomplished by leaving a large percentage of the area in woodland, which would include the wetlands, steep areas, and a portion of woodland on each building lot.

Erosion control, particularly in the area nearest the eastern wetland, should be considered in the planning stages. Examples of measures which might be used include leaving the wetlands undisturbed, timing construction to prevent disturbing large areas at one time, and seeding disturbed areas. The New London County Soil and Water Conservation District could, if requested, assist with planning the erosion control measures after the final site plans have been completed.

#### ROADS AND UTILITIES

Construction of roads and utilities will encounter difficulties due to the shallow bedrock conditions on much of the site. Care should be taken in the layout and design of the road system to not alter the existing surface drainage patterns. The easternmost road, running parallel to the major wetland, should be designed to minimize possible contamination of the stream or wetland from runoff. Settling basins or possibly a long settling ditch running alongside the road might be incorporated into the plans.

The layout of the roads as indicated on the present plans present some technical planning problems. On the proposed plan, the road leading to lot 8 is about 1,200 feet in length and the road to lot 23 is about 2,050 feet. Both of these roads end in cul-de-sacs. Although dead end streets can cut down on through traffic, they are not desirable in terms of access of emergency vehicles such as police, fire, and ambulance vehicles. In addition, turn around areas (cul-de-sac) in some cases slow down and prove difficult for such municipal functions as snow plowing. Current

subdivision regulations in Colchester specify a 600 foot maximum length for dead end streets.

If Victoria Drive, a present dead end street of about 2,000 feet, were extended across the wetland to lot 7, this would eliminate one dead end street on the proposal as well as that of Victoria Drive. However, constructing a road through the wetland will create other problems. Of primary concern would be the sedimentation of the stream and Day Pond during construction. This would be a difficult problem to control and could not be entirely prevented. There is also a question of sand and salt from the roads gaining direct access to the stream once the road is in use. In arriving at a decision the benefits of constructing the road will have to be weighed carefully against the hazards during and after construction.

The subdivision regulations also require two access points for subdivisions over 30 lots. If the road ending at lots 26 to 29 could be returned to Route 16, this would shorten the dead end road to lot 23 as well as provide a second access. However, steep slopes present problems at possible access points to Route 16 at lots 27, 28 and 38. If the number of lots are reduced, a single access road would meet the requirements of the subdivision regulations.

#### POTENTIAL HAZARDS

As described earlier, this site is within the watershed which feeds Day Pond and eventually the Salmon River, both of which are of high quality and support trout fishing. Due to its proximity to the site and its additional use as a public swimming area, Day Pond is of particular concern. Potential hazards to this facility from the development of Westchester Acres include contamination from septic systems and/or storm runoff and sedimentation of the wetlands, stream, and pond from site development and road construction.

Development of the lots adjoining the major wetland present the greatest concern. Due to ledge, slopes, and the wetland, proper placement of on-site sewage disposal systems will be difficult. A reduction in the number of lots or possibly the elimination of the lots alongside the wetland is recommended. Suitable locations for septic systems and their reserve areas should be the prime consideration. If lots are developed in this area, specific erosion control measures should be included as part of the plans.

Storm runoff should not present any severe problems provided most of the site is kept in its natural state and runoff is not provided with direct access to the stream. If a road is constructed across the wetland this could present some problems with both runoff and sedimentation. The advantages of eliminating two dead end roads should be weighed carefully against the possible hazards to Day Pond.

Throughout the site, attempts should be made to maintain the natural drainage patterns and vegetation wherever possible.

#### VEGETATION AND WILDLIFE

The forest vegetation on the site will not tolerate disturbances in the soils

or water table without heavy mortality. The trees in the swamp will die if the area is flooded or drained. In the northern and western portions, the roots of the trees are quite near the surface. Compaction of the soil, excavation, or filling would probably kill the nearby trees. Clumps of trees of 1/4 acre or more in area would probably survive if left undisturbed. In the south central area, individual trees again would probably not survive because the trunks of the trees aren't thick enough to support the crowns alone. Also, the water table appears to be seasonally high which results in shallow root systems. Changes in the water table from roads, regrading, and fills may raise the local water tables or create areas of standing water, thus killing groups of trees as well as individual trees. Therefore, in order to preserve some of the natural vegetation and the aesthetic quality of the area, roads, cuts, and fills should be done so as not to alter the natural drainage patterns.

Development of the area to housing will reduce the available habitat for wildlife. A loss of understory shrubs will reduce food and cover. Songbirds and small mammals will probably increase as more grassy areas are established. However, woodpeckers will decrease as dead and dying trees are removed.

Large game, in particular the whitetail deer, will probably be eliminated from the area. However, with the state forest lands being adjacent to the site, the deer may be expected to browse on shrubs on the adjoining lots.

Development which would be least damaging to wildlife would include undeveloped bands or buffer areas of woodland at least 200 feet wide weaving through portions of the site and joining the state property. Roads should not pass through these areas. Planting shrubs along the borders of these areas would enhance their wildlife values. Unfortunately, the land best suited to wildlife habitat will also be best suited to housing; therefore, a carefully thought out plan of development is necessary.

Development of the wetlands through filling or use as placement for subsurface sewage systems will place their functions in jeopardy. Filling would reduce natural floodwater storage potential and possibly restrict natural drainage patterns. Development of lots which include wetland soils along the easterly border increase chances of erosion and sediment transport and contamination from septic effluent to downstream areas. By not developing the lots along the easterly border, a buffer would remain to protect water quality and reduce erosion hazards associated with development. Other lots shown on wetland soils should be protected from possible development to ensure adequate septic systems and protect the natural drainage ways.

The existing field along the northwest corner of the property is not proposed for development. It therefore offers an opportunity for a recreation area for the subdivision. It could be maintained as a playfield and incorporate backboards, baseball diamond, etc., and at the same time would retain its wildlife values. The field is located away from Route 16 and the subdivision access roads and abuts the state land, so safety should not be a problem.

#### COMPATIBILITY OF SURROUNDING LAND USES

On a land use basis, the proposed residential use of the site appears to be



compatible with the surrounding area, provided the potential hazards to Day Pond can be eliminated or controlled. There will be a negative impact on the wildlife value of the area, particularly for large game. The development would probably disrupt the use of the site as a deer crossing area.

#### ALTERNATIVE LAND USES FOR AREA

The alternatives for this site appear to be residential use or undeveloped open space. Most of the property is poorly suited for agriculture or forestry and is too remote and lacks the utilities for industrial or commercial uses. As a residential area, a low density development is suggested which provides for natural drainage, wildlife areas, and preservation of as much natural vegetation as possible, as well as proper locations for roads, homesites, and septic systems. As an open space area the site would continue to provide wildlife habitat, a possible deer crossing area, and protection of the high quality watercourse feeding Day Pond.

#### SUMMARY AND ADDITIONAL COMMENTS

The area, if properly developed, could result in a subdivision with above average aesthetic appeal. The bedrock outcrops and mountain laurel provide a desirable setting and could enhance future development. However, the site also exhibits many characteristics which present severe limitations for development and which require serious consideration in the final layout and design of the subdivision.

The principal limiting factors on the site are the wetlands, steep slopes, and shallow to bedrock conditions. There are several wetland areas on the site with the most significant one running along the eastern boundary. All of these areas are part of the natural drainage patterns on the site. They also serve as seasonal floodwater storage areas. For these reasons, preservation of the wetlands to the extent possible will help maintain the natural quality of the area.

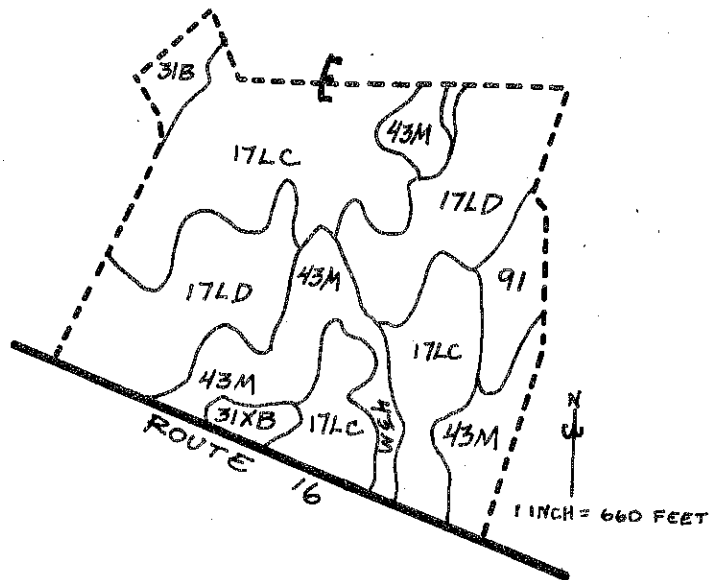
The steep slopes and shallow to bedrock soils present difficulties for development, but do not necessarily preclude development. Pockets of deeper soils can provide suitable locations for basements and septic systems. By locating these areas before establishing lot lines, each lot can be assured of having good development potential.

Specific suggestions in regard to the various aspects of development have been presented within this report. Septic systems, roads, erosion and sediment control, wildlife habitat, and protection of Day Pond all require additional consideration in the planning stages by both the owner and the town. With careful and proper planning, however, the potential for an aesthetically pleasing development exists.

APPENDIX

# SOIL MAP

ROMANELLA PROPERTY  
LEDYARD, CONNECTICUT



Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE  
Soil Conservation Service

ADVANCE COPY, SUBJECT TO CHANGE

FEBRUARY, 1975

## SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Area (Acres)	% of Total	Limitations For:**				Principal Limiting Factors
				On-Site Sewage	Base-ments	Land-scaping	Streets and Parking	
A-3b	91***	3.2	7.2	3	3	3	3	High water table, organic material.
B-3b	43M***	8.6	19.3	3	3	3	3	High water table, stoniness.
C-2	31B	1.6	3.6	3	2	2	2	Hardpan, seasonal highwater table, slope 3-8%.
C-2	31XB	1.2	2.7	3	2	2	2	Hardpan, seasonal highwater table, slope 3-8%, stoniness.
D-1	17LC	16.8	37.7	3	3	3	3	Shallow to bedrock, slopes 3-15%.
D-2	17LD	13.2	29.5	3	3	3	3	Shallow to bedrock, slopes over 15%.
		44.6	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.

\*\*\* Inland wetland soils.

SOIL SUITABILITY  
FOR WILDLIFE

<u>Map Symbol</u>	<u>Area (acres)</u>	<u>% of Total</u>	<u>Woodland Wildlife</u>	<u>Openland Wildlife</u>	<u>Wetland Wildlife</u>
91	3.2	7.2	3	3	1
43M	8.6	19.3	3	3	2
31B	1.6	3.6	1	1	4
31XB	1.2	2.7	1	2	4
17LC	16.8	37.7	2	3	4
17LD	13.2	29.5	3	3	4

Note: 1=Well suited; 2=fair; 3=poorly suited; 4=very poorly suited.