ENVIRONMENTAL REVIEW TEAM REPORT
ON
WINDHAM HILL
ASHFORD AND WILLINGTON, CONNECTICUT

NOVEMBER, 1973

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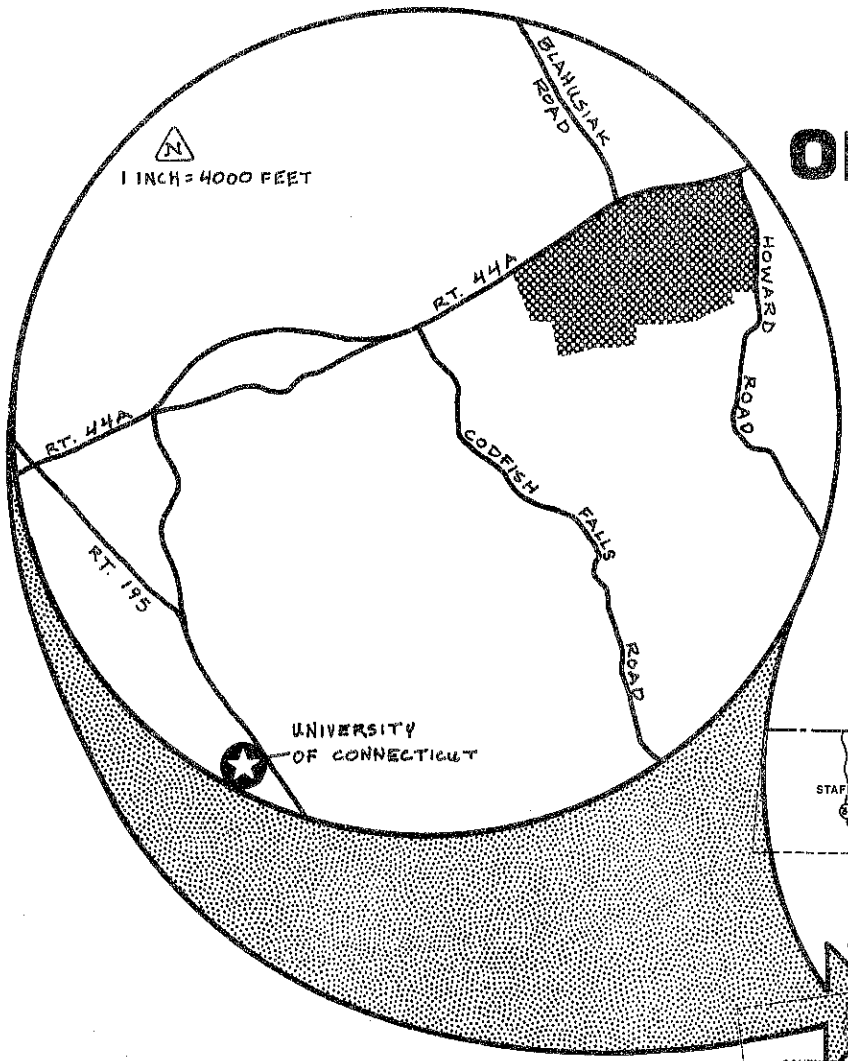
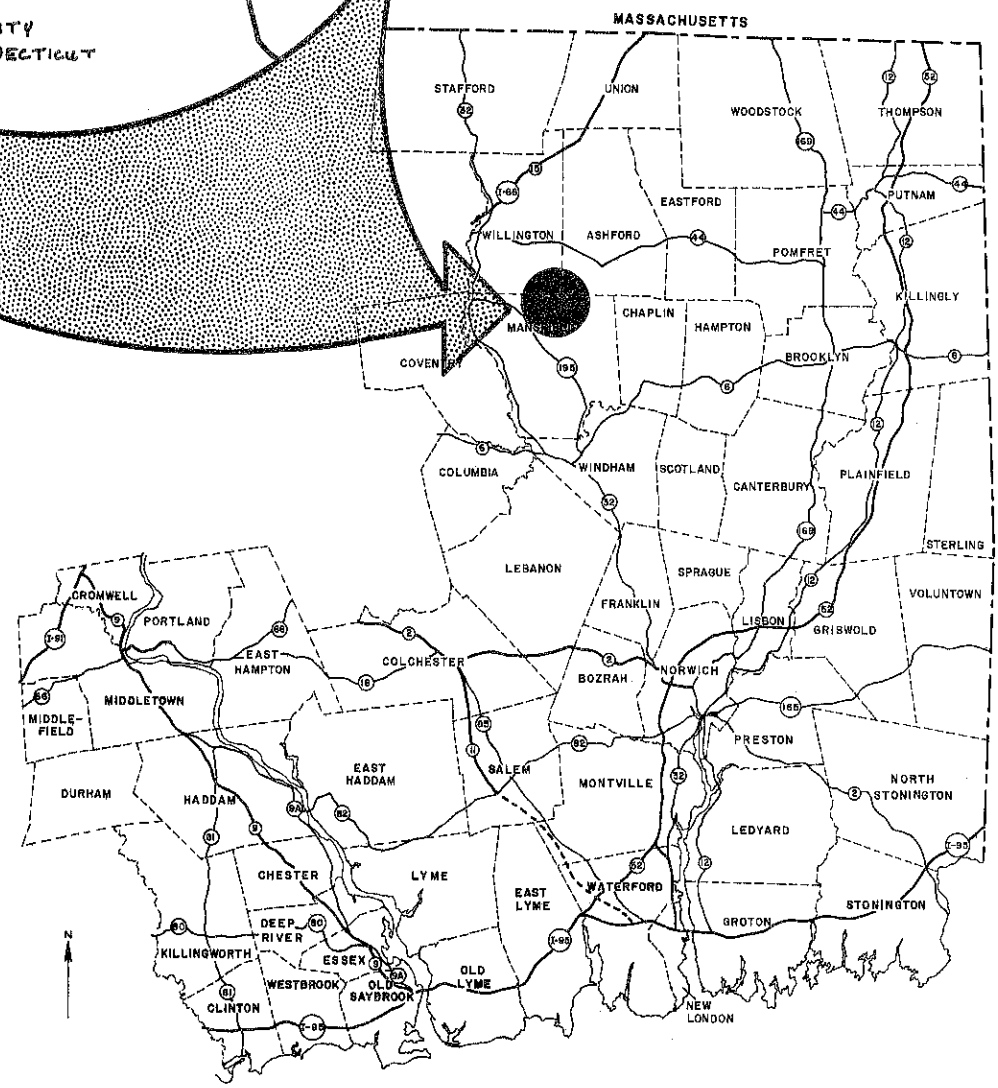
EASTERN CONNECTICUT RESOURCE CONSERVATION
AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

WINDHAM HILL

ASHFORD AND WILLINGTON, CONNECTICUT





EASTERN CONNECTICUT

RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
WINDHAM HILL
ASHFORD AND WILLINGTON, CONNECTICUT

This report is an outgrowth of requests from the Planning Commissions of Ashford and Willington, with the approval of the owner, the Windham Hill Development Group, to the Soil and Water Conservation Districts (S&WCD) of Windham and Tolland Counties. 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: Albion L. Weeks, C. Donald Summers, District Conservationists, Soil Conservation Service (SCS); Dean Rector, Soil Scientist, SCS; Edwin L. Minnick, Engineering Specialist, SCS; John Cimochowski, David Perkins, Student Biologists, SCS; Dan Meade, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); Huber R. Hurlock, Forester, DEP; Charles L. Phillips, Fishery Biologist, DEP; T.E. Linkkila, Wildlife Biologist, DEP; Andrew Petracco, Recreation Specialist, DEP; Diana J. Marsh, Sanitarian, State of Connecticut Department of Health; Rudy J. Favretti, Landscape Architect, Connecticut Cooperative Extension Service; Lester Barber, Regional Planner, Windham Regional Planning Agency; Barbara Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on September 20, 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 Towns of Ashford and Willington 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.

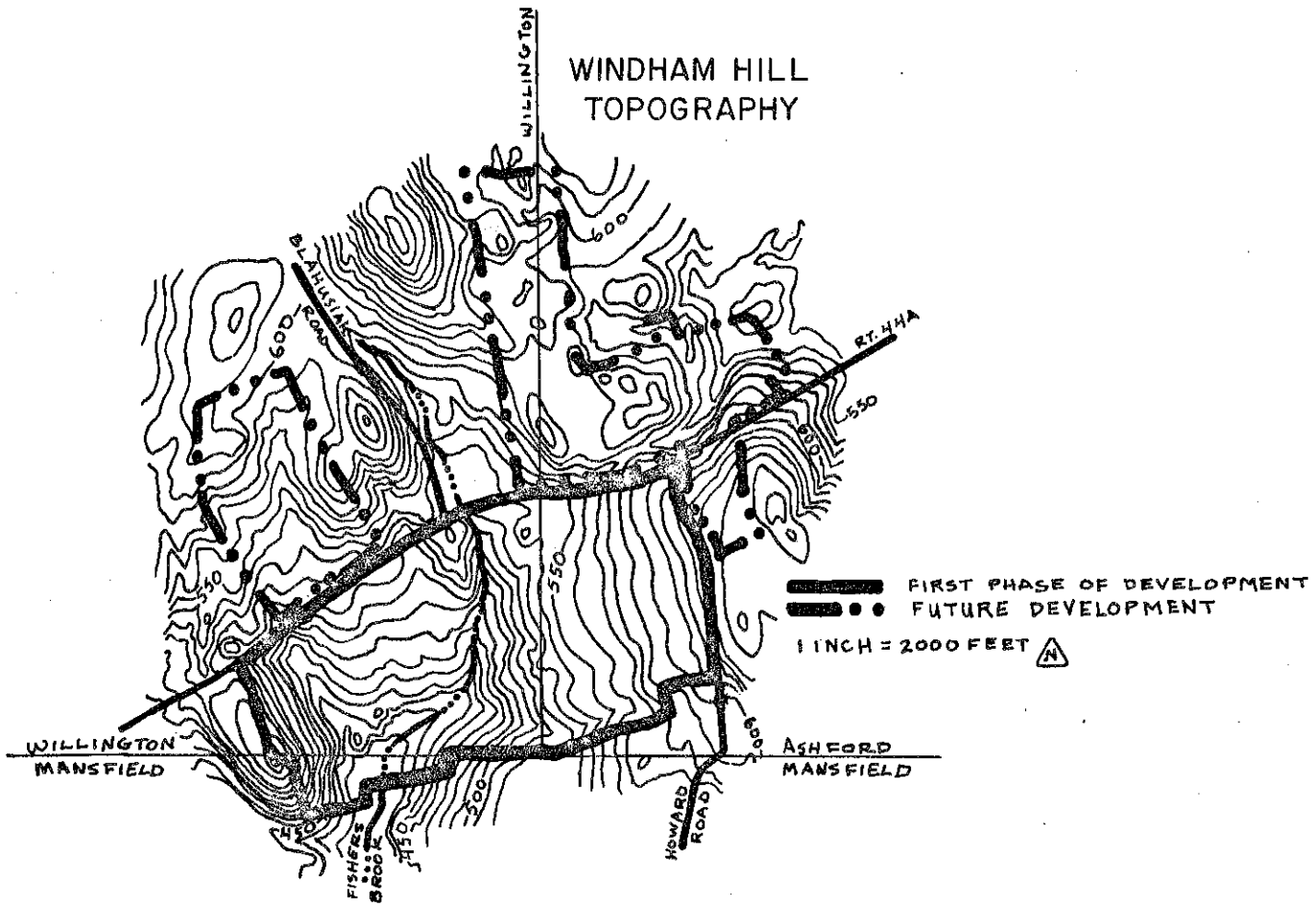
The Eastern Connecticut RC&D Committee hopes you will find

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 Windham Hill development is located on Route 44A in the towns of Ashford, Willington, and Mansfield and encompasses 540 acres. The site is located within the watershed of the Willimantic Reservoir and is upstream of one of the wells of the University of Connecticut. Fishers Brook flows through the Windham Hill property in a southerly direction (see topography map below), then joins the Fenton River which eventually feeds into the Willimantic Reservoir. Being within a water supply watershed, the Windham Regional Guide Plan and the proposed State Plan of Conservation and Development recommend this area for low density, limited development (generally 2 or more acres per dwelling unit).

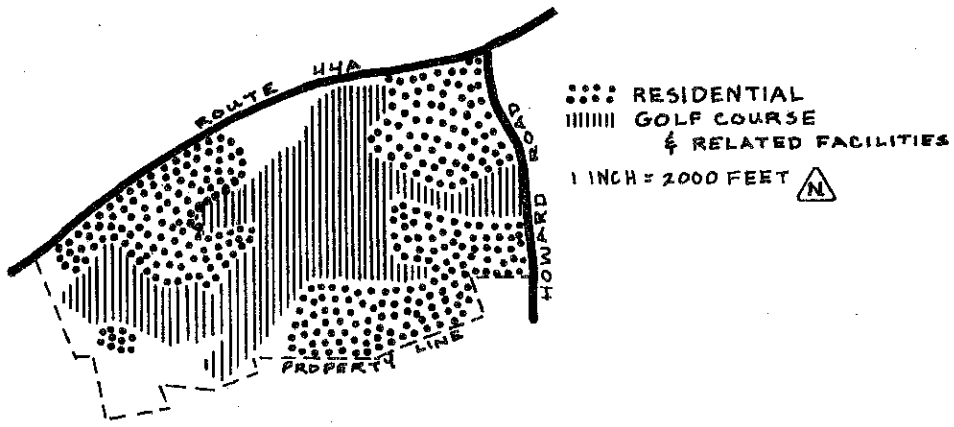


The first phase of the Windham Hill development, with which this report is concerned, covers about 250 acres south of Route 44A and west of Howard Road. The topography map delineates the boundary of the first phase of development from the rest of the tract. Both an 18-hole golf course and mixed residential uses are proposed for the site. The general layout of the site, as proposed in the conceptual plan of development, is shown on the following page. It is anticipated that 135 single-family homes

and apartments will be constructed at a density of one unit per acre of residentially developed land or an overall density of one unit per 1.9 acres.

WINDHAM HILL

PRELIMINARY SCHEME OF DEVELOPMENT
FOR FIRST PHASE



About thirty percent of the soils of the first phase fall under the inland wetlands classification as defined by PA. 155. The golf course, as proposed, overlaps a substantial portion of this area. Besides the regulatory problems of P.A. 155, the extensive and elaborate drainage system and the fill that would be necessary to establish the golf course present serious questions as to the practicality and economic feasibility of the golf course.

In general, the concept of a combined golf course and residential development appears to be a good one. In this particular case, however, the intensity of development proposed for this site should be reevaluated with respect to its location within a water supply watershed and its relation to substantial wetland areas.

EVALUATION

SOILS AND GEOLOGY

The proposed Windham Hill development is situated in the eastern upland region of Connecticut. The geology and hydrology are typical of this part of the state.

The bedrock type underlying the site, although not yet studied in detail and mapped, is thought to be Brimfield Schist, a crystalline rock of metamorphic origin. This formation generally shows great variability locally, in both composition and structure. Typically it is a rusty weathering micaceous schist with very high concentrations of iron and manganese, but may vary to a rock of gneissic composition and structure. The Brimfield is noted mainly for its "rotten" appearance visually and for the poor quality water it yields to bedrock wells.

The unconsolidated or surficial materials overlying the bedrock are till deposits of glacial origin. Till is a predominantly non-sorted, non-stratified material, with particles ranging in size from clay to boulders. In this general area, two types of till occur, one a sandy friable till, the other a clayey compact till. The type of till present along with other factors have a profound effect on drainage and depth to the water table.

In areas underlain by clayey compact till, the rate of ground water flow is minimal, causing the water table to mound in sloped regions. These areas generally have a water table that is at or just below land surface for much if not all year. In areas underlain by sandy friable till the rate of ground water movement is much more rapid and high water table conditions occur for only short periods of time if at all.

A soils survey of the site is included in the Appendix to this report. The soils can be divided into several natural soil groups: B, upland soils over friable to firm glacial till; C, upland soils over compact glacial till (fragipan); D. upland soils that are rocky and shallow to bedrock; F, marsh and swamp soils. Of the two predominant groups, B and C, B is more suitable for development due to its greater permeability. Group D presents difficulties due to its slopes, rockiness, and varying depths to bedrock. Groups F and B-3 have the greatest limitations for development due to a high water table year-round.

Due to the original scale at which the soils are mapped (1"=1,320'), the lines shown on the map should not be construed as precise boundaries, but rather as guidelines to the distribution of soil types on the property. For purposes of detailed site design, a new survey at a scale more suitable to site design (1"=100-200') would be desirable.

A table of limitations for each of the soils for on-site sewage, basements, streets and parking lots, and landscaping, is also given in the Appendix. It is the intention of the table to

call to the attention of the user probable limitations associated with each soil type. 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

As there are no plans at present for municipally supplied water in the area, an on-site water supply will have to be used, either from a community well system or individual on-lot wells. Of the two alternatives, individual wells appear more feasible than a community supply, though both solutions have advantages and disadvantages.

Using a value of 60 gpd (gallons per day) per person for domestic household use of water and assuming a total population in the development of 400 to 500 persons, a community water system would have to supply 25 to 30 thousand gpd. Sustained pumping of a single bedrock or till well in this area would fall short of the projected demand. Therefore, a number of wells would be necessary to develop a community supply. Large apartment complexes in the area have developed from 1 to 5 wells to meet their needs. There should be no particular problem with the location of water transmission lines except for the poorly and very poorly drained soils and occasionally stony conditions that may hamper the installation and maintenance of the system.

A second possibility for a community water system would be a gravel pack well in the sand and gravel area near the Fenton River with the water being pumped to the development. However, the University of Connecticut is presently operating four wells along the Fenton River. Induced infiltration at periods of low flow utilize up to approximately 85% of the surface flow in the Fenton River. Since the Fenton River is being pumped at its capacity by the University of Connecticut and the University has a critical water shortage, it would be inadvisable to install another well along the Fenton River.

Individual wells would have to meet a demand of 200 to 300 gpd, assuming about 4 persons per dwelling unit. Almost all wells located in Brimfield schist have no difficulty whatsoever in meeting this demand. Individual wells should be developed after consideration of the location of sewage disposal systems.

The quality of water derived from Brimfield schist is, however, generally poor and requires treatment to alleviate odor, taste, and visual problems. Various types of filters and/or softeners can improve the overall quality. The Natural Park Apartments, located directly north of the proposed development, have had to install equipment for iron removal.

Water demands other than domestic would include that used for maintenance of the golf course. This water could and should be developed from irrigation ponds either fed by ground water or by Fishers Brook.

WASTE DISPOSAL

No current plans or proposals for expansion or establishment of new public sewer systems envision the extension of service into the watershed area of the Willimantic reservoir. Because public sewers encourage the growth of urban development, the Windham Regional Planning Agency and possibly State environmental and planning agencies would discourage a proposal for such extension. It is recommended that development on a water supply watershed be limited to one unit per two acres of suitable land.

In all probability sewers will not be installed in or near this area for a number of years. Therefore, disposal of domestic sewage will be on-site. Based on the soils map, 30.5 percent of the site has very severe limitations for the installation and operation of septic disposal systems, due to poorly drained soils with a high water table. No systems should be installed in this area.

Another 40.2 percent of the site has severe limitations due to a fragipan, seasonal high water table, and occasional steep slopes and stoniness. Because of the low permeability of the compact tills (fragipan), a curtain drain system would have to be extensive in order to be effective in altering the drainage. Larger lots may need to be considered in some cases to allow adequate space for the location of both the drainage and septic systems, particularly if on-lot wells are also contemplated. With the control of surface drainage and the possible need for filling, the costs of installing these septic systems will be considerably above average.

The remaining 29.3 percent of the site is more conducive to the proper functioning of a septic system and should not require extensive site design and preparation.

Development of any lot will depend on depth to groundwater, fragipan, and/or ledge, and the percolation rate of the soil. It is strongly recommended that a detailed soils map of the property at a scale suitable for design be provided along with observation pits and percolation tests in the areas of the proposed sewage disposal systems. Care should be taken in the location and design of the systems, so as to avoid widespread failure of systems which could adversely affect the Fenton River.

For solid waste, the Ashford landfill may provide sufficient disposal facilities. Willington is currently under orders to establish a new disposal site due to the location and lack of space

at the existing site. Recycling facilities for glass and newspapers would be desirable and should be established in this community.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

Based on the soils map, over 60 percent of the area has severe to very severe limitations for the construction of homes with basements. The major restriction is a seasonal or year-round high water table. A considerable amount of drainage would be required to insure against flooded cellars.

Also based on the soils map, over 70 percent of the area has severe to very severe limitations for landscaping (or fairways). The predominant reasons are seasonal or year-round high water table, stoniness, and steep slopes. To render the proposed golf course usable during the normal playing season will require a substantial amount of surface and subsurface drainage.

The problems of erosion and sedimentation are ones present in all forms of development, particularly when watercourses are adjacent. An erosion and sedimentation control plan should be developed before the start of construction. In particular, sedimentation ponds should be constructed to prevent sediment from reaching Fishers Brook. An increase in silt load could adversely affect the University well that is downstream of Windham Hill by reducing the efficiency of induced infiltration of water from Fenton River to the aquifer. Other types of erosion control include debris basins, waterways and diversions, and temporary and permanent seedings. The Erosion and Sediment Control Handbook for Connecticut, published by the State office of the Soil Conservation Service, provides standards and specifications for these and other erosion control measures. The handbook is available at Soil Conservation Service offices.

ROADS AND UTILITIES

Route 44A and Howard Road are the only existing roads that presently afford access to the property. Route 44A appears to be capable of handling the additional traffic which might be generated by the new development. The limiting of the access points from the development onto the highway is desirable and should be maintained in any subsequent alterations or refinements on the plans. Traffic congestion may develop at the intersections with Route 44A.

The generation of large amounts of traffic onto Howard Road should be discouraged due to its dangerous intersection with Route 44A. The plan as presently designed indicates that a large number of homes on the Ashford side of the development might be serviced by Howard Road. More convenient access to Route 44A would be preferable.

As indicated by the soils map, 68.5 percent of the area has severe to very severe limitations for construction of streets and parking lots, again due mainly to the wet conditions. Unless adequate drainage is installed, difficulty can be expected not only during construction, but also in future maintenance. Careful attention should be given to interior road specifications by Ashford and Willington to assure that steps are taken to prevent the danger of street breakup and other drainage problems.

GOLF COURSE

It does not appear practical or economically feasible to install a golf course as now proposed. A substantial portion of the golf course is located on poorly or very poorly drained soils that are designated as inland wetlands under P.A. 155. To develop a golf course that skirts a wetland could be both feasible and practical, but to develop a golf course through a wetland presents severe drainage and runoff problems that would be costly to correct. It should also be noted that fill over the wetland would also quickly become saturated unless the area is under-drained correctly.

It was understood that another golf course is proposed for an area several miles east of the Windham Hill development. This should be taken into account when evaluating the economic feasibility of this golf course.

Other major recreational development of this tract would be precluded by development of the drier upland portions of the site for housing, though recreational facilities on a smaller scale might be considered. The parklet or mini-park concept could be given consideration for incorporation in the residential areas. However, with the rural nature of the area and a low density development, this might not be necessary. One other alternative would be to eliminate housing on the tract and develop the golf course, and possibly other recreational uses, on the drier land.

HAZARDS

Natural. There is an abundance of poison ivy growing in the area. This poses a health hazard to both construction workers as well as future residents.

The wetlands are possible breeding areas for mosquitoes.

Man-made. The environmental effect of draining the wetland to accommodate a golf course is a question that should be answered if the plans proceed. Of particular concern would be the effect on the University well field and the Willimantic Reservoir.

AESTHETICS AND PRESERVATION

The Windham Hill site has many aesthetic features, such as a meandering brook, boulders and rock outcroppings, groves of hemlock, pines, and oaks, fields, stone walls, and several fine vistas. The proposed residential use would be compatible to the site except that the proposed density is too great for the existing soil conditions. Greater respect for the existing soil conditions would permit a reduction in the density and revisions in the plans to insure preservation of the features noted above. In general, a golf course-housing development is a sound concept, but in this particular case the limitations of the soils make the feasibility of the golf course questionable.

Forestry. This site is not suited for commercial forestry. There are not enough trees ten inches in diameter and up to consider timber salvage in developing the site.

Roots of existing woody vegetation are confined to a small layer of soil above the water table and would be killed by any increase in the water table during development. Fill or soil compaction would also kill trees in the immediate area. To insure survival of trees not in the active area of construction, buffer strips 60 to 100 feet wide should be preserved.

Wildlife. The area has low populations of deer, rabbits, squirrels, grouse, woodcock, and other animals. The present habitat includes wetlands, old fields, and wooded areas. Numerous valuable wildlife shrubs are found throughout the area. However, the condition of the area has degraded with the maturity of the overstory, so that its present wildlife value is low. The area has excellent potential, though, and improvement of the habitat would result in an increase in wildlife population. The land is located close enough to population centers so that if it were open space, it would get maximum use.

Fish. The fish population of Fishers Brook cannot be very large, since the brook appears to run dry during the summer. However, the drainage and/or filling required to establish the proposed golf course would damage an important wetland in the Fenton River watershed and block or retard drainage from additional wetlands to the north. Since the Fenton River drainage is already being tapped by University of Connecticut wells, the system can ill support the loss of a wetland of this size which feeds the Fenton below three of the four University wells.

SERVICES TO SUPPORT DEVELOPMENT

Services required of the towns will be essentially external to the development in terms of school facilities, police and fire protection, and expanded use and wear on town roads. The burden to which the towns are placed will depend on the speed with which the homes are built. Being divided by town and county lines, the

development will necessitate double services. Shopping facilities are available in the area and will not require expansion to service this development.

COMPATIBILITY OF SURROUNDING LAND USES

Surrounding land use is essentially rural agricultural and scattered single family dwellings. Large scale subdivisions have not been typical of this area, but the low housing density does not make it clearly out of place. Being within a water supply watershed, however, would make a lower density desirable. A density of one unit per two acres or more of suitable land is recommended. Any subdivision of the proposed size will reduce the rural characteristic of the area.

ALTERNATIVE LAND USES FOR THE AREA

Alternative uses for the area that would be compatible include agriculture and/or an open space-wildlife management area. The soils are basically better adapted to agriculture than to urban usage. The possibility of exclusive recreational use on the more favorable land was mentioned earlier.

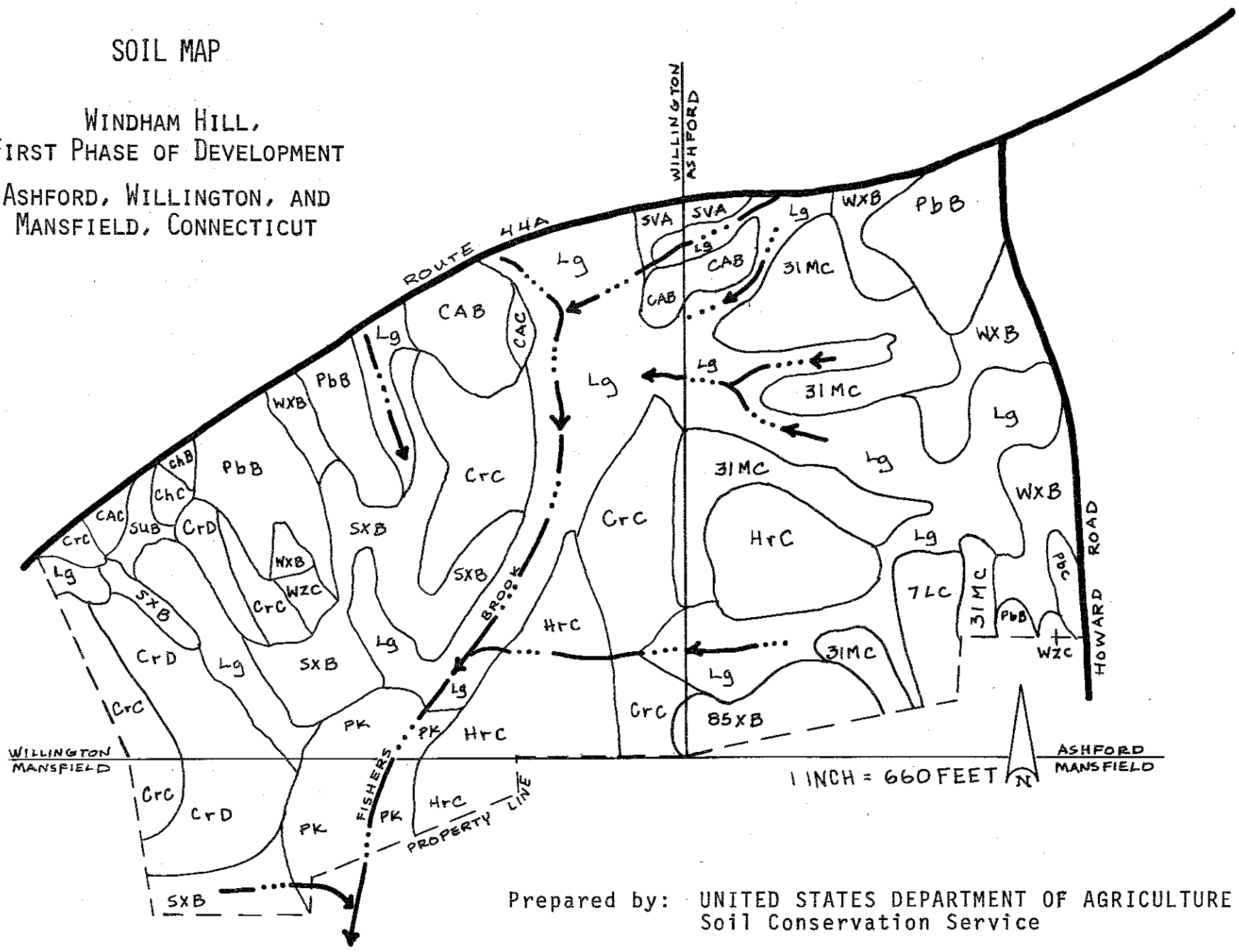
Higher residential densities or more intensive urban uses would not be desirable.

APPENDIX

SOIL MAP

WINDHAM HILL,
FIRST PHASE OF DEVELOPMENT

ASHFORD, WILLINGTON, AND MANSFIELD, CONNECTICUT



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Soil Conservation Service

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WINDHAM HILL, FIRST PHASE OF DEVELOPMENT

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-1a	CaB, ChB	14.5	5.5	1	1	1	2	Slope 3-8%
B-1b	CaC, ChC	3.0	1.1	2	2	3	2	Slope 8-15%
B-1c	CrC	36.0	13.6	2	2	3	3	Stoniness, slope 3-15%
B-1e	CrD	17.3	6.5	3	3	3	3	Stoniness, slope 15-35%
B-2a	SvA, SvB	3.0	1.1	2	2	2	2	Seasonal high water table
B-2b	SxB	18.2	6.9	3	3	2	2	Seasonal high water table, stoniness, slope 3-15%
B-3b	Lg	69.9	26.4	4	4	4	4	High water table
C-1a	85XB, PbB	21.1	8.0	2	1	1	2	Fragipan, slope 3-8%
C-1b	PbC	1.0	.4	3	2	1	3	Fragipan, slope 8-15%
C-2a	WxB	16.7	6.3	3	2	2	2	Seasonal high water table, fragipan, stoniness
C-2b	7LC, 31MC, WzC	29.8	11.2	3	3	3	3	Fragipan, slope 3-15%, seasonal high water table
D-1	HrC	23.5	8.9	3	3	3	3	Shallow to bedrock, slope 3-15%
F-1	PK	11.0	4.1	4	4	4	4	High water table, organic material
		265.0	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

WINDHAM HILL, FIRST PHASE OF DEVELOPMENT

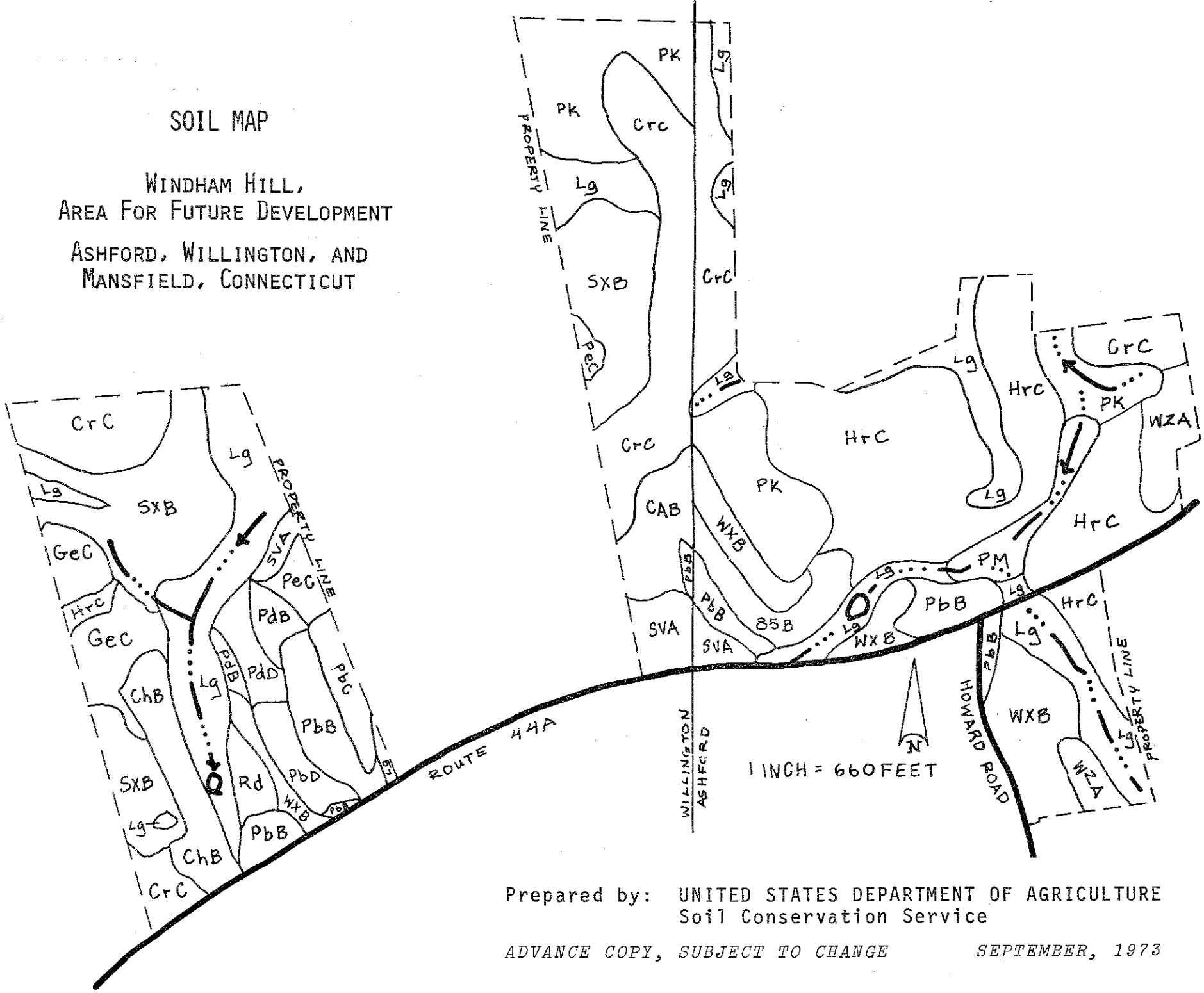
ACREAGE SUMMARY OF SOILS LIMITATIONS

	Slight		Moderate		Severe		Very Severe	
	Acres	%	Acres	%	Acres	%	Acres	%
On-Site Sewage	14.5	5.5	63.1	23.8	106.5	40.2	80.9	30.5
Basements	35.6	13.5	59.7	22.5	88.8	33.5	80.9	30.5
Streets and Parking Lots	-	-	83.2	31.5	100.9	38.0	80.9	30.5
Landscaping	36.6	13.9	37.9	14.3	109.6	41.3	80.9	30.5

SOIL MAP

WINDHAM HILL,
AREA FOR FUTURE DEVELOPMENT

ASHFORD, WILLINGTON, AND
MANSFIELD, CONNECTICUT



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WINDHAM HILL, AREA FOR FUTURE DEVELOPMENT

SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Limitations for: ** On-Site Sewage	Basements	Landscaping	Streets and Parking	Principal Limiting Factor
A-3b	PM	4	4	4	4	High water table
B-1a	CaB, ChB	1	1	1	2	Slope 3-8%
B-1c	CrC, GeC	2	2	3	3	Slope 3-15%
B-2a	SvA	2	2	2	2	Seasonal high water table
B-2b	SxB	3	3	2	2	Stoniness, slope 3-15%, seasonal high water table
B-3b	Lg	4	4	4	4	High water table
C-1a	PbB, PdB, 858	2	1	1	2	Fragipan, slope 3-8%
C-1b	PbC	3	2	1	3	Fragipan, slope 8-15%
C-1c	PeC	3	2	3	3	Fragipan, slope 8-15%, stoniness
C-1d	PbD, PdD	3	3	3	3	Fragipan, slope over 15%
C-2a	WxB	3	2	2	2	Fragipan, seasonal high water table
C-2b	WzA	3	3	3	3	Fragipan, stoniness, seasonal high water table
D-1	HrC	3	3	3	3	Shallow to bedrock, slope 3-15%
F-1	PK	4	4	4	4	High water table, organic material

* 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