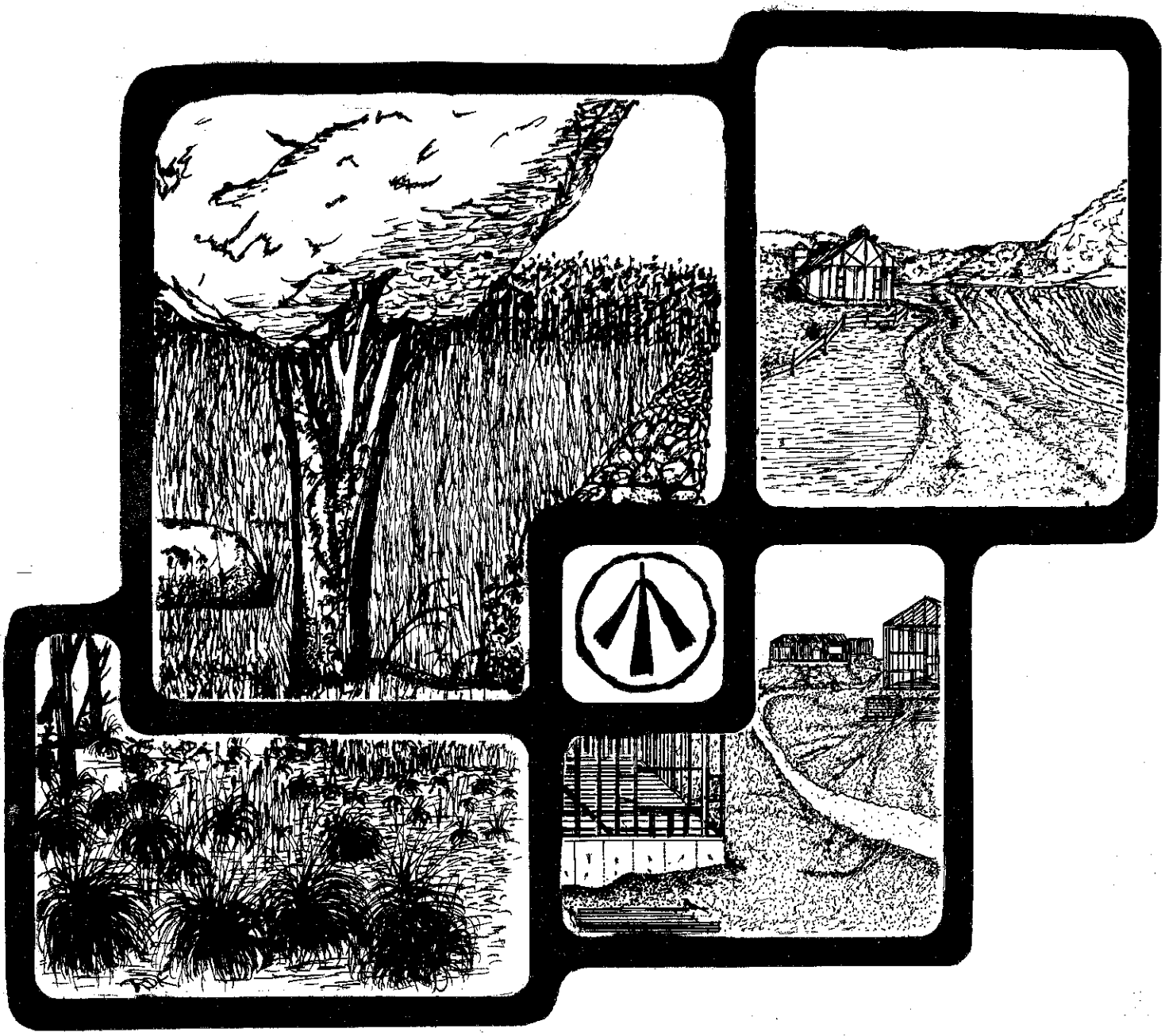
ENVIRONMENTAL REVIEW TEAM REPORT



SHELDON CLUSTER SUBDIVISION
WARREN, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION AND DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

On

SHELDON CLUSTER SUBDIVISION
WARREN, CONNECTICUT

OCTOBER 1979

King's Mark Resource Conservation & Development Area

Environmental Review Team

P.O. Box 30

Warren, Connecticut 06754

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team operates through the cooperative effort of a number of agencies and organizations including:

Federal Agencies

U.S.D.A. SOIL CONSERVATION SERVICE

State Agencies

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEPARTMENT OF HEALTH
DEPARTMENT OF TRANSPORTATION
UNIVERSITY OF CONNECTICUT COOPERATIVE EXTENSION SERVICE

Local Groups and Agencies

LITCHFIELD COUNTY SOIL AND WATER CONSERVATION DISTRICT
NEW HAVEN COUNTY SOIL AND WATER CONSERVATION DISTRICT
HARTFORD COUNTY SOIL AND WATER CONSERVATION DISTRICT
FAIRFIELD COUNTY SOIL AND WATER CONSERVATION DISTRICT
NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY
VALLEY REGIONAL PLANNING AGENCY
LITCHFIELD HILLS REGIONAL PLANNING AGENCY
CENTRAL NAUGATUCK VALLEY REGIONAL PLANNING AGENCY
HOUSATONIC VALLEY COUNCIL OF ELECTED OFFICIALS
AMERICAN INDIAN ARCHAEOLOGICAL INSTITUTE

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Staff Administration Provided By

NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY

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Richard Lynn, ERT Coordinator
Rebecca West, ERT Draftsman
Irene Nadig, Secretary

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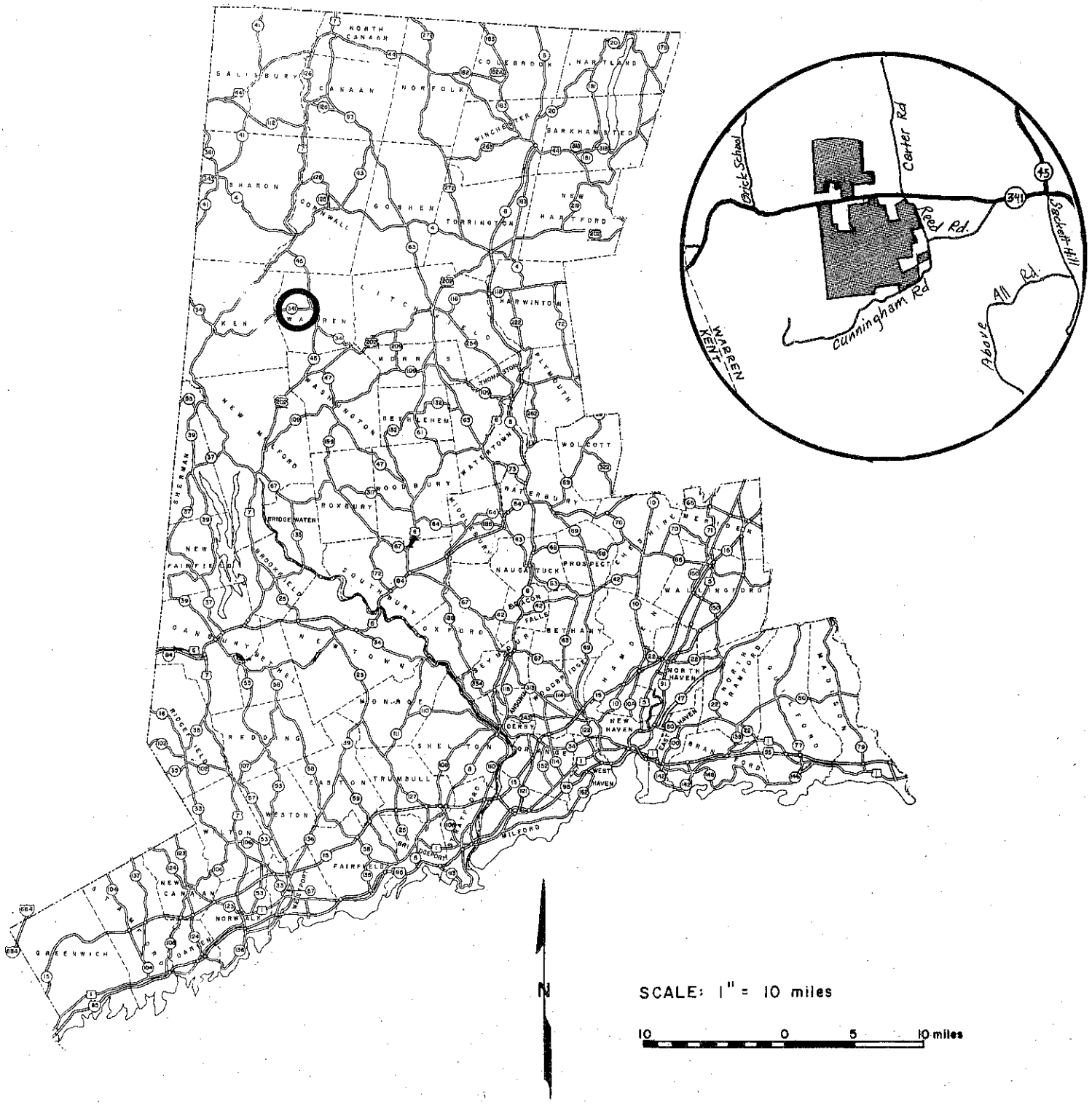
WARREN, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT
ON
SHELDON CLUSTER SUBDIVISION
WARREN, CONNECTICUT

I. INTRODUCTION

The Town of Warren, Connecticut is presently reviewing an application for cluster subdivision of ± 285 acres of land. The subject site is located in the west-central portion of town astride Route 341.

The proposed plan for the "Sheldon Cluster Subdivision" calls for 139 one acre lots and ± 124 acres of open space (see Figure 1). Several interior roads are proposed to provide access to the parcel off Cunningham Road, Reed Road, and Route 341. Domestic water supply is proposed to be provided by on-site wells. Sewage disposal is proposed to be handled by septic systems.

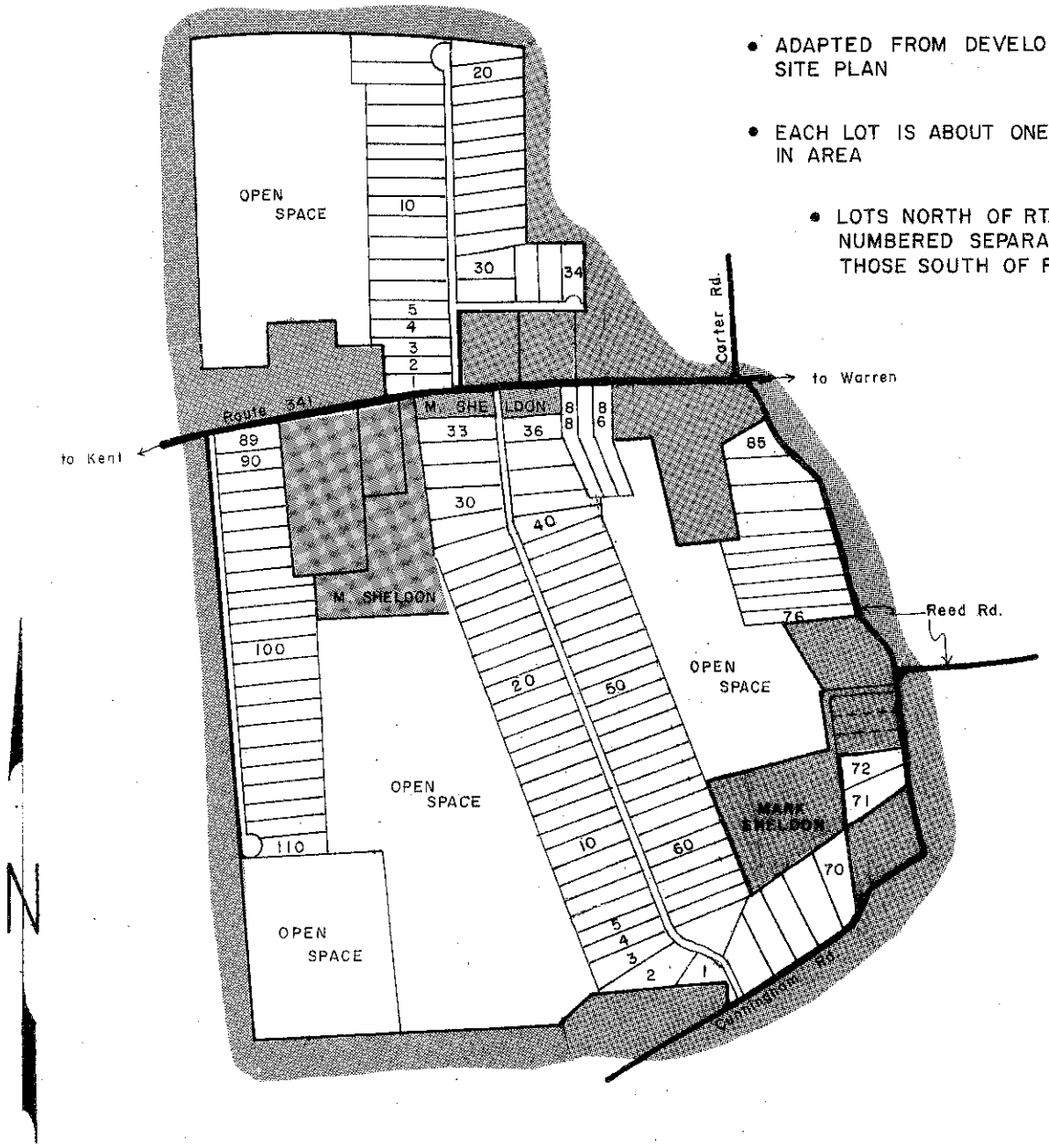
The Planning and Zoning Commission from the Town of Warren requested the assistance of the King's Mark Environmental Review Team (ERT) to help the town in analyzing the proposed development. Specifically, the ERT was asked to identify the natural resources of the site and to highlight opportunities and limitations for the proposed land use. Major concerns raised by the town in requesting this review included the impact of the project on soils, storm water runoff, wetlands and traffic.

The ERT met and field reviewed the site on August 15, 1979. Team members for this review consisted of the following:

Alan Buzzetti	Sanitarian	State Department of Health
Mallory Gilbert	Soil Conservationist	U.S.D.A. Soil Conservation Service
Dick Henry	Executive Director	Lake Waramaug Task Force
Steve Jackson	Wildlife Biologist	State Department of Environmental Protection
Lee Markscheffel	Regional Planner	Northwestern Connecticut Regional Planning Agency
Edmond Zaglio	Forester	State Department of Environmental Protection
Michael Zizka	Geohydrologist	State Department of Environmental Protection

FIGURE I.

SIMPLIFIED SITE PLAN



SCALE: 1" = 1000'

0 1/4 1/2 mile

0 1000' 2000' 3000'

Prior to the review day, each team member was provided with a summary of the proposed project, a checklist of concerns to address, a detailed soil survey map, a soils limitation chart, a topographic map, and a simplified site plan of the development proposal. Following the field review, individual reports were prepared by each team member and forwarded to the ERT Coordinator for compilation and editing into this final report.

This report presents the team's findings and recommendations. It is important to understand that the ERT is not in competition with private consultants, and hence does not perform design work or provide detailed solutions to development problems. Nor does the team recommend what ultimate action should be taken on a proposed project. The ERT concept provides for the presentation of natural resources information and preliminary development considerations--all conclusions and final decisions rest with the town and developer. It is hoped the information contained in this report will assist the Town of Warren and the landowner/developer in making environmentally sound decisions.

If any additional information is required, please contact Richard Lynn, (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P. O. Box 30, Warren, Connecticut 06754

* * * * * *

II. SUMMARY

- Development of the property as planned would increase run-off volumes and peak flows from the site. Although peak flow increases are not expected to exceed 10 percent for major storm events, great care should nonetheless be taken to control stormwater runoff from the site to prevent erosion and sedimentation.

- Bedrock is the most likely source of water supply for domestic wells on this property. Yields from bedrock based wells are difficult to predict, however an assessment of presently established bedrock wells indicates that most of the proposed wells would probably yield enough water to meet the needs of an average family. The initial quality of groundwater is expected to be good. Much care should be used in the design of septic systems in shallow to bedrock areas however to insure that poorly treated septic effluent does not contaminate groundwater.

- The majority of the wetlands mapped on the property are identified as "flood hazard areas" by the Department of Housing and Urban Development Flood Hazard Boundary Maps. Although the proposed subdivision plan leaves most of these flood hazard areas as open space, it appears that lots 16-30 and lots 86-88 may infringe upon these areas.

- According to the criteria of the U.S.D.A. Soil Conservation Service, over 90% of this site has severe limitations for residential development. Major limiting factors include inland wetland soils, steep slopes and shallow to bedrock conditions. These factors present major problems for septic system operation, homesite and driveway construction, and landscaping.

- Due to the presence of soil inclusions on the property (some more limiting, some less limiting), it is recommended that the developer contact a private soils scientist to do a detailed soils mapping of the parcel. Such detailed mapping would more clearly define those unfavorable soil areas which should be avoided during development, and would also highlight those areas where development is much more feasible. Any development plans for this property should include a comprehensive erosion and sediment control plan.

- The Sheldon property consists predominantly of mixed hardwood forest and swamp with lesser amounts of open land and mixed hardwood/softwood forest. Black spruce or red spruce were observed growing in the largest swamp on the site. Both species are listed as "rare" in Connecticut and efforts should be made to protect and preserve these trees.

- The subject site offers good habitat for many species of wildlife. The proposed development would have a significant negative impact on existing wildlife populations due to loss of habitat and increased human presence in the area.

- Existing information and the results of the ERT's on-site field investigation indicate that the majority of the site presents severe limitations for on-site subsurface sewage disposal. Major limiting factors include shallowness to bedrock, steep slopes, and wetness. Deep observation pits and percolation tests should be conducted on each lot to conclusively determine their suitability for septic systems. Preliminary analysis indicates that major portions of the site proposed for development are <u>not</u> suitable for subsurface sewage disposal systems.

- *It is anticipated that the 139 lot development would generate between 1,390 and 1,473 vehicular trips per day on Route 341. This would more than double the traffic on this section of Route 341 according to 1977 estimated traffic counts. Route 341 should be able to handle this additional load however as the maximum rated capacity of this road is 2,000 vehicles per hour.*

- *It is anticipated that 330 additional residents including 79 school age children could be expected because of the development. It appears that the present schools serving the area would be able to absorb the additional students.*

- *Much of the subject property south of Route 341 falls within the Lake Waramaug watershed. To be consistent with the Lake Waramaug Watershed Management Plan: no construction should occur in or within 150 feet of any wetlands or watercourses; every effort should be made to control erosion and sedimentation during and after construction; septic systems should be designed to meet State health codes and also to assure complete phosphorous attentuation of septic system effluent. It is suggested that water quality testing be performed at the site both before and during any residential development of this property to ensure that water quality is not degraded.*

III. GENERAL SITE CONDITIONS

The ± 285 acre "Sheldon Cluster Subdivision" site is located about one mile west of the center of town. The property is irregularly shaped and has frontage on Route 341, Reed Road, and Cunningham Road.

Most of the property is wooded. Some acreage of open fields still remain, but this is gradually being overgrown. The topography of the tract is diverse and varies from steep to nearly flat (see Figure 2). The steeper portions of the property have numerous bedrock outcrops. Approximately 90 acres of the parcel has been identified as inland wetlands.

IV. GEOLOGY

The Sheldon property is located along the western boundary of the New Preston topographic quadrangle and the eastern boundary of the Kent quadrangle. A bedrock map (Connecticut Geological and Natural History Survey Miscellaneous Series No. 5, by R. M. Gates and W. C. Bradley, 1952) and a surficial geologic map (U. S. Geological Survey Map GQ-782, by R. B. Colton, 1969) of the New Preston quadrangle have been published. Geologic maps of the Kent quadrangle are not yet published but are on open-file at the Natural Resources Center, Department of Environmental Protection, in Hartford.

The bedrock underlying and cropping out on the Sheldon site appears to consist largely of mica-quartz gneisses and schists, feldspathic mica quartzites, and mica quartzites. Essential minerals are quartz, plagioclase, muscovite, and biotite. Other common minerals include garnet, microcline, ipidote, zoisite, sillimanite, magnetite, and apatite. Overlying the bedrock is a generally thin blanket of nonsorted, nonstratified rock particles. This material is known as till and was deposited directly from glacier ice, which formerly occupied the area. The texture of the till is loose and sandy in most places. On much of the site, till or bedrock is overlain by swamp deposits. These consist of grayish-brown peat and muck mixed or interbedded with sand, silt, and clay. The surficial geology of the site is shown in Figure 3.

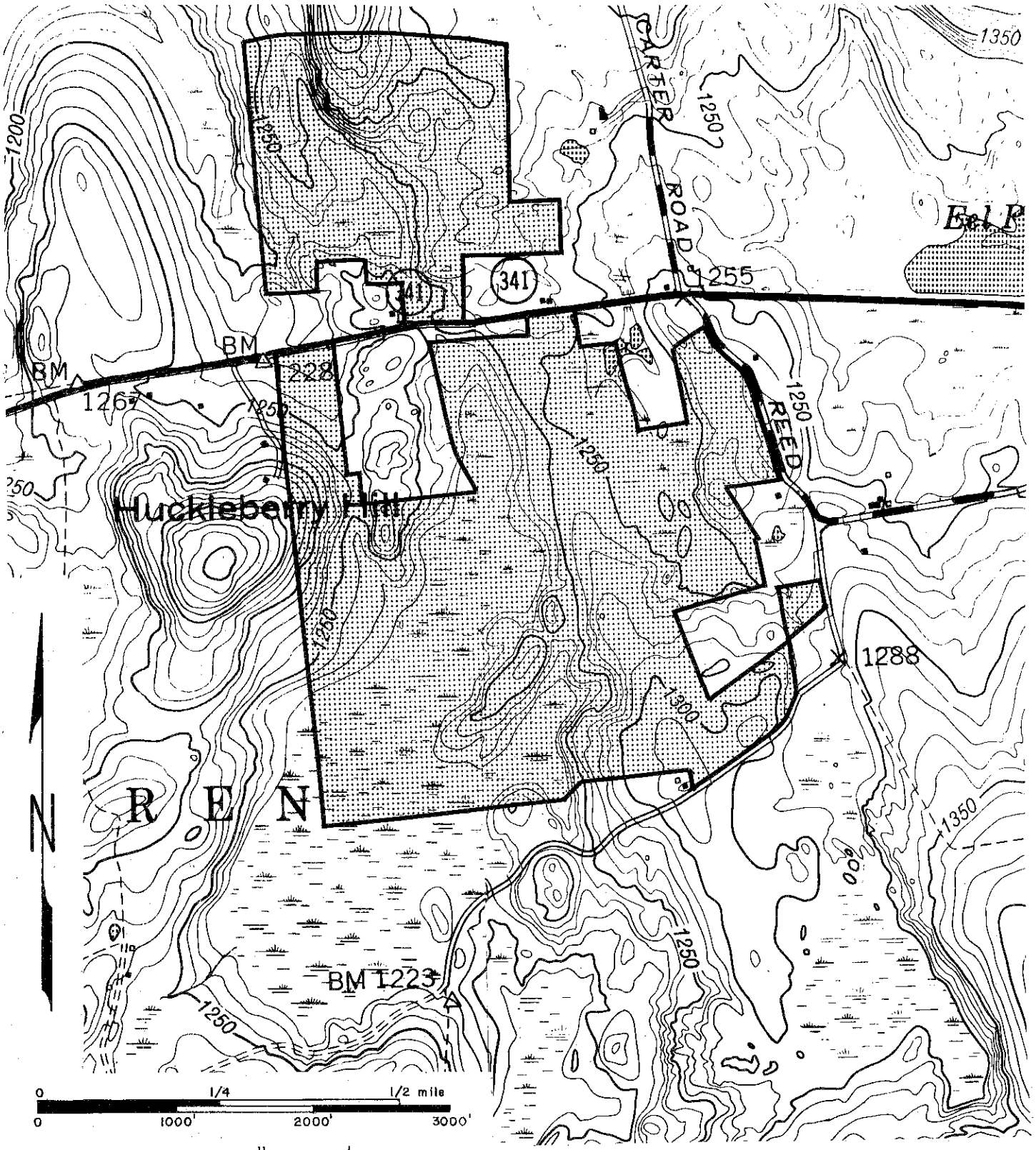
V. HYDROLOGY

Runoff from the site flows into three principal drainage lines. The western part of the section south of Route 341 drains into the western arm of Lake Waramaug, via an unnamed brook; the eastern part of the section south of Route 341 drains into the eastern arm of Lake Waramaug via Waramaug Brook (Sucker Brook); and most of the northern section drains into Housatonic River via Kent Falls Brook. Development of the property as planned would affect the hydrology of all three streams. Runoff volumes from the site for given rainfall amounts would increase, causing an increase in peak flows in the local streams. The percentage increases in peak flows would be greatest near the site, diminishing gradually downstream.

Peak flows for certain storm events (such as the 25-year, 24-hour storm) may be estimated by a method described in Technical Release No. 55 of the Soil Conservation Service. A simplified version of that method was used to estimate peak flows at two design points for three different storms, both before and after development.

FIGURE 2.

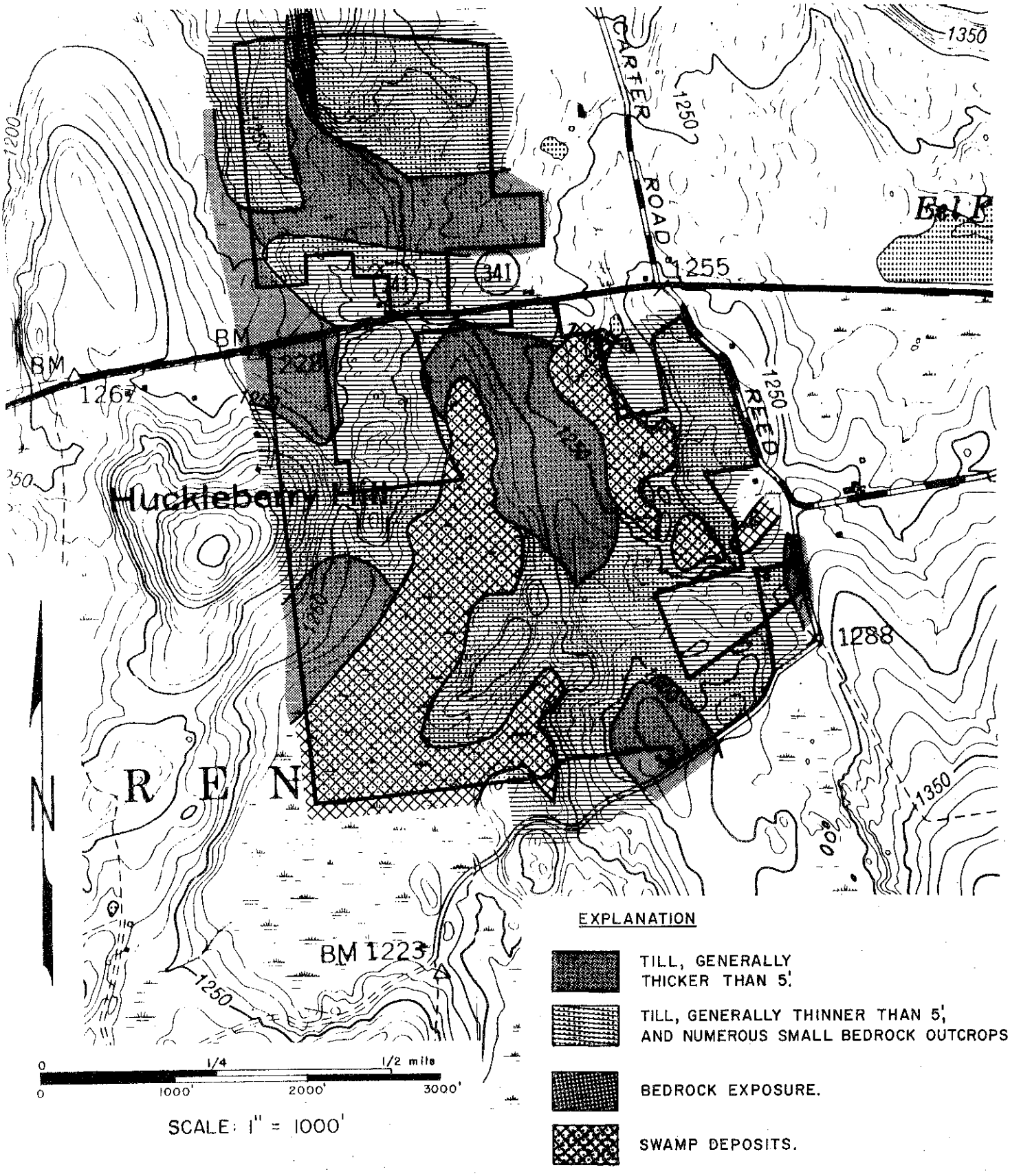
TOPOGRAPHIC MAP



SCALE: 1" = 1000'

FIGURE 3.

SURFICIAL GEOLOGY



The two design points and their corresponding watersheds are shown in Figure 4. Both points chosen represent culverts through which runoff from the western and eastern sections of the property, respectively, first passes under a road. A design point was not chosen, nor runoff calculations made, for the northern section of the site. This area falls in a watershed of approximately 915 acres, of which only about 25 acres (less than 3 percent) would be developed under the current plan. Peak-flow increase from the development would therefore be insignificant in this area.

Results of the calculations for the two design points are given in Table 1. The accuracy of the flow estimates may be only "ballpark", but the calculated percentages of increase should be fairly close.

Table 1. Peak flows for before-development and after-development conditions at the two design points shown in Figure 4. All flows given in cubic feet per second (cfs).

	Design Point 1		
	25-year, 24-hour storm	50-year, 24-hour storm	100-year, 24-hour storm
Before development	320	423	699
After development	346	452	736
Percent increase	8%	7%	5%

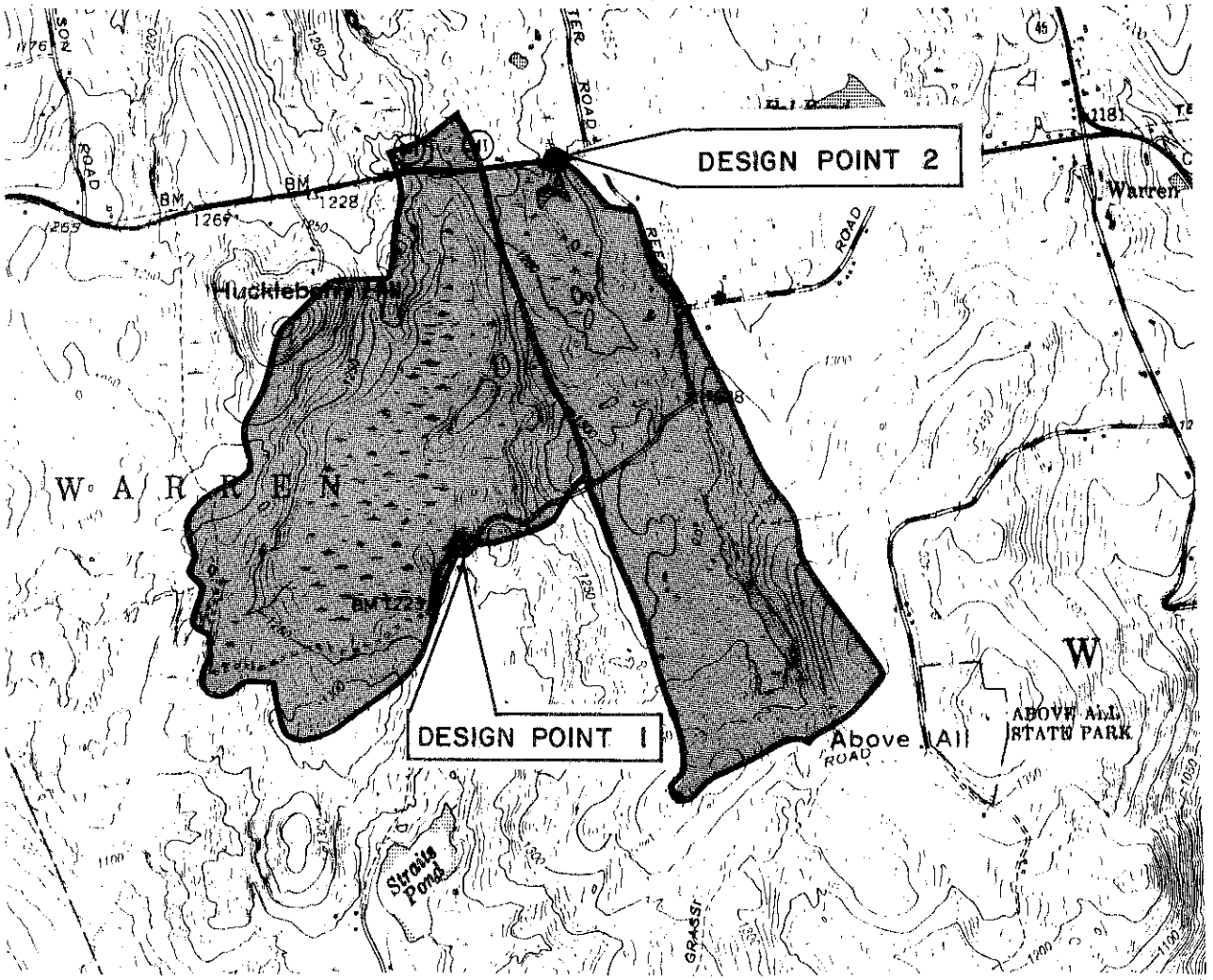
	Design Point 2		
	25-year, 24-hour storm	50-year, 24-hour storm	100-year, 24-hour storm
Before development	211	270	440
After development	228	290	467
Percent increase	8%	7%	6%

None of the above calculated peak flow increases exceeds 10 percent. The moderate level of the increases may be explained by the relatively large amount of open space that would be left following development. In addition, the peak flows listed for after-development conditions do not take into account possible piping or other channeling of runoff, which would also increase the flows to some extent.

It should be pointed out that on-site runoff rates in the developed areas themselves may increase much more than 10 percent. For this reason, as well as the fact that development of the site would involve moderate to steep slopes and cutting and filling operations in some areas, a conscientious sediment-and-erosion control plan should be developed and followed with full consideration given to stormwater management.

FIGURE 4.

DESIGN POINTS AND WATERSHEDS FOR DRAINAGE CALCULATIONS IN TEXT



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SCALE: 1" = 2000'

0 1/2 1 mile

0 2000' 4000' 6000'

It should also be pointed out that the majority of the wetland areas mapped on the property are identified as "flood hazard areas" by the Department of Housing and Urban Development's Flood Hazard Boundary Maps. Although the proposed subdivision plan leaves most of these "flood hazard" areas as open space, it appears that lots 16-30 and lots 86-88 may infringe upon these areas.

VI. WATER SUPPLY

Water supplies to homes within the proposed subdivision are proposed to be provided by individual wells. Since no extensive sand and gravel deposits appear to exist within the site, bedrock would be the most likely aquifer to be tapped. Yields from bedrock-based wells are difficult to predict; they depend upon the number and size of water-bearing fractures encountered, the geographic locations of the wells, and other factors. Nevertheless, an assessment of presently established bedrock wells allows one to predict the chances for any new well to achieve certain minimum yields. In Connecticut Water Resources Bulletin No. 21, 734 bedrock-based wells in the upper Housatonic River basin were analyzed. The results indicate that 80 percent of the wells that tapped a rock type similar to the bedrock underlying the site yielded 3 gallons per minute or more; 65 percent yielded 5 gpm or more; 35 percent yielded 10 gpm or more; and only 15 percent yielded 20 gpm or more. A yield of 3 gpm is considered adequate to meet the needs of an average family.

The initial quality of the groundwater may be expected to be good. Although one well in the vicinity of the site produced water with an undesirably high concentration of manganese, the general groundwater quality of the area is high. Much care should be used in the design of septic systems in the shallow-to-bedrock parts of the site in order to assure that poorly treated septic effluent does not contaminate the groundwater.

VII. SOILS

A detailed soil survey map and soils limitation chart of the tract is presented in the Appendix of this report. The soils map illustrates the geographic location of all soils identified on the property. The soils limitation chart identifies limiting factors for various land uses on individual soil types and also rates the severity of these limitations as determined by the U.S.D.A. Soil Conservation Service.

Basically there are ten major soil types on the property. A brief description of each of these soils is presented below. Figure 5 shows the location of these major soil types, with all inland wetland soils combined as one type (see soils map in Appendix for delineation of individual wetland types).

*Birdsall Soils: The Birdsall soil series consists of level or slightly depressional, non acid, very poorly drained soils which developed in deposits of silt and very fine sand. They have a water table at or near the surface in winter and spring. Their potential for all development related activities is severe. Their best possible use is as wildlife habitat.

FIGURE 5.

MAJOR SOIL TYPES

ADAPTED FROM LITCHFIELD COUNTY SOIL SURVEY, U.S.D.A. – S.C.S.

Charlton Soils: The Charlton series consists of deep, well drained, nearly level, or undulating to hilly soils that developed in friable to firm glacial till. These soils are well distributed on uplands throughout Litchfield County. They are stony to very stony on about two-thirds of their total acreage. Permeability is moderate to moderately rapid throughout. These soils are classified as fine sandy loam. Except where slope and stoniness are problems, they are well suited for homesites, landscaping, septic fields and roads.

Hollis Soils: The Hollis series consists of well-drained or somewhat excessively drained, gently sloping to steep soils that are very shallow or shallow over crystalline bedrock. These soils developed in a thin mantle of glacial till with the underlying residuum derived from bedrock. The general development rating for this soil type is severe.

*Leicester, Ridgebury and Whitman: This undifferentiated unit is made up of poorly and very poorly drained soils. All of these soils are nearly level. Stones and excess water make them unsuitable for development. These soils do, however, offer good potential as habitat for wetland wildlife.

Paxton Soils: The Paxton series is made up of well-drained soils that developed in glacial till. These soils have a compact layer at a depth of about 2 feet. They are moderately permeable in the surface layer and subsoil but slow to very slow in the substratum. Most use limitations are associated with slow percolation rates, seasonal wetness, and large stones. Some engineering modifications may be needed for foundation placement, septic fields and road construction.

*Peat and Muck Soils: (Pk) Peat and Muck consist of organic deposits in bogs and swamps, where the water table is at or near the surface most of the year. The deposits range in depth from 3 to more than 25 feet. These soils are rated severe for all development related activities. They often provide excellent wildlife habitat if flight ways for water fowl can be provided.

The shallower muck soils (Pm) are somewhat similar to the Pk soils with the exception that they are well decomposed organics which do not run deeper than 36 inches.

*Rumney Soils: The Rumney soil series consists of poorly drained soils that developed in areas subject to frequent flooding. Their development potential is severe.

Sutton Soils: The Sutton series consists of moderately well drained, nearly level to sloping soils that developed in glacial till of late Wisconsin age. The till was derived mainly from schist but included varying amounts of granite and gneiss. Their permeability is moderate or moderately rapid. Seasonal wetness may be a problem.

*Whitman Soils: The Whitman series consists of very poorly drained, nearly level soils that occupy uplands. They developed in glacial till of late Wisconsin age. The till was derived mainly from schist, gneiss, and granite. These soils occur in low-lying, small to medium-sized areas, where they receive runoff and, in places, material washed from surrounding soils. Their permeability is moderate. These soils in their native state are unsuitable for development.

* Wetland soil as defined by P.L. 155, as ammended

Woodbridge Soils: The Woodbridge series consists of moderately well drained, nearly level to sloping soils developed in compact glacial till. These soils are underlain by a compact layer, or hardpan at a depth of about 24 inches. Their permeability is moderate in the surface layer and subsoil but is slow in the substratum. Most use problems are related to seasonal wetness and slow percolation. Generally, these soils require engineering modifications for foundation placement, septic fields, and road construction.

General Soils Statement

As shown in Figures 6 and 7, over 90% of the site is rated as having severe limitations for residential development according to U.S.D.A. Soil Conservation Service criteria. Many of the proposed lots are underlain by inland wetland soils, shallow to bedrock soils, hardpan soils, and areas of seasonally high water table. In addition, many of the lots are proposed in areas of steep slopes. These limiting factors may not preclude development of the property, but they do indicate that great care must be taken in developing the land to avoid significant environmental harm.

During the ERT field review of August 1979, several soil inclusions were noted on this parcel which were not mapped as part of the original soil survey. For example, some of the soils mapped as HrE (steep slope Hollis soils) were actually found to have level inclusions of what appear to be Charlton soils. If these Charlton inclusions could be shown to be extensive enough to support an adequate septic system, the severe HrE site rating could be changed significantly. On the other hand, also encountered in the field review were pockets of wetland soils which were not shown in the orignial soil survey. The presence of such wetlands can drastically affect the suitability of a lot for residential development.

In light of the presence of the soil inclusions, and their significance with respect to development potential of the property, it is strongly recommended that the developer contact a private soil scientist to do a detailed soils mapping of the parcel. A detailed mapping would more clearly define those areas which should be avoided during development; and would highlight those areas where development is much more feasible.

The character of this site is such that a low density development, that is carefully planned and laid out (to take optimum advantage of favorable soils, avoiding unfavorable ones) could be nicely worked into the surrounding landscape with little negative environmental impact. The present layout, however, if implemented, would likely have a major affect on the local eco-system.

Erosion and Sediment Concerns

Much of the property is characterized by soils with a high erodibility-potential. If not controlled, soil erosion can scar the landscape, pollute surface water, and clog streams with sediment. With any development of this property, it is recommended that a detailed erosion and sediment control plan be prepared to cover each stage of the proposed development schedule.

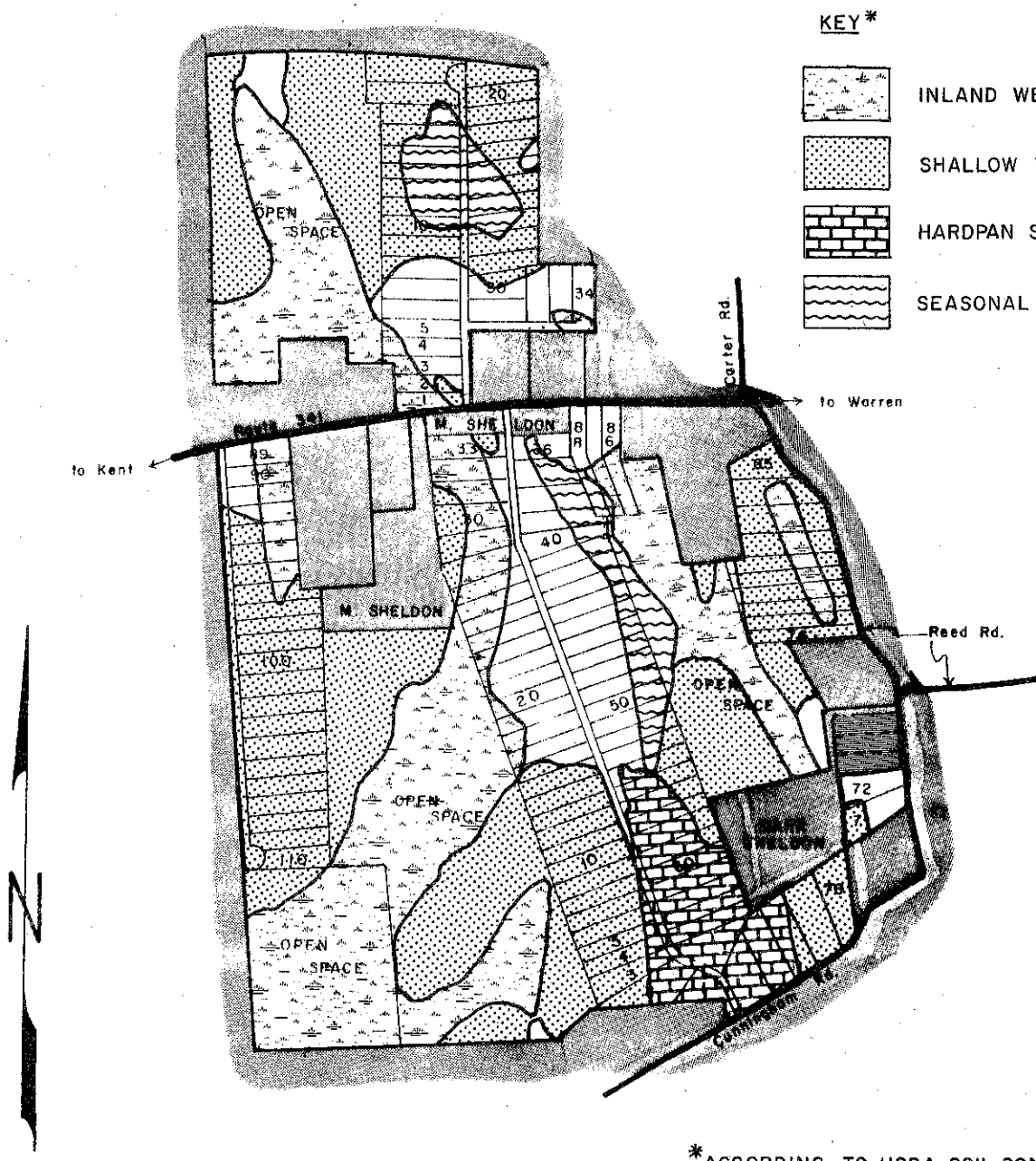
Techniques for effective erosion and sediment control are presented in the "Erosion and Sediment Control Handbook - Connecticut" (U.S.D.A. Soil Conservation Service, 1976) available from the Litchfield County Soil and Water Conservation District office in Litchfield, Connecticut. This plan should include basic items such as:

FIGURE 6.

DEVELOPMENT LIMITATIONS MAP I

FIGURE 7.

DEVELOPMENT LIMITATIONS MAP II



SCALE: 1" = 1000'

0 1/4 1/2 mile

0 1000' 2000' 3000'

*ACCORDING TO USDA SOIL CONSERVATION SERVICE CRITERIA, THESE FACTORS PRESENT SEVERE LIMITATIONS FOR RESIDENTIAL DEVELOPMENT.

• NOTE: MUCH OF THE SITE IS ALSO CHARACTERIZED BY STEEP SLOPE AREAS WHICH REPRESENT A SEVERE LIMITING FACTOR (SEE SOILS MAP AND SOILS LIMITATION CHART IN APPENDIX)

- Limit soil disturbance during construction.
- Regrade and revegetate exposed areas as the development progresses.
- Attempt to keep cuts and fills at a 2:1 slope (or flatter).
- Use erosion and sediment controls such as haybale check dams wherever feasible.
- Plan a time schedule for development (i.e. do not do wetland related work in the spring. Wait for low flows and a lower water table.)
- Provide for sediment traps in the storm water management system and provide for their continual maintenance. (If not maintained, sediment cannot be adequately controlled.)
- It is advisable to complete each section of the proposed roads (with culverts and sumps) before the lots along that section are developed. This includes road bank stabilization and/or revegetation.
- No soils should be left exposed during the winter months. An annual grass should be seeded on these areas.

VIII. VEGETATION

The Sheldon property may be divided into eight stands of four different vegetation types. The location of these stands and types is shown in Figure 8. A brief description of each of these vegetation types is presented below.

Mixed Hardwoods (Stands 1,4,7). The trees in these stands range from 6" to 16" in diameter at breast height (dbh). The predominant overstory species are red maple, red oak, white oak, black cherry and black birch. The primary understory shrub species are striped maple, witch hazel, blue beech (Carpinus), hawthorn, blueberry and Rubus spp. Changes in topography and soil types within the mixed hardwood stands often revealed a change in the overstory species. For example, the lower areas with moister soils often showed a preponderance of red maple in the overstory. Areas such as the north central portion of stand #1, with greater elevation and Hollis soils, show a greater proportion of oaks and hickories. Sometimes the change in species composition resulted from only a few feet change in elevation.

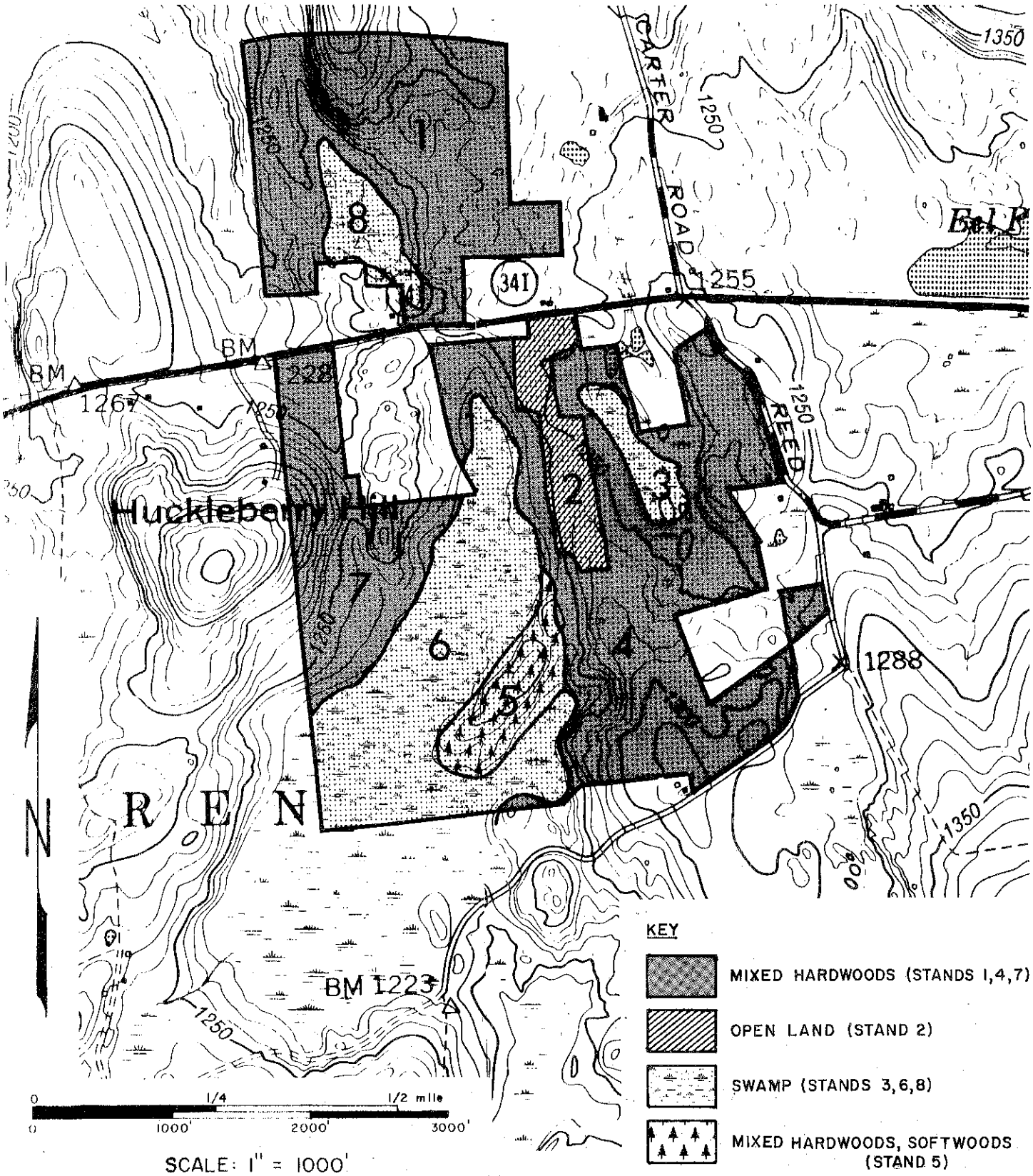
Open Land (Stand 2). This is an open area that is reverting to forest land. Although much is still covered by grass, certain tree species are invading - e.g. cherries (Prunus spp.), red maple, quaking aspen, birches (Betulus spp.). A very common shrub component is the viburnums (Viburnum spp.).

Swamp (Stands 3,6, and 8). All of these stands are characterized by a high water table. Stand 3 is primarily open although clumps of red maple are scattered throughout. Stand 6 is quite extensive with the primary tree species being red maple, white pine and hemlock. Some spruce was also observed in stand 6 which is quite significant and discussed further below. Stand 8 is also a wetland area with tree species consisting largely of red maple and associated hardwoods.

Mixed Hardwoods/Softwoods (Stand 5). Hemlock is a major component in the western half of this stand. A timber sale in this stand (about 5 to 10 years ago) removed much of the hemlock in the eastern half. Associated hardwoods in this stand are ash, sugar maple and red maple, black birch, and red and white oak. Near the swamp, beech is found along with the hemlock.

FIGURE 8.

GENERAL VEGETATION MAP



Rare and Endangered Species

Along the western edge of stand 5, in close proximity to the swamp, small spruce seedlings were observed. Further investigation revealed one spruce about 10" dbh along the swamp edge. By going into the swamp some distance, a greater number of spruce seedlings were found in addition to more full grown (i.e. about 10" dbh) trees. It appears that the trees are black spruce (Picea mariana) rather than red spruce (P. rubens) which are similar in appearence. This identification was based on a twig sample and needle lengths.

Both black and red spruce are listed as "rare" in the publication, Rare and Endangered Species of Connecticut and Their Habitats (Dowhan and Craig; 1976; State Geological and Natural History Survey of Connecticut and the Natural Resources Center, Department of Environmental Protection; Report of Investigations No. 6).

Quoting from this publication: for black spruce - "Rare. Near the southern limit of its range. Grows in open to heavily wooded acid, sphagnous bogs and swamps. Occurs chiefly in Northwest Uplands and Highland regions, only locally elsewhere, and absent near the coast. Habitat destruction poses a major threat to this species throughout southern New England." (page 50)

For red spruce: "Rare. A northern tree species of only local occurrence in the mountains south of northern New England. It grows in cool, rocky upland woods and bogs in the Northwest Highlands region." (page 51)

The present development proposal would leave the subject area in its natural condition as "open space". This is desirable as it will serve to protect these "rare" spruce trees from direct physical injury. It is also important, however, to carefully control development uphill from the area to ensure that erosion, sedimentation, and runoff do not become a problem and represent a threat to the area.

Vegetation Management

It appears that the greatest limiting condition to potential design and maintenance of vegetative cover is soil moisture. This does not apply to the entire property but is pertinent to those sites located on soils where wetness is a problem.

Soil wetness limits the species that can be established in landscape design work. In addition, trees growing on wet soils are very susceptible to windthrow. Soil particles in a saturated soil will not provide as firm an anchoring system as soil particles in a drier soil. Also, in wet soils, the trees root system will probably be located closer to the surface. This is primarily due to the lack of air in the lower soil layers and subsequently provides for less anchoring ability in strong winds.

Care should be taken to avoid changes in the water table on wet soils with development of this property. Even a small rise in the water table may result in a lack of oxygen for tree roots and the subsequent death of trees.

For those areas labelled as "open space" on the simplified site plan, and other areas where wet soils occur, any cultural treatments such as thinning might only increase the likelihood of windthrow. In these areas, neighboring trees act as buffers in high winds and removal of a portion might result in more trees being blown over.

For the woodland that is encompassed by the proposed development, care should be taken during construction to minimize the number of mechanical injuries to trees. Also it must be kept in mind that any grade changes around trees meant to be retained may be extremely detrimental to the health of the tree. Only several inches of clay soil placed above the original grade around the base of a tree may kill the tree.

One practice which could enhance the dry land forest types over a long period of time would be fuelwood thinnings to remove suppressed trees and other trees of very poor quality. Among trees that could be cut are those with: 1) decay already present, 2) forks or 3) multiple stems that causes them to be a potential hazard during storms. With residential development of this property, the above practice would probably best be carried out by the individual landowners so that they could utilize the wood while managing their lots to their own aesthetic desires.

IX. WILDLIFE

The Sheldon property offers good habitat for upland wildlife and wetland wildlife. The diversity and interspersion of vegetation types (open fields, brushland, woodland, wetland) together with the low human population in the area enhances the wildlife value of the site.

Many species of wildlife can be expected to reside in this area. These include white tailed deer, grey squirrel, ruffed grouse, wood frog, box turtle, cottontail rabbits, and numerous song birds.

The proposed development, although designating a substantial acreage to open space, would have a significant negative impact on wildlife. The principle threat to wildlife as a result of the proposed development is direct loss of habitat due to roads, homesites and driveways. Even those areas not physically changed will be impacted due to the increased human presence, vehicular traffic, and number of roaming cats and dogs.

Although, in general, the quality of wildlife habitat will decrease with implementation of the project, some wildlife species may become more plentiful. These would include species typically associated with homesites such as raccoons, skunks, house sparrows and starlings.

Potential problems may arise with wildlife in the future. Beavers may move into any of the wetlands at any time with some construction activity of their own. Elevated water levels caused by beavers could flood septic fields or basements should these be located too close to the wetland areas. Deer and raccoon can, of course, always be a problem in gardens; and deer can ruin shrubbery. With development of this property, it is recommended that landscape shrubbery be chosen which is resistant to damage by deer.

X. SEPTIC SYSTEMS

Results of Field Review

Six general areas were observed in the field the day of the ERT field review. Observations and comments on these areas with regards to subsurface sewage disposal are presented below. It should be noted that these comments are based upon field investigation of the surface features of the site. No results of deep observation pits or percolation tests were available for review by the team.

- Area 1 (Lots 1 through 5 and 60 through 70).* This area, located off Cunningham Road, is mostly flat. Large portions appeared wet even at the time of year observed. An unmapped wetland area was pointed out by the soil conservationist for the team.

  Conditions for on-site sewage disposal in this area are severe. Drainage does not appear feasible due to the lack of slope and an extremely high water table was evident throughout much of this area.

- Area 2 (Lots 71 and 72). This area is mapped as a Sutton soil which exhibits a seasonally high water table. Again slopes do not appear sufficient for effective control of any seasonally high water table by curtain drains.

- Area 3 (Lots 76 through 85). Large areas of surface water and what may have been ledge rock outcroppings were observed. On site sewage disposal does not appear feasible in this area.

- Area 4 (Lots 10 through 59). This area located to the south of Route 341, has a large portion mapped as Charlton soil series which is generally acceptable for on-site sewage disposal. However soil testing as outlined below should be conducted and would be the only appropriate judge of conditions in this area with regard to suitability for on site sewage disposal. Any layout of lots and roads should be done in consideration of soil test results.

- Area 5 (Lots 1 through 34 to the north of Route 341). Rock outcroppings and wet areas were observed throughout much of this area. Although the density of housing proposed does not appear feasible, soil testing may locate limited, adequate areas for sewage disposal and a modified proposal may be developed from test results.

- Area 6 (Lots 89 through 110). The area is mapped generally as a Hollis soil series which is shallow to bedrock. A wet area is located to the rear portion of the proposed lots. Again any proposal for development of this area should contain adequate soil testing data. Of particular concern is depth to ledge rock and provision of adequate area on each proposed lot for all required sanitary facilities (well, septic system and reserve areas).

General Comments

As shown in Figure 6, and the Soils Limitation Chart in the Appendix of this report, most of the subject area has severe limitations for subsurface sewage disposal. Major limiting factors include shallowness to bedrock, steep slopes and wetness. The ERT field investigation confirmed the presence of these limiting factors throughout major portions of the site.

In order to conclusively determine the suitability of this land for subsurface sewage disposal, it will be necessary to conduct deep observation pits and percolation tests on each lot. A minimum of one deep observation pit in the primary sewage disposal area and one deep observation pit in the reserve area is essential. Deep observation pits should be made to a depth of at least 7 feet below ground surface (unless ledge rock is encountered at shallower depths). The purpose of these tests is to observe groundwater, ledge rock, and soil conditions. A percolation test should also be provided in the primary sewage disposal area of each lot. Such detailed testing is essential to determine if adequate primary and reserve sewage disposal areas are available on each lot.

*Refer to Figure 1.

Additional deep observation pits and/or percolation tests should be conducted as warranted by site conditions. A primary example of this would be where shallow to bedrock conditions exist in an area and more extensive deep observation pit testing is required to delineate adequate areas for sewage disposal systems.

Where questions as to levels of high seasonal groundwater tables exist, additional testing may be necessary in the wet time of the year to confirm the suitability of the area for subsurface sewage disposal.

To conclude, detailed on site soils testing is essential to determine the suitability of the land for the proposed subsurface sewage disposal systems. Preliminary analysis indicates that major portions of the site are not suitable for sanitary waste disposal by septic systems.

XI. PLANNING CONSIDERATIONS

Consistency of Proposed Project with Existing Plans

A review of the "State of Connecticut - Conservation and Development Policies Plan 1979 - 1982 Locational Guide Map - December 1978" indicates that the proposed subdivision lies within two land use designations - "Rural and Preservation". The "State Action Strategy" for Rural Areas is "Avoiding support of structural development forms and intensities which exceed on-site carrying capacity for water supply and sewage disposal on a permanent basis, which are inconsistent with open rural character or conservation values of adjacent areas and which are more appropriately located in Rural Community Centers". The southwestern portion of the property south of Route 341 appears designated "Preservation" due to its classification as "Swamps, marshes, bogs - those wetland soils classes with permanent or seasonably high water table as defined by U. S. Soil Conservation Service." The "State Action Strategy" for Preservation Areas is "Foster the identification of significant resource, heritage, recreation, and hazard areas of statewide significance and advocate their protection by public and quasi-public agencies in their planning and investment decisions; avoid support of structural development except as directly consistent with the preservation values".

The subdivision as proposed appears to be in conformance with the Preservation Action Strategy in that large areas of the extensive wetlands area in the southwestern portion of the southern parcel are preserved as Open Space. However the development of the property into one-acre lots may not be in conformance with the Policies Plan. Due to the soils limitations present on the property, the one acre lots may be unable to support on-site water and sewage disposal on a permanent basis.

The "Plan of Development" for Warren dated October 1974 makes the following recommendations on land use densities in the town: "Since Warren is presently dependent for on lot water and sewage disposal, and since the findings in the soils analysis indicates that two-thirds of the land in Warren is less than suitable for development, it is recommended that Warren keep the minimum lot size to two acres for residential purposes". The plan as proposed may not be in conformance with the intent of the Warren Plan of Development which is to recommend development at a density which can be supported by natural soils.

Traffic and Circulation

The project as proposed indicates access will be off Route 341. Sixteen lots will front on existing town streets, Reed Road and Cunningham Road. The remaining 123 lots will have access via four proposed subdivision roads entering at 3 points onto Route 341.

The 1977 estimated traffic count on Route 341 in the vicinity of Reed Road is 800 vehicles; up from the 600 average daily traffic (ADT) counted in 1975. This is well below the maximum rated capacity of 2,000 vehicles per hour. Hence, current traffic volumes are only approximately 4% of capacity.

It is difficult to calculate the immediate impact of this project on Route 341 since there is no timetable for development. However, the ultimate traffic impact may be estimated. Two independent studies one by the Institute of Transportation Engineers, the second by Traffic Statistics Unit, Connecticut Department of Transportation indicate a traffic generation rate median range of between 10 and 10.6 one way traffic movements per dwelling unit per week day for single family detached housing. Using these figures it is estimated that the 139 lot development will generate between 1,390 and 1,473 trips per day. The additional traffic will enter Route 341 via either the proposed subdivision roads or Reed Road. While the proposal will result in a significant increase in traffic given the current use of Route 341, the road should be able to absorb the additional load.

The developer should review the proposed subdivison road locations with the State Traffic Commission to determine if a permit will be necessary since access is proposed on a state highway.

While it would be desirable for the two principal subdivision roads to have access to Route 341 opposite each other, to reduce possible traffic conflicts, this will not be practical due to the topography situation on the south side of Route 341. It is recommended that lots fronting on both a subdivision road and Route 341 not be allowed driveway access onto Route 341. This road is one of the two major roads in town and driveway access would result in decreased traffic capacity of the road and an increase in safety hazards.

Where necessary, sight distances at all proposed road and driveway locations should be improved by tree pruning or removal. This is particularly important where proposed subdivision roads enter Route 341. The principal subdivision road which runs through to Cunningham Road has a restricted sight distance of 50-60 feet looking westerly. It is recommended that the subdivision road be moved easterly to increase sight distance looking west. However, care should be taken not to relocate the road directly opposite the home on the north side of Route 341.

Sight distance along Reed Road and Cunningham Road is restricted in places such as lots 83 and 85. Therefore, care should be taken in placing driveways on lots in such areas. It is recommended that, if possible, driveways on adjoining lots be combined to reduce the number of driveway entrances and likewise reduce potential traffic hazard locations.

Compatability of Surrounding Land Use

Proposed residential use of this parcel, if carefully planned and implemented, would not be in conflict with surrounding land uses. The properties surrounding the proposed subdivision are either developed residentially or are vacant and forested.

Support Facilities

The project as proposed calls for 139 single family units. To determine the impact of the proposed development on Warren and its school system, the average family size and number of school-aged children were calculated as follows:

In 1975, there were 406 housing units in the Town of Warren*, the total population was estimated at 967**, while the school age population (those persons between 5 and 19 years of age) was 232+. Given the above, it was calculated that there were 2.38 persons/housing units and .57 school age children/housing unit in 1975. It is cautioned that these figures may be conservative since they include year round and vacation homes. Using the 2.38 and .57 figures and applying them to the development size of 139 units, approximately 330 additional residents including 79 school age children could be expected because of the development. Given the probable length of development of the project, it should be noted that the above figures are very tentative and could change significantly if housing market or demographic factors change.

The Warren Elementary School serving grades K - 6 had a June 1, 1979 enrollment of 99 students. Its capacity is approximately 225 students. Wamogo Regional High School had a June 1, 1979 enrollment of 523 students with an approximate capacity of 650 students.

Given the enrollment and capacity figures for the public schools and the projected additional school age population generated by the proposed development, it appears that the schools will be able to absorb the additional students. However, this observation is based independently of any additional enrollment resulting from other development in Warren or in the case of Wamogo, from development in Morris or Goshen.

Other Comments

To lessen the visual impact of development of this land on the Warren landscape, it is recommended that thought be given to providing a buffer area along Route 341, one of the principal routes in Warren. This buffer area would retain the natural vegetation and screen the proposed lots visually from Route 341 thereby retaining the rural feeling along the highway. The buffer area would not preclude access by the proposed subdivision roads onto the highway.

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* Construction Activity Authorized by Building Permits - Housing Units in Connecticut, Annual Summary 1975. Prepared by M. L. Johnson & T. E. Skarupa, Bureau of Housing.

** State of Connecticut Revised Preliminary Population Projections for Connecticut Municipalities by Age and Sex to the Year 2000. Prepared by Division of Health Statistics, State Dept. of Health with assistance from Comprehensive Planning Div., Office of Policy & Management.

\+ Ibid.

To add flexibility in the design of lots on the subdivision, it is recommended that consideration be given to permitting several lots, the exact number would depend on the outcome of soils testing, on the prong of high land jutting southwesterly from the cleared areas in the vicinity of lots 10-15 into the large swamp to the southwest. The prong, approximately 12 acres in size and not as steep as mapped, could allow some alternate house locations for lots where significant developmental problems exist.

XIII. CONSISTENCY OF PROJECT WITH LAKE WARAMAUG WATERSHED MANAGEMENT PLAN

The Lake Waramaug Task Force was formed in 1975 out of citizen concern to develop a program to improve the lake's water quality. Task Force members requested a survey by the King's Mark Environmental Review Team which resulted in a recommendation for a comprehensive water quality study of the lake.

This study was undertaken by the Task Force and performed by the U.S. Geological Survey with data analyzed by a private consultant. The study assessed the causes of Lake Waramaug's recently observed and documented water quality problems and set forth realistic measures to improve lake water quality. This was achieved by investigating existing and potential future sources of pollution in the watershed and developing a realistic long-term Watershed Management Plan aimed at reducing undesirable nutrient and sediment inflow to the lake, thus slowing the rate of accelerated eutrophication. The Management Plan, dated 1978, has been accepted by the three towns in the watershed and the State Department of Environmental Protection.

The purpose of the Task Force now is to see that the Management Plan is implemented and that all steps possible are taken to assure that existing sources of nutrients entering the lake are abated and any future additional sources are avoided. To this end the Task Force has received federal, local and state funding to preserve this resource which is valuable to the entire State. Lake Waramaug is Connecticut's second largest natural lake and, in addition to its benefits to the immediate lakeside residents, provides a substantial recreation facility for over 150,000 annual visitors to the Lake Waramaug State Park. In 1975 dollars, the lake represents an 8.8 million dollar resource to the region that all involved are eager to protect.

Of the lots proposed for development at the Sheldon site, almost the entire section south of Route 341 is included in the Lake Waramaug Watershed. Only a small segment of the property north of Route 341 is in the watershed (refer to Figure 4). Of the area south of Route 341, the western half drains into an unidentified brook which feeds Straits Pond; the eastern half drains into the Sucker Brook watershed. This general area south of Route 341 currently contributes low levels of phosphorous and sediment to the lake according to recent water quality tests.

The major thrust of the Lake Waramaug Watershed Management Plan is to keep nutrients out of the lake, as it is much easier to prevent nutrients from entering the lake than it is to remove them once they are in the lake. Lake Waramaug is a phosphorus limited lake. This means that the one nutrient which governs the growth of algae and plants in the lake is phosphorus. If phosphorus levels are

allowed to rise, the subsequent increase in algal blooms and vegetation will rapidly lead to further degradation of the lake's water quality. It should be emphasized at this point that once phosphorus enters the lake it can be recycled again and again in algal and plant growth and therefore, rather than having a one time impact, it leads to a cumulative effect of greater and greater degredation over time.

The primary source of phosphorus according to the study conducted by the U.S.G.S. is from surface erosion. This erosion is accelerated whenever the soil is disturbed (e.g. during construction), and tends to continue over time at a higher rate for developed areas than for forested ones. In addition to releasing large quantities of phosphorus into streams and eventually the lake, this erosion also causes serious siltation and contributes significantly to the physical filling of the lake itself.

In order to avoid these adverse effects, the Lake Waramaug Watershed Management Plan, in keeping with the recommendations of the Soil Conservation Service recommends a minimum 150' setback from all streams, wetlands, and water bodies for all homesites constructed in the watershed. Depending upon soil type, depth to bedrock or hardpan, and slope, effective distances may be even greater. Furthermore, the Management Plan recommends strong erosion, sediment and runoff controls throughout the entire watershed with particular emphasis placed on construction sites and areas which have been identified as critical natural features within the watershed. This includes inland wetlands, watercourses, flood hazard areas, slopes greater than 15%, areas where the depth to bedrock or hardpan is 20 inches or less, and areas which in general have a high potential for erosion. As can be seen from Figure 7 in this report, the majority of the site proposed for development is characterized by such critical natural features. Although these considerations do not necessarily rule out the possibility of residential development on this property, they do indicate that land development should be based upon very careful site planning and environmental control. Strict controls during and after construction so as to prevent any eroded material or other sources of phosphorus from reaching wetlands or watercourses which feed the lake are of utmost importance.

To be consistent with the Management Plan, no homesite construction should occur in or within 150 feet of any wetlands or watercourse. In addition, all necessary steps should be taken to prevent on-site erosion during and after construction.

The proposed septic systems are another area of concern. For the health of the lake, septic systems should be designed to not only meet the state health codes regarding coliform, but also to assure complete phosphorus attenuation of septic system effluent.

Phosphorus is not eliminated in the usual passage of effluent through septic tank and leach field but is taken up through bonding action with soils. Different soils have different capacities for phosphorus uptake. Therefore, calculations should be made on all lots insuring that there is adequate soil volume and attenuation capacity between the leach field and any watercourse or wetland to ensure that all phosphorus is removed before any septic system effluent reaches a watercourse or wetland. To ensure this means that all septic systems and their leach field must comply with a minimum set back of 100 feet from all watercourses and wetlands and depending on soil type and percolation rates in some cases this distance may need to be considerably greater. Accurate soils analysis and phosphorus attenuation calculations should be made for each individual system. Needless to say depth to bedrock or hardpan is a critical component of this calculation.

Both the Sucker Brook subwatershed and the Straits Pond Brook subwatershed as outlined in Figure 4 are essentially pristine according to the U.S.G.S. water quality testing. The Straits Pond Brook subwatershed, which drains the western section of the proposed development south of route 341 is an area of particular concern.

Straits Pond Brook provides 78% of the inflow waters to the entire northwestern arm of Lake Waramaug. This northwestern arm of the lake is by far the most vulnerable area of the lake. Even a small change in the water quality of Straits Pond Brook would have a significant impact on the water quality of the northwest arm for the following reasons:

1. The northwest arm is the shallowest and narrowest section of the lake and as a result has the smallest volume of water.

2. The only significant source of inflowing waters is from Straits Pond Brook, and these waters provide both the dilution and replacement waters for the northwest arm.

3. Because these inflows are only a small percentage of the total volume of water in the northwest arm, the water here has a long residency time.

4. The State Park located on this arm of the lake makes substantial demands for high water quality so that the amenity of the recreational use (swimming, boating,picnicking, and camping for 150,000 annual visitors) will be preserved.

5. Development of Arrow Point will be adding up to forty-two housing units in the next few years to this piece of land boarding the eastern shore of the northwest arm. Although these sites are required to meet the strictest building standards for both construction and septic systems, the increased use of this piece of land will undoubtedly have an impact on the water quality of the northwest arm.

All of the above factors, small water volume, low flushing rate, long residency time, and intense public usage, combine to make this the most vulnerable section of the lake. Therefore any pollutants that enter this area of the lake willtend to recycle for long periods of time and continue to have an adverse effect. Furthermore, when these pollutants are flushed from the northwest arm, they must travel the entire length of the lake during which time they will continue to cause further water quality degradation.

In order to ensure the protection of Lake Waramaug and be consistent with the goals of the Lake Waramaug Watershed Management Plan, the following is recommended:

- That strict controls be required of the developer both during and after construction as discussed above to insure that both erosion and phosphorus do not have an adverse impact on the water quality of both Straits Pond Brook and Sucker Brook. Potential purchasers of property on this site should be advised of the limitations placed upon each lot.

- That a series of water quality tests be conducted at design points 1 and 2 (see Figure 4) before construction begins. These tests should be continued during construction so that if any significant increases in pollutants is observed, construction can be immediately halted until such a condition is corrected. It is suggested that the water be tested for the following: total coliform, suspended sediment, dissolved solids, specific conductance, total phosphorus, total nitrogen, and total discharge rates in cubic feet per second. The cost of such a testing program should be borne by the developer.

This policy of instituting a testing program both before and during construction is a program that has been implemented in the case of the Lake Waramaug State Park. Perhaps the best way to implement this at the Sheldon site would be to require a bond issue from the developer. Such a bond issue would ensure that, in the event a pollution problem does arise during construction, proper corrective actions can be taken.

The efforts of the Lake Waramaug Task Force are directed toward protecting both the town and the developer. It is clear from the above discussion that there are a diverse number of pressures on the water quality of the northwest arm. Through the program outlined above, sources of pollution can be accurately identifield so that corrective action can be taken if necessary.

The Lake Waramaug Task Force will be happy to work with the town in designing such a water quality testing program.

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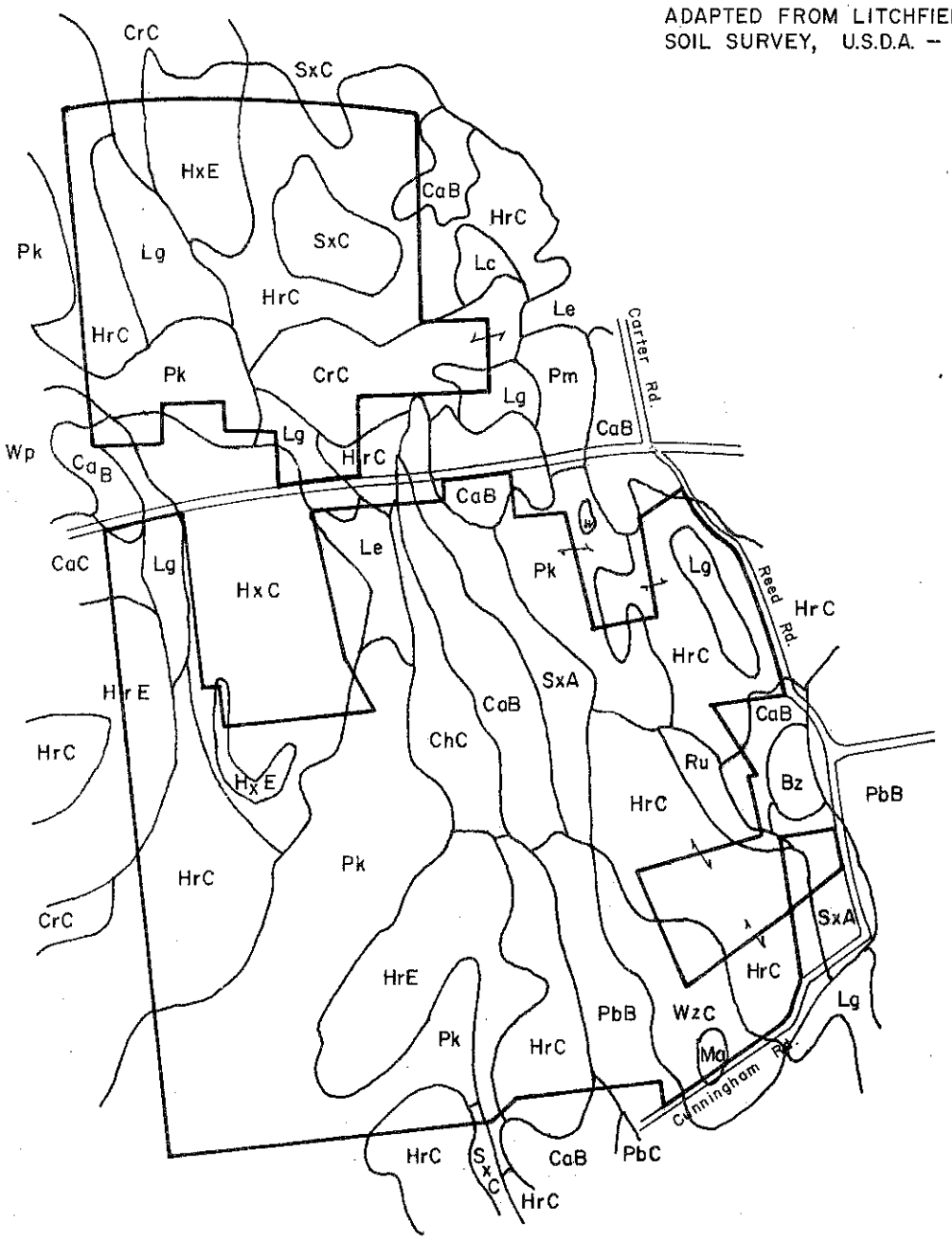
APPENDIX

SOILS MAP

ADAPTED FROM LITCHFIELD COUNTY
SOIL SURVEY, U.S.D.A. – S.C.S.



SCALE: 1" = 1000'

0 1/4 1/2 mile

0 1000' 2000' 3000'

SOILS LIMITATION CHART
SHELDON CLUSTER SUBDIVISION

MAP SYMBOL	SOIL NAME	SEPTIC ABSORBTION FIELDS		BUILDINGS W/ BASEMENTS		ROADS OR DRIVEWAYS		LANDSCAPING	
		RATING	REASON	RATING	REASON	RATING	REASON	RATING	REASON
Bz	Birdsall silt loam	Severe	Wetness, Percs slowly	Severe	Wetness	Severe	Wetness, Frost action	Severe	Wetness
CaB	Charlton fine sandy loam, 3-8% slopes	Slight	--	Slight	--	Slight	--	Slight	--
CaC	Charlton fine sandy loam, 8-15% slopes	Moderate	Slope	Moderate	Slope	Moderate	Slope	Moderate	Slope
Chc	Charlton stony fine sandy loam, 8-15% slopes	Moderate	Large stones	Moderate	Large stones, Slope	Moderate	Slope	Moderate	Large stones
CrC	Charlton very stony fine sandy loam, 3-15% slopes	Severe	Slope	Severe	Large stones	Moderate	Large stones	Severe	Large stones
HrC	Hollis very rocky fine sandy loam, 3-15% slopes	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock
HrE	Hollis very rocky fine sandy loam, 15-35% slopes	Severe	Slope, Depth to rock	Severe	Slope, Depth to rock	Severe	Slope, Depth to rock	Severe	Slope, Depth to rock
HxC	Hollis extremely rocky fine sandy loam, 3-15% slopes	Severe	Depth to rock, Large stones	Severe	Depth to rock, Large stones	Severe	Depth to rock	Severe	Depth to rock, Large stones
HxE	Hollis extremely rocky fine sandy loam, 15-35% slopes	Severe	Slope, Depth to rock, Large stones	Severe	Slope, Depth to rock, Large stones	Severe	Slope, Depth to rock	Severe	Slope, Depth to rock, Large stones
Lc	Leicester fine sandy loam	Severe	Wetness	Severe	Wetness	Severe	Wetness, Frost action	Severe	Wetness

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MAP SYMBOL	SOIL NAME	SEPTIC ABSORBTION FIELDS		BUILDINGS W/ BASEMENTS		ROADS OR DRIVEWAYS		LANDSCAPING	
		RATING	REASON	RATING	REASON	RATING	REASON	RATING	REASON
Le	Leicester stony fine sandy loam	Severe	Wetness	Severe	Wetness	Severe	Wetness, Frost action	Severe	Wetness
Lg	Leicester, Ridgebury & Whitman, very stony fine sandy loam	Severe	Wetness	Severe	Wetness	Severe	Wetness, Frost action	Severe	Wetness
Ma	Made Land	S O I L C H A R A C T E R I S T I C S V A R I A B L E							
PbB	Paxton fine sandy loam, 3-8% slopes	Severe	Percs slowly	Moderate	Wetness	Moderate	Frost action	Moderate	Small stones
PbC	Paxton fine sandy loam, 8-15% slopes	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope
Pk	Peat & Muck	Severe	Wetness	Severe	Wetness	Severe	Wetness	Severe	Wetness
Pm	Muck, shallow	Severe	Wetness	Severe	Wetness	Severe	Wetness	Severe	Wetness
Ru	Rumney fine sandy loam	Severe	Floods, Wetness	Severe	Floods, Wetness	Severe	Floods, Wetness, Frost action	Severe	Floods, Wetness
SxA	Sutton very stony fine sandy loam, 0-3% slopes	Severe	Wetness	Severe	Wetness	Moderate	Frost action	Moderate	Large stones
SxC	Sutton very stony fine sandy loam, 3-15% slopes	Severe	Wetness	Severe	Wetness	Moderate	Slope, Frost action	Moderate	Slope, Large stones

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MAP SYMBOL	SOIL NAME	SEPTIC ABSORBTION FIELDS		BUILDINGS W/ BASEMENTS		ROADS OR DRIVEWAYS		LANDSCAPING	
		RATING	REASON	RATING	REASON	RATING	REASON	RATING	REASON
Wp	Whitman stony fine sandy loam	Severe	Percs slowly, Wetness	Severe	Wetness	Severe	Wetness, Frost action	Severe	Wetness
WzC	Woodbridge very stony fine sandy loam, 3-15% slopes	Severe	Percs slowly	Severe	Wetness	Severe	Frost action	Moderate	Large stones

EXPLANATION OF RATING SYSTEM

1. SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.
2. MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.
3. SEVERE LIMITATION: indicates that the use of the soil is seriously limited by hazards or restrictions that require extensive and costly measures to overcome.

NOTE: Limitation Ratings Based Upon U.S.D.A. Soil Conservation Service Criteria.

ABOUT THE TEAM

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state, and regional agencies. Specialists on the team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, recreation specialists, engineers, and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - a 47 town area in western Connecticut.

As a public service activity, the team is available to serve towns and developers within the King's Mark Area --- free of charge.

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 the review of a wide range of significant activities including subdivisions, sanitary landfills, commercial and industrical developments, and recreation/open space projects.

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 official of a municipality or the chairman of an administration agency such as planning and zoning, conservation, or inland wetlands. Requests for reviews should be directed to the Chairman of your local Soil and Water Conservation District. This request letter must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer allowing the team to enter the property for purposes of review, and a statement identifying the specific areas of concern the team should address. When this request is approved by the local Soil and Water Conservation District and the King's Mark RC&D Executive Committee, the team will undertake the review. At present, the ERT can undertake two reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil Conservation District Office or Richard Lynn (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P.O. Box 30, Warren, Connecticut 06754.