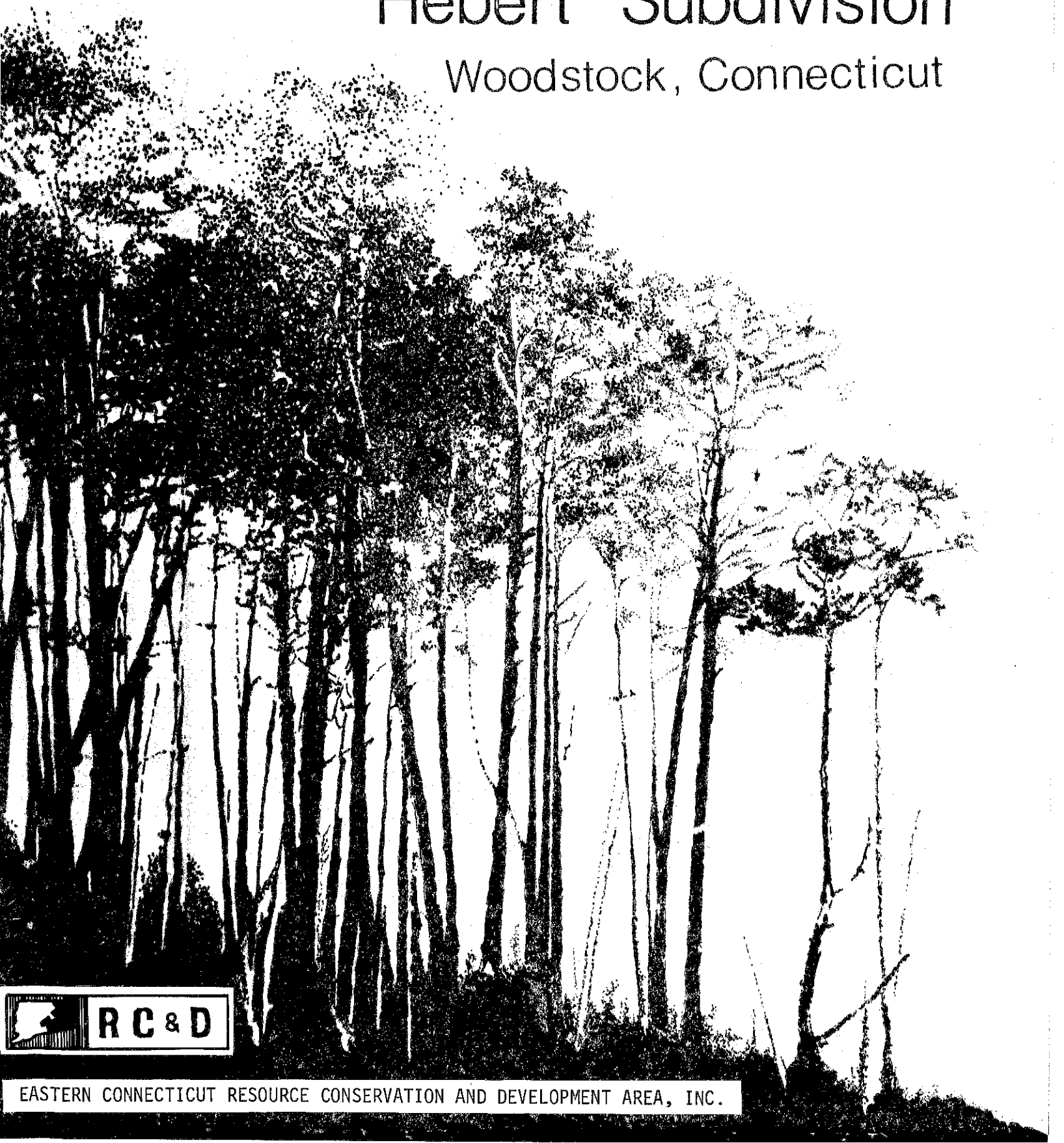
Environmental Review Team Report

Hebert Subdivision

Woodstock, Connecticut



R C&D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

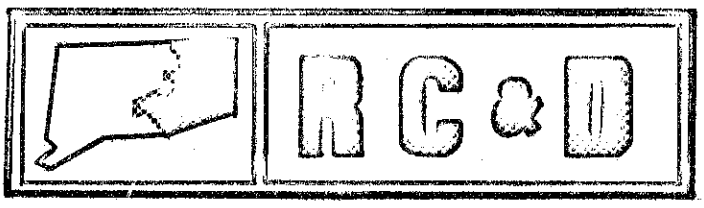
Environmental Review Team Report

on

Hebert Subdivision

Woodstock, Connecticut

July 1979

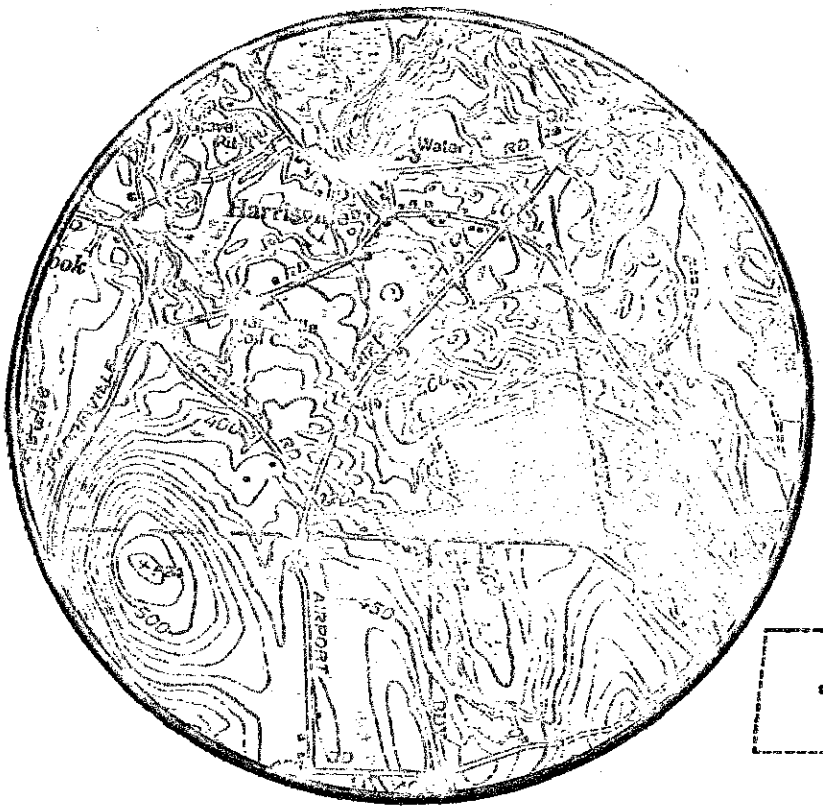


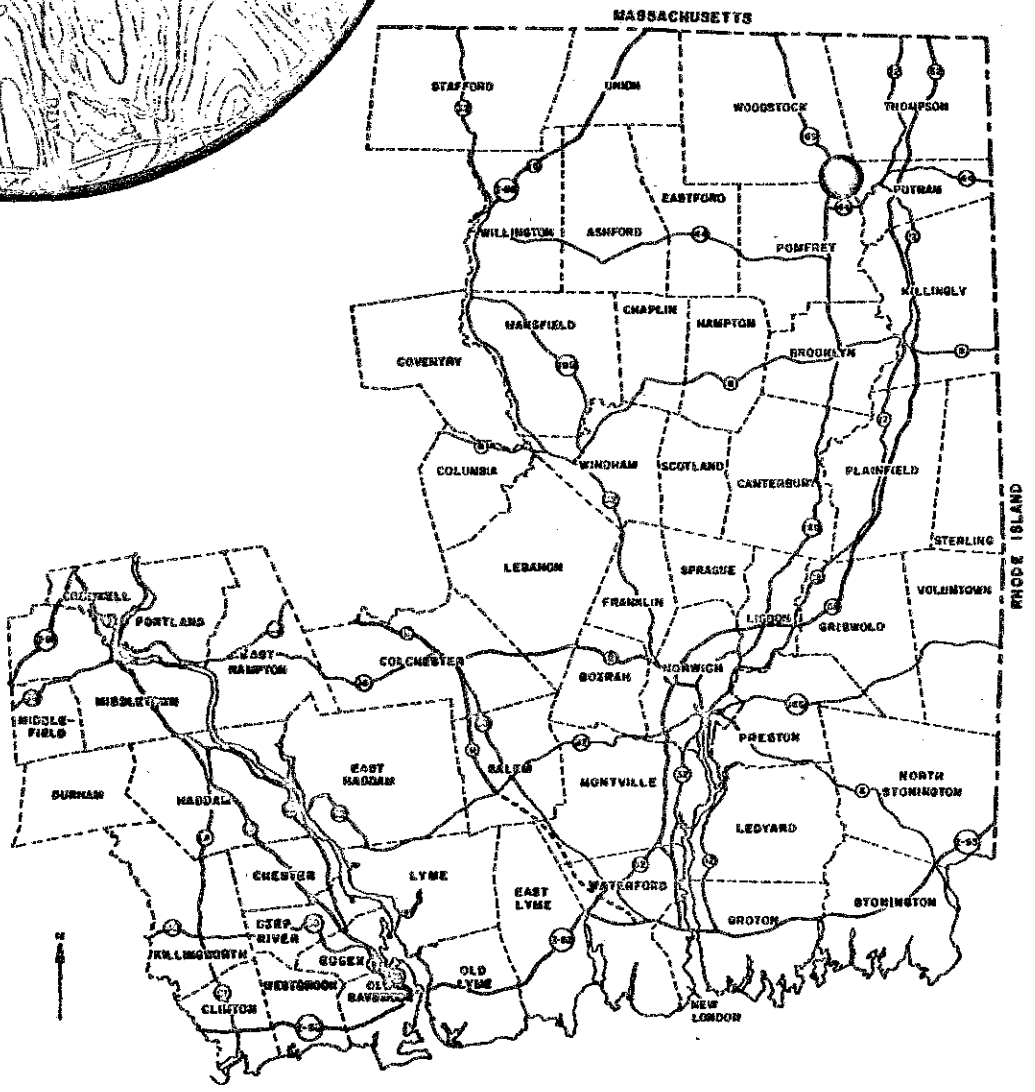
eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

HEBERT PROPERTY
WOODSTOCK, CONNECTICUT





EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
HEBERT SUBDIVISION
WOODSTOCK, CONNECTICUT

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

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

The ERT that field-checked the site consisted of the following personnel: Howard Denslow, District Conservationist, SCS; Michael Zizka, Geologist, Department of Environmental Protection (DEP); Rob Rocks, Forester, DEP; Marion Storch, Sanitarian, State Department of Health; Peter Demallie, Regional Planner, Northeast Regional Planning Agency (NECRPA); John Cimochowski, Environmental Planner, (NECRPA); and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

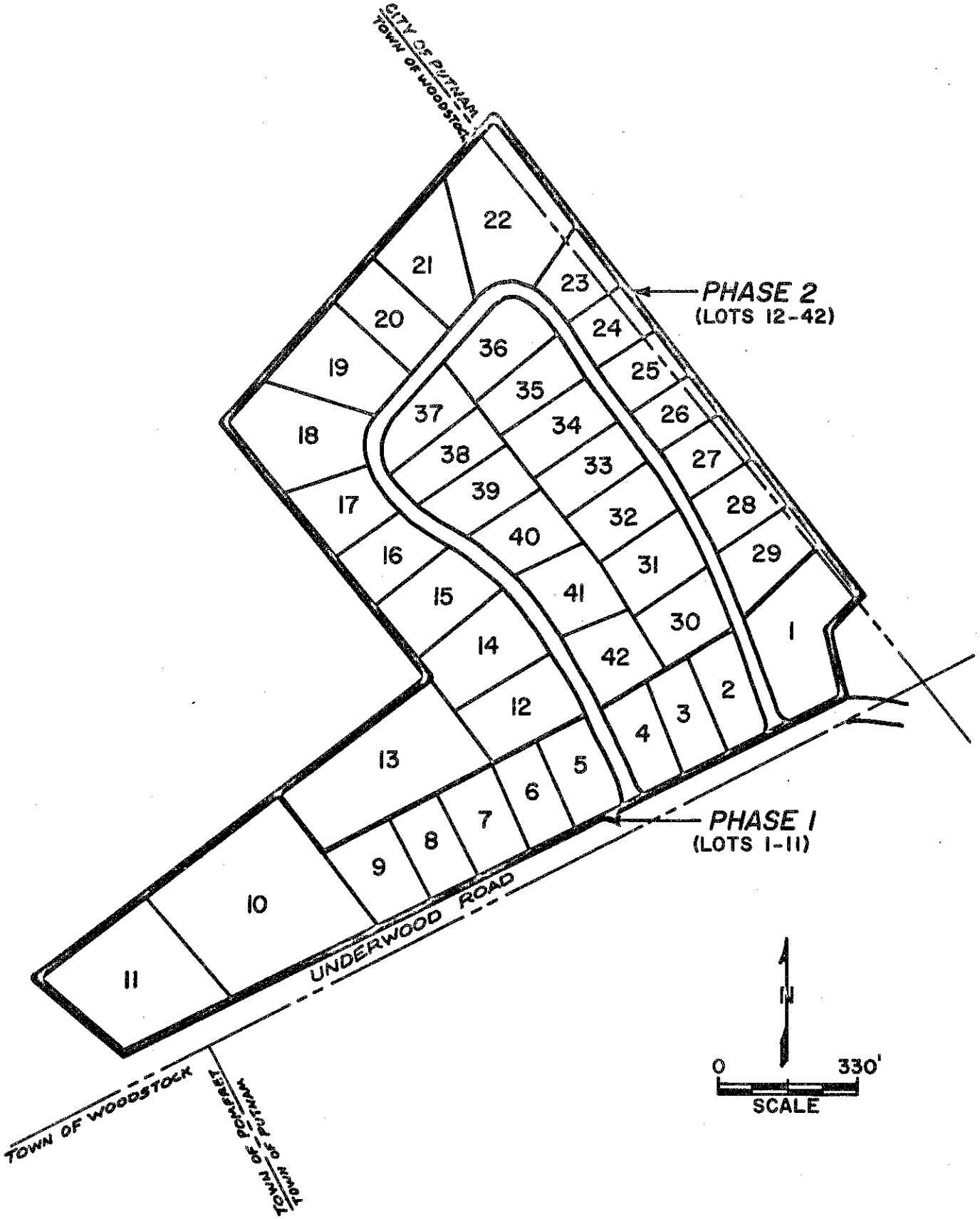
The Team met and field-checked the site on Thursday, May 24, 1979. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Woodstock. 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 Project Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require and additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.

Preliminary Subdivision Plan



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to review a 35± acre subdivision proposal located on the northern side of Underwood Road approximately 1/2 mile east of the intersection with Tripp Road in Woodstock's southeastern corner. The site runs along a portion of the common Woodstock-Putnam town line. The property was formerly in the private ownership of Gerard and Eleanor Daigle, but ownership was transferred to Roland Hebert during the course of the review process. Roland Hebert is also the developer for this parcel. Preliminary plans have been prepared by Albert Fitzback, R.L.S.

The developer has indicated an intention to subdivide the site into 42 lots ranging in size from approximately one half acre to two acres. Development has been planned in two phases. The initial phase includes 11 lots fronting on Underwood Road. The Woodstock Planning and Zoning Commission has approved lots 1 through 9; therefore, no comment will be made about these lots in this subdivision review. Lots 10 and 11, however, will be discussed, as a major portion of each lot is underlain with regulated wetland soils, and these lots had not been included in the Commission's approval.

The second phase of development concerns 31 lots in the northern and central sections of the site. The lot distribution is preliminary and subject to change based on environmental restraints. A loop road extending north from Underwood Road will provide access to these interior lots. All lots are proposed to be serviced by on-site wells and on-site septic disposal systems.

The site is diverse in topography and vegetation. All lots not yet approved (#10-42) are heavily wooded, except for portions of Phase II lots extending into the open field. Surface runoff from the total parcel is split either side of the high knoll in the Phase II area. The slope to the north end of Phase II drops steeply.

The Team is concerned with the effect of this proposal on the natural resource base of this site. Although certain limitations to development are evident, many can be overcome with proper engineering practices. Use of these engineering methods can be costly, however, making a proposal economically unfeasible for the developer.

The Hebert Subdivision as proposed will produce some increase in runoff from the site. There is also high sedimentation potential from this proposal. Sedimentation, however, can be minimized by leaving a 25-foot undisturbed vegetative buffer on either side of the watercourse or waterbody for protection. Steep slopes in the area of lots 19 through 22 could pose problems in driveway, home and septic system locations. A relocation of the access road to the south could help eliminate some of these problems. Due to underlying rock formations, well water may contain high levels of iron or manganese which will effect the taste and color of the water.

The nature of the soils on-site as well as the small lot size may lead to well pollution from septic effluent. (See Water Supply and Waste Disposal sections). Deep test pits should be done on Phase II lots to determine the potential of the lot to support a septic system.


Topography
Site Boundary
0
660'
scale
N
Water
RD
Harrisville
Harrisville
Golf Club
RD
300
400
400
RD
420
UNDERWOOD
400
450
AIRP
500
524

ENVIRONMENTAL ASSESSMENT

GEOLOGY

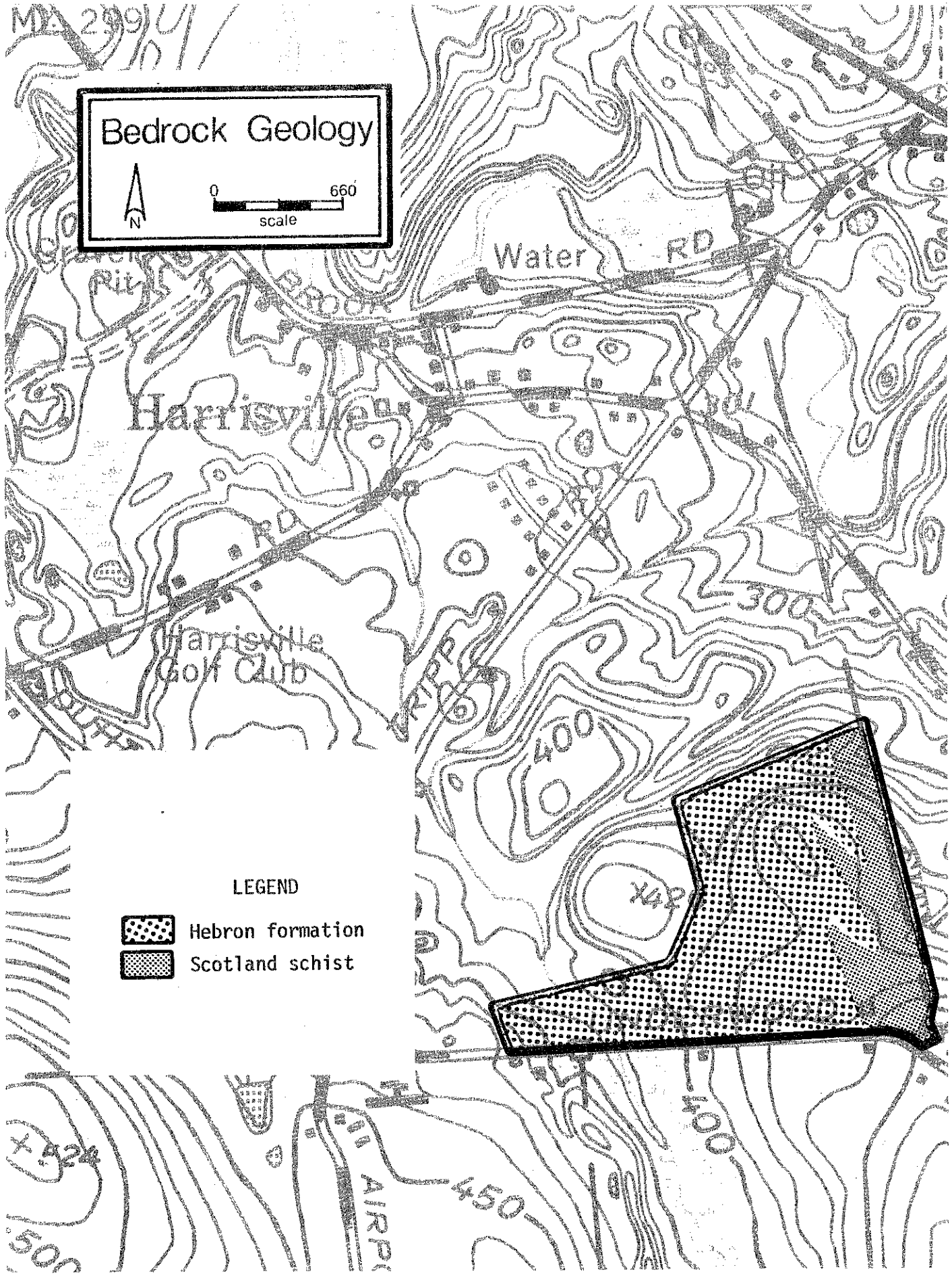
The Hebert property lies within the Putnam topographic quadrangle area. No geologic maps of that quadrangle have been published to date, but a preliminary copy of the bedrock geologic map, by H.R. Dixon, is open-filed at the Natural Resources Center of the Department of Environmental Protection. Outcrops were observed during the field review in the northern section of the site. Two types of rock are believed to underlie the site: a subunit of the Hebron Formation, and the Scotland Schist. The Hebron Formation unit consists of nonresistant, fine-to-medium-grained, thinly layered schists ranging in color from dark gray to greenish gray and purplish gray. The color differences reflect local variations in weathering and mineralogy. Important mineral constituents include quartz, biotite, and andesine, while less important minerals include muscovite, epidote, and actinolite. The Scotland Schist is a medium to dark gray, fine-to-medium-grained schist composed of quartz, muscovite, oligoclase, biotite, and garnet. The approximate distribution of the two bedrock units is shown in an accompanying illustration.

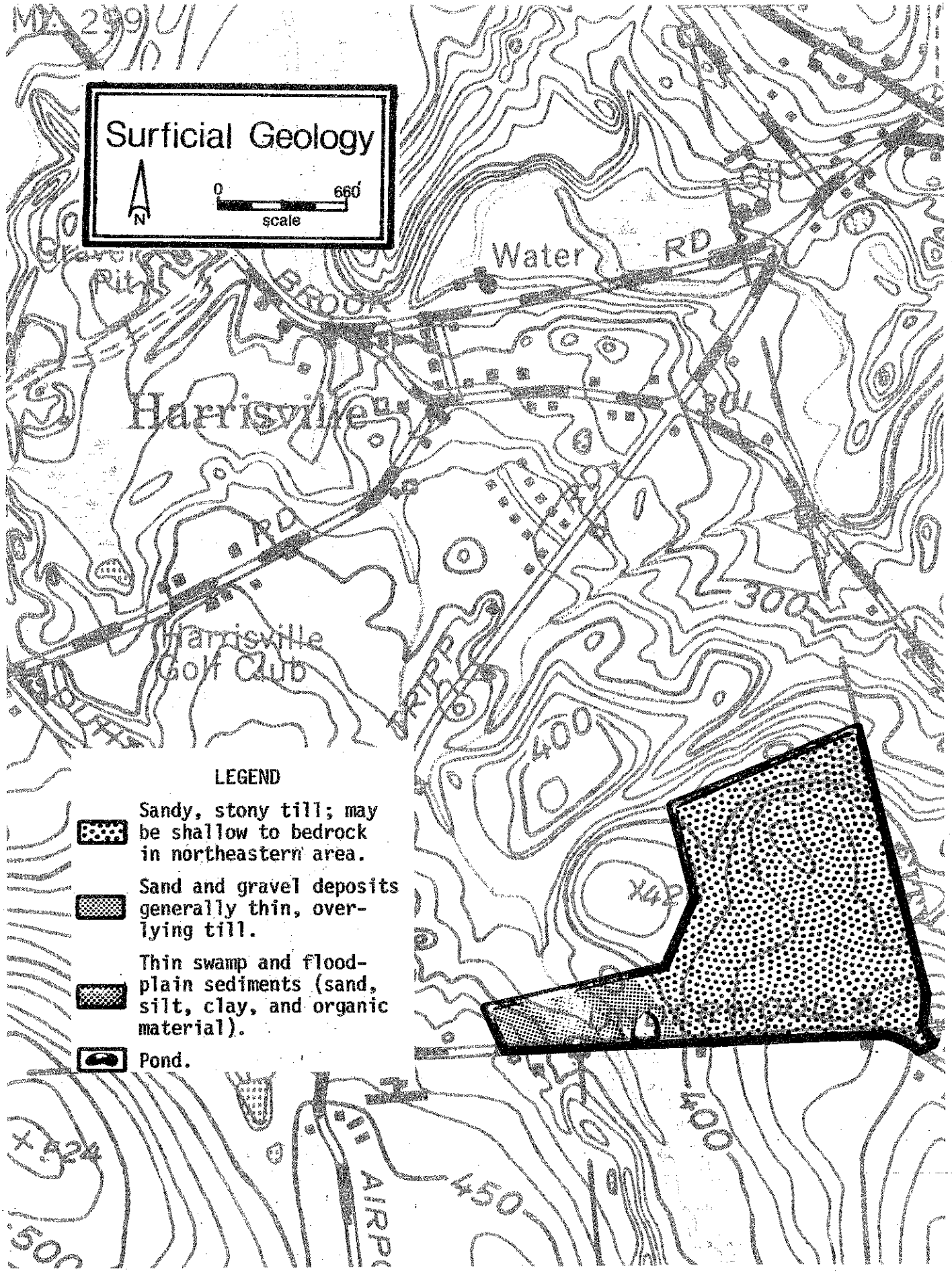
In lots 10 and 11, a small knoll borders an unnamed brook. Test pits in the vicinity record 5 feet of gravel over a "sandy pan". Immediately south of the site, a linear ridge extends approximately 2000 feet along the brook. Both the knoll and the ridge appear to be composed of sediments that were deposited by glacial meltwater, on or under ice. Hence, it is likely that small areas of poorly sorted sand and gravel may be found in other places along the brook. The presence of a "pan" in the test holes, however, seems to indicate that these meltwater deposits are thin and would be of very limited, if any, commercial value. The"pan" is probably composed of glacial till, which also forms the surface deposit in the eastern section of the site. Till, which was deposited directly by ice without substantial influence from meltwater, consists of rock particles and fragments of widely varying sizes and shapes. Although the till commonly has a sandy texture, it tends to become more compact at depth. An accompanying illustration shows the approximate distribution of till and sand and gravel deposits on the site.

HYDROLOGY

The Hebert property includes, in its western section, part of an unnamed brook that originates in a wetland south of the site. The brook flows northwest toward Tripp Road, curves sharply near that road, and then flows northeast to join Little River. The brook, which is approximately 5500 feet long, has a drainage area (watershed) of about 309 acres (see accompanying illustration). Approximately 31 acres of the Hebert site lie within this watershed.

Development of the subdivision as proposed will cause an increase in runoff on some parts of the site. In local areas that are presently wooded, this increase may be as much as 100 percent for a 5-inch rainfall (i.e. from about 0.98 inch to 2.04 inches of direct runoff). In the area that is presently cultivated, the establishment of lawns may offset the creation of impermeable surfaces (such as roofs and driveways) just enough to cause a slight decrease in runoff. Overall, runoff from the site for a given amount of precipitation would increase. The percentages of increase would be greater for smaller, more frequent storms than for


Bedrock Geology
N
0
660
scale
Water
RD
Harrisville
RD
Harrisville
Golf Club
300
400
400
450
LEGEND
Hebron formation
Scotland schist


Surficial Geology
N
0
660'
scale
Water
RD
Harrisville
RD
Harrisville
Golf Club
300
400
400
450
LEGEND
Sandy, stony till; may be shallow to bedrock in northeastern area.
Sand and gravel deposits generally thin, overlying till.
Thin swamp and floodplain sediments (sand, silt, clay, and organic material).
Pond.

large, infrequent storms. During periods of heavy rainfall, the upper part of the soil becomes saturated; hence, its ability to absorb additional rainfall is greatly decreased. The smaller storms, however, may cause severe erosion problems if they are intense, as during some summer squalls. The potential for such problems should therefore be addressed by an appropriate erosion-control plan. Particular care should be used in the wooded areas, where removal of trees in itself will generate much loose soil.

The additional runoff from the subdivision would cause increases in the peak flow rates of the brook. Estimates of peak discharges in the brook at its point of confluence with Little River were made for storms of 2-year, 25-year, and 50-year frequencies (all storms being of 24-hour duration). The estimates were made for present conditions, for conditions following development of the subdivision as planned, and for conditions assuming full development of the watershed into one-acre or one-half-acre lots. Results are shown in the accompanying table.

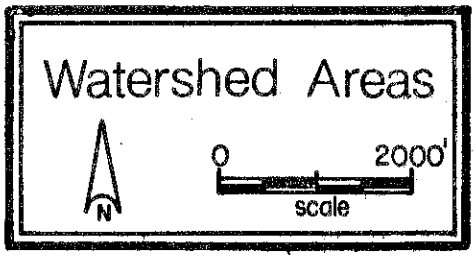
The peak flow increases shown in the table should be viewed in terms of both existing and potential flooding and erosion problems in the brook. Points of special concern are the size of the culvert that carries the brook under Sabin Street, and the area of the brook's closest approach to Tripp Road. If any flooding problems have occurred along the brook, the moderate increases in flow accompanying the Hebert development may exacerbate these problems to some extent. Otherwise, the most serious consideration may be sedimentation in the brook. A vegetative buffer along the brook would help to minimize this potential problem. Development of the entire watershed would produce tremendous peak flow increases that could cause serious flooding, erosion, and sediment problems in and of themselves. (Note: the latter comment addresses a concern that was raised by the town at the pre-review meeting, but it does not specifically concern the Hebert proposal).

Estimated present and future peak flows for the brook flowing through the Hebert property. All flows given are in cubic feet per second (cfs).

	2-yr., 24-hr. storm	25-yr., 24-hr. storm	50-yr., 24-hr. storm
Present conditions	11	164	266
Development of Hebert property only	15 (36% increase)	183 (12% increase)	291 (9% increase)
Residential development of the entire watershed	46 (327% increase)	305 (86% increase)	448 (71% increase)

VEGETATION

This thirty-four acre parcel is divided into five vegetation stands (see vegetation type map and vegetation type descriptions). Twenty-two acres of this property are forested and the remaining twelve acres are fields. Gypsy moth infestation and crowding has reduced tree health and vigor on part of this property. A fuelwood thinning in this area would, in time, help to restore tree health, vigor and stability.



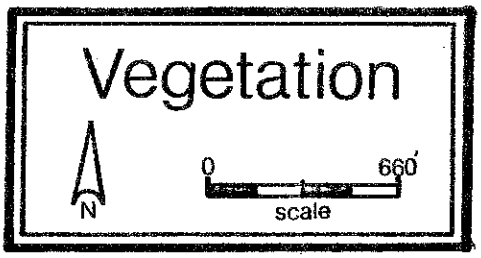
LEGEND

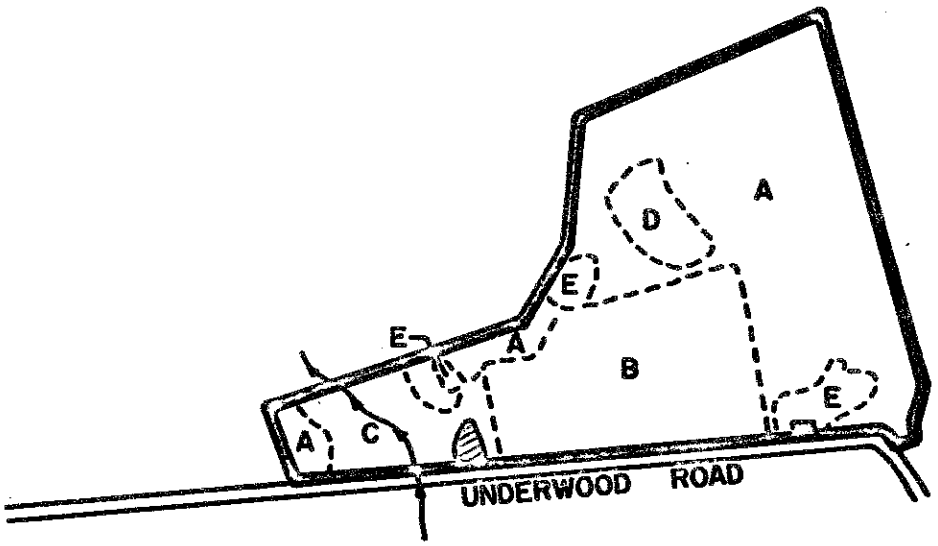
Watershed boundary

Site boundary

Stream course

Watershed boundary of the stream passing through the Hebert property, Woodstock.





LEGEND

- Road
- Property Boundary
- Vegetation Type Boundary
- Stream
- Pond
- Building

VEGETATION STAND DESCRIPTIONS*

STAND A	Mixed hardwoods, fully-stocked sapling to pole-size, 16 acres
STAND B	Open field, 10 acres
STAND C	Hardwood swamp, over-stocked pole-size, 4 acres
STAND D	Pine, fully-stocked pole to small sawlog-size, 2 acres
STAND E	Old field/disturbed area, under stocked, pole-size, 2 acres

* Seedling-size trees = less than 1 inch in diameter at breast height (d.b.h.)
Sapling-size trees = 1 to 6 inches in d.b.h.
Pole-size trees = 5 to 11 inches in d.b.h.
Sawlog-size trees = 11 inches and greater in d.b.h.

Vegetation Type Description

Stand A (Mixed hardwoods) - This sixteen-acre fully stocked stand is made up of crowded sapling to pole-size oak, black oak, and red maple. Scattered pole size white pine and pitch pine are also present along with occasional quaking aspen and gray birch. Many of the oaks have small unhealthy crowns, probably resulting from repeated partial defoliation by gypsy moth larvae. The understory is dominated throughout much of this stand by oak seedlings and chestnut sprouts, with scattered flowering dogwood, bluebeech, and maple leaf viburnum. Seedlings, huckleberry, clubmoss, cinnamon fern, Canada mayflower, and pink lady's slipper are the primary ground cover species present. Skunk cabbage, jack-in-the-pulpit, and trillium are growing in the valleys, where moisture levels are somewhat higher than in the surrounding areas.

Stand B (Open Field) - Corn has been cultivated on this ten-acre field in the recent past. At present grasses, legumes, and a variety of weed species are becoming established. A dense hedgerow of healthy seedling to sapling size cherry, red maple, white ash, and butternut, originating from stump sprout are present along the stone wall which borders Underwood Road. Shadbush, quaking aspen, speckled alder, grape vines, Virginia creeper, and poison ivy are also present in this hedgerow.

Stand C (Hardwood swamp) - Crowded, poor quality, pole-size red maple dominate this four-acre over-stocked stand. Spice bush, high bush blueberry, and arrowwood occur in the understory. Ground cover vegetation consists of skunk cabbage, cinnamon fern, sensitive fern, tussock sedge, and in the drier section of this stand, club moss.

Stand D (Pine) - Pole to small-sawlog-size white pine and pitch pine are present in this two-acre fully-stocked stand. Occasional pole-size black oak and black cherry also occur in this stand. Several years ago most of the larger sawlog-size pine were harvested. Assorted viburnum, cherry seedlings, and high bush blueberry form this stand's shrub layer. Club mosses and pink lady's slipper are the dominant species of ground cover vegetation present.

Stand E (Old Field/Disturbed Area) - Three areas totaling two acres are understocked with pole-size white pine, red maple, black oak, and sapling size bigtooth aspen and gray birch. Grasses and goldenrod are dominant, with hardwood tree seedlings becoming established.

Efforts should be made to preserve healthy trees in the forested parts of this tract to the maximum extent possible. These trees are valuable for aesthetic purposes shade and to some extent wildlife habitat. In addition, research has shown that trees can enhance the value of a house lot by as much as twenty percent.

Gypsy moth infestation has reduced the health and vigor of many of the oaks in Stand A (mixed hardwoods). The loss of tree vigor caused by continued or repeated defoliation makes trees more susceptible to further damage by forest insects, fungi, and other environmental stresses. Thinning which promote tree health and vigor may increase resistance to gypsy moth damage.

The high water table and saturated soils in Stand C (Hardwood swamp), limit vegetation to species which are tolerant of excessive moisture conditions. The red maple, which are the dominant tree species present in this stand, are shallow-rooted, of poor quality and slow-growing at this time. Management of this area for timber production is not economically feasible; however, reducing crowding through

fuelwood thinnings should result in a healthier, more stable stand.

Potential Hazards and Mitigating Practices

It should be recognized with the development of this property that trees are sensitive to mechanical injury and also to changes in soil aeration, moisture level, and physical composition within the entire area under their crowns. Such disturbances may cause trees (especially those of low vigor and poor health, in Stand A) to die within three to five years. Care should be taken during construction to minimize mechanical injury to trees and soil disturbances near trees. Where possible, trees should be saved in small groups or "islands". Trees that are to be saved should be temporarily marked to ensure their protection during project construction.

Windthrow may be a potential hazard in Stand C (Hardwood swamp). These trees have shallow root systems, which are unable to become well-anchored in the saturated soils. Large openings, which may allow wind to flow through, rather than over this stand will increase the windthrow potential and shold be avoided if possible.

Suggested Management Techniques

The trees in Stand A, as mentioned earlier, are declining in health and vigor, due at least in part of defoliation by gypsy moth larvae. In this condition, trees are very sensitive to environmental stresses, including the changes occuring with development. A fuelwood thinning in this stand removing approximately one-third of the stems will reduce competition and in time allow residual trees to become healthier and more stable. This thinning, if implemented, should focus on removing unhealthy, poor-quality trees, and those trees which are directly competing with healthy, high-quality trees.

A state employed Service Forester could help the owner mark the trees which should be removed for the thinning in Stand A.

SOILS

A detailed soils map of this site and detailed soils descriptions are included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320'/inch scale to 660'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitation chart indicates the probable limitations for each of the soils for on-site sewerage, buildings with basements, buildings without basements, streets and parking, and landscaping. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large 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. Know Your Land: Natural Soil Groups for Connecticut can also give insight to the development of the soils and their relationship to the surficial geology of the site.

Soils typical of the Hebert site include the Canton and Charlton series, the Sutton series, the Ninigret series, the Hinckley series and Adrian-Palms mucks.

The Adrian-Palms series is a regulated wetland soil under Public Act 155.

3B Canton & Charlton fine sandy loams, 3 to 8% slopes. Canton and Charlton are well drained soils developed in upland till normally deeper than 5 feet. These soils are rapidly permeable in the subsoil but slowly to very slowly permeable layers may be present below 60 inches. The water table normally is below 60 inches during most of the year. The Canton and Charlton soils are naturally stony and contain few to many stones throughout the soil. Gravel size rock fragments generally make up 10 to 30 percent of the surface and subsoil. Most use problems are related to slope and stoniness. These soils are gently sloping.

3XB Canton & Charlton very stony fine sandy loams, 3 to 8% slopes. Canton and Charlton are well drained soils developed in upland till normally deeper than 5 feet. These soils are rapidly permeable in the subsoil but slowly to very slowly permeable layers may be present below 60 inches. The water table normally is below 60 inches during most of the year. The Canton and Charlton soils are naturally stony and contain few to many stones throughout the soil. Gravel size rock fragments generally make up 10 to 30 percent of the surface and subsoil. Most use problems are related to slope and stoniness. These soils are gently sloping. Stones cover 1 to 3 percent of the surface area.

3MC Canton & Charlton extremely stony fine sandy loams, 3 to 15% slopes.
3MD Canton & Charlton extremely stony fine sandy loams, 15 to 35% slopes. This gently sloping to sloping unit of Canton and Charlton well drained soils occur in patterns too intricate to separate in mapping at the current scale. Each mapping unit may contain an individual soil or percentage of each of the two soils. More than 3 percent of the surface is covered with stones. In general, these soils are normally deeper than 5 feet. These soils are rapidly permeable in the subsoil but slowly to very slowly permeable layers may be present below 60 inches. The water table normally is below 60 inches during most of the year. The Canton and Charlton soils are naturally stony and contain few to many stones throughout the soil. Gravel size rock fragments generally make up 10 to 30 percent of the surface and subsoil. Most use problems are related to slope and stoniness.

41XB Sutton very stony fine sandy loam, 3 to 8% slopes. Sutton are moderately well drained soils developed in upland till normally deeper than 5 feet. These soils are moderately permeable in the subsoil but slowly to very slowly permeable layers may be present below 60 inches. The water table normally rises to within 15 to 20 inches of the surface during the winter and spring months. The Sutton soils are naturally stony and contain few to many stones throughout the soil. Most use problems are related to the seasonal high water table and stoniness. This soil is gently sloping. Stones cover 1 to 3 percent of the surface area.

45B Ninigret fine sandy loam, 3 to 8% slopes. Ninigret are moderately well drained soils developed in silty water deposits, about 24 inches deep, over coarse-textured, stratified sands and gravels. These soils, normally deeper than 10 feet, are located on terraces above the present overflow of large streams. They are moderately permeable above the sands and gravel substratum, which are rapidly permeable. The water table normally rises to within 20 inches of the surface during the winter and spring months. Most use problems are related to the seasonal high water table. This soil is gently sloping.

91 Adrian and Palms mucks.* Adrian and Palms soils are deposits of peats and muck not exceeding 52 inches in depth, found in poorly drained areas. They are the remains of reeds and sedges, sphagnum moss, or trees and shrubs. They are underlain by gray sand or stratified sands and gravel.

GRADED CONDITIONS/FOUNDATION DEVELOPMENT

Field investigation of lots #10 and #11 reveal feasible locations for homes, onsite septic leach systems and driveways - all near, but apparently out of the wetland. Engineered systems would be needed. The existing shallow pond at the eastern side of lot #10 might be considered useful for fire protection. This would require deepening, and possible installation of a dry fire hydrant. A culvert should be installed beneath the access drive to allow for pond overflow to the stream. The invert elevation of this culvert should be low enough to prevent driveway flooding. The elevation of the stream level is low enough presently not to flood the higher building elevation on lot #11. However, north of lot #11 the stream must continue its course and not be constricted or it may conceivably flood back on lot #11 and even #10. Building in a wetland is not condoned. The Commissions should have the wetland boundary flagged in the field by soil scientists for reference.

These reference points would enable a building inspector to check on and prevent disturbance of the wetland area during construction. Disturbing as little forested area as possible on these lots, especially leaving a good natural buffer to the stream is important if building use is allowed. Adequate stabilization of disturbed ground, fill, etc. with temporary or permanent seedings, mulch (wood chip) cover, hay bales, etc. would be important to protect the integrity of the stream and wetland.

In phase II although the layout is very preliminary, general comments can be made. Onsite investigation of the soils reveals less serious limitations than anticipated. The slope is obviously steep to the north. The location of the road could be moved southward and upslope to avoid placing driveways, homes, and septic systems on grades of 15-25 percent. This would involve proposed lots #19-22. Bedrock in this area was seen as possibly presenting a problem for basement and septic system installations. Enlarging lot sizes and reducing the number of lots will be necessary to "fit" building sites to the topography.

It would be possible to develop a storm water retention basin in the vicinity of proposed lot #18 and lots #21, 22. Installation is encouraged, at least on a temporary basis during intensive development, if storm drainage is outletted in these areas. Storm drainage facilities including retention basins for runoff and sediment should be installed along with roads before uphill land is disturbed for building construction. The peak storm drainage discharge from the development should ideally be limited to the peak ten (10) year - twenty four hour runoff, prior to development, by the retention basins (see "Erosion and Sediment Control Regulations" in Appendix B.

A sizeable portion of phase II rests on Sutton soil. Although lacking a hardpan, seasonal wetness is a problem. Potential drainage problems with lots # 13-18 should be anticipated. Footing drains, careful surface grading - (sloping away from bulkheads, etc.) will be necessary. Also, road drainage systems should be carefully engineered.

* Designated wetland soil by P.A. 155

The "Erosion and Sediment Control Handbook" developed by the Soil Conservation Service for Connecticut should be used as a guide and reference for specific applicable measures. The SCS staff of the Conservation District located in the Agricultural Extension Center in Brooklyn will provide additional assistance in evaluating proposed erosion and runoff control measures upon request.

WATER SUPPLY

Water is proposed to be supplied to the site by individual on-site wells. No substantial sand-and-gravel deposits appear to exist within the site, so each well probably will have to tap bedrock. Water travels through crystalline bedrock by means of fractures within the rock. The yield that is possible from a given well depends upon the number and the size of the fractures that the well penetrates. Since fractures are irregularly spaced in bedrock, no clear way of predicting the yield from a bedrock well at a given site exists. However, in Connecticut Water Resources Bulletin No. 8, it is estimated that at 85 percent of the sites in the Quinebaug River basin, a well penetrating 100 feet of bedrock could yield 3 gallons per minute or more, which is enough for an average home. Bedrock-based wells with high yields (i.e. greater than 20 -gpm) are not common.

Because of the types of bedrock that underlie the site, it is possible that water derived from local wells would contain moderate to excessive concentrations of iron and manganese. Certain filtration methods are available to alleviate many such problems. Another concern is the density of the proposed subdivision.

It has been recommended that "residential development in eastern Connecticut should not occur at densities greater than an average of one residence per acre on well-drained sites in areas covered by till." *Although the soils on the site seem favorable, in general, for renovation of most harmful constituents of septic effluent, nitrates are not removed by the soil particles and hence require dilution by clean groundwater. The one-acre-per-residence recommendation was calculated by Holzer in response to the need for such dilution. Although it is not necessarily essential to have a one-acre density in all areas, such a density would be a reasonable safety precaution.

WASTE DISPOSAL

Preliminary plans indicate that all lots are to have on-site water supply wells and subsurface sewage disposal systems.

Lots #1 - 9 have been approved by the Planning and Zoning Commission, and lots #10 and #11 have had deep observation pits dug, but, as of the field review, percolation tests had not been done for lot #10.

Lots #10 and 11 are located in the western corner of the property. Each consists of several acres. A pond is located in the southeast corner of lot #10, and due to topography, drainage from Underwood Road and portions of lot #9 drain into the pond. A stream, with associated wetlands, flows through both lots #10 and 11 near the boundary between them.

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* Holzer, T.L., 1975, "Limits to Growth and Septic Tanks", in Water Pollution Control in Low Density Areas, W.J. Jewell and R. Swan, eds., Univ. Press of New England, p.71.

Deep soil test pits were observed by the Northeast District Department of Health on June 27, 1978, and the soil information is as follows:

Lot #10: 0" to 7": topsoil: 7" to 24": sandy loam: 24" to 60": gravel; and 60" to 108": sandy pan. Groundwater came in at 104" and soil mottling at 68".

Lot #11: 0" to 9": topsoil: 9" to 30": sandy loam: 30" to 60": gravel: and 60" to 80": sandy pan. Groundwater was found at 70" and mottling at 60". A percolation test on lot #11 yielded a percolation rate of 6 - 11 minutes per inch.

Both lots #10 and #11 appear to have areas of soil suitable for the installation of subsurface sewage disposal systems in the vincinity of the deep test holes done on these lots.

The stream, pond and associated wetlands should be avoided. The extent of these wetlands should be carefully determined to make certain there is sufficient room on each lot for a house, on-site well, septic system, and 100% reserve area, while still maintaining the minimum separating distances set by the Public Health Code. The wells and all parts of the subsurface sewage disposal system should be kept as far as possible from the stream, pond and wetlands.

There was no percolation test data recorded for lot #10. If not already done, percolation tests, witnessed by the Northeast District Department of Health, should be run on both lots, to determine the size of the leaching systems.

The subsurface sewage disposal systems on lots #10 and #11 should be kept on a high elevation to avoid contamination of the groundwater level.

The northern part of the property is shown as being divided into 32 lots on a preliminary sketch. These lots range from 25,000 to 40,000 sq. ft. in size. A loop road is proposed to connect these lots with Underwood Road. Lots would be located both inside and outside the loop. Most of this section is located on the relatively flat top of a knoll. The exception is the northern boundary which contains some steep slopes. No soil test data has been recorded for this part of the property.

Lots #12 through #34 are tentatively shown on a preliminary sketch of this area. Soil testing must be done to give a more definite idea of where development can occur. It does not appear feasible, at this point, for this section to be subdivided into as many lots as shown on the preliminary sketch. There are problem areas in some of the lots that would either require avoiding that area entirely or increasing the lot size in order to accommodate a sub-surface septic disposal system.

It has been the experience of the Northeast Regional office of the State Department of Health that it has been extremely difficult to provide on-site water supply wells, subsurface sewage disposal systems, and 100% reserve area on lots containing 25,000 sq. ft. due to the separating distances required by the Connecticut Public Health Code.

The area adjoining the northern boundary of the property contains some very steep slopes. These slopes should definitely be avoided for any type of construction, or for the installation of septic systems. This involves the back sections

of what appears to be the proposed lots #19, 20, 21, 22, and possibly several others. Sufficient level area might be provided by combining lots or extending lot lines into the center of the entire property. This would necessitate moving the position of the road and also combining lots in the center of the road loop.

Gentler slopes are found on the northeastern side of the back section. Engineered plans may be advisable for septic systems if the sloping sections of these lots are used. All wells should be located uphill from the septic systems, including those on other lots.

CONFORMITY TO PLANS OF DEVELOPMENT

The Northeastern Connecticut Regional Plan of Development (land use component) has assigned the City of Putnam and its immediate environs "primary urban center" status, a designation shared with Danielson. While eventually (when public sewerage is available) the Hebert subdivision in Woodstock's southeastern corner will fall into this primary urban center category as an extension of Putnam's urban area, the Regional Plan indicates that no such sewered area (present or future) should have a long-term density of less than two dwelling units per acre. As proposed on the preliminary subdivision plan map, lot sizes are generally one-half acre, save for the lots farthest into the lot's interior. These latter lots would be somewhat removed from Underwood Road, and sewer trunk lines as well; thus their larger size would not appear to conflict with the Regional Plan. Indeed, until sewer service is provided, larger lots are more desirable for on-site subsurface waste disposal. It is unfortunate, however, that this preliminary subdivision plan does not cluster the proposed lots, thereby providing vacant tracts for future "in-filling" when public sewer service is provided, as recommended in the Regional Plan. Clustering could also guarantee open space areas when they might not otherwise be available to future generations as the land development intensity increases.

Relative to the local plan, this proposal fails to conform to the Woodstock Plan of Development. This plan has assigned this site to future industrial park uses. However, the Woodstock Planning Commission has proceeded to update this plan and may change this site's classification. No municipal land use controls have been instituted in Woodstock with the potential for implementing the Town Plan. Until zoning is adopted, the plan remains ineffectual.

CONFORMITY TO REGULATIONS

The subdivision plan map, as submitted to the team, was a preliminary or Class "D" survey. An "A-2" survey is required by the Woodstock Subdivision Regulations, complete with sufficient information to permit a comprehensive review. Other materials which will be required include the engineer's plan and profile drawings of proposed public improvements, such as streets and drainage facilities. Regional Planning Agency staff would be pleased to review these plans upon request for conformity to regulations and design once they have been submitted to the Planning and/or Wetlands Commissions. To date, submissions for this proposal have been inadequate for a detailed engineering and planning review.

PLANNING CONCERNS

At the time of the subdivision review, specific soil test data for only lots #1 - 11 was available. Reconnaissance-type observation pits had, however, been excavated in the farther reaches of the property. Due to limited plan detail, site work, and testing, comments referring to review of this subdivision cannot be specific to any particular lot with the exception of lots #10 and 11.

Overall, the property consists mainly of moderately sloping land which should not pose a problem toward development nor create situations where proper erosion control cannot be maintained. Lot sizes in terms of proposed tracts under one acre in size should be dependent upon septic system and water supply requirements. The northeast corner of the proposed subdivision contains a land surface dotted with rock outcrops. Results of soil tests may indicate that the lots may need to be enlarged should ledge or large bounders be present. Some,300 feet off Underwood Road north of lots #2 through 4, are located on wet areas prone to surface water flooding, which may affect construction of lots in that vicinity. The northeast section of the property, based on a preliminary plan dated March 6, 1979, displays the most slope and will require greater effort in terms of erosion control. In addition, by field review, the western section of the property containing lots #14-18 inclusive has steeper slopes as well.

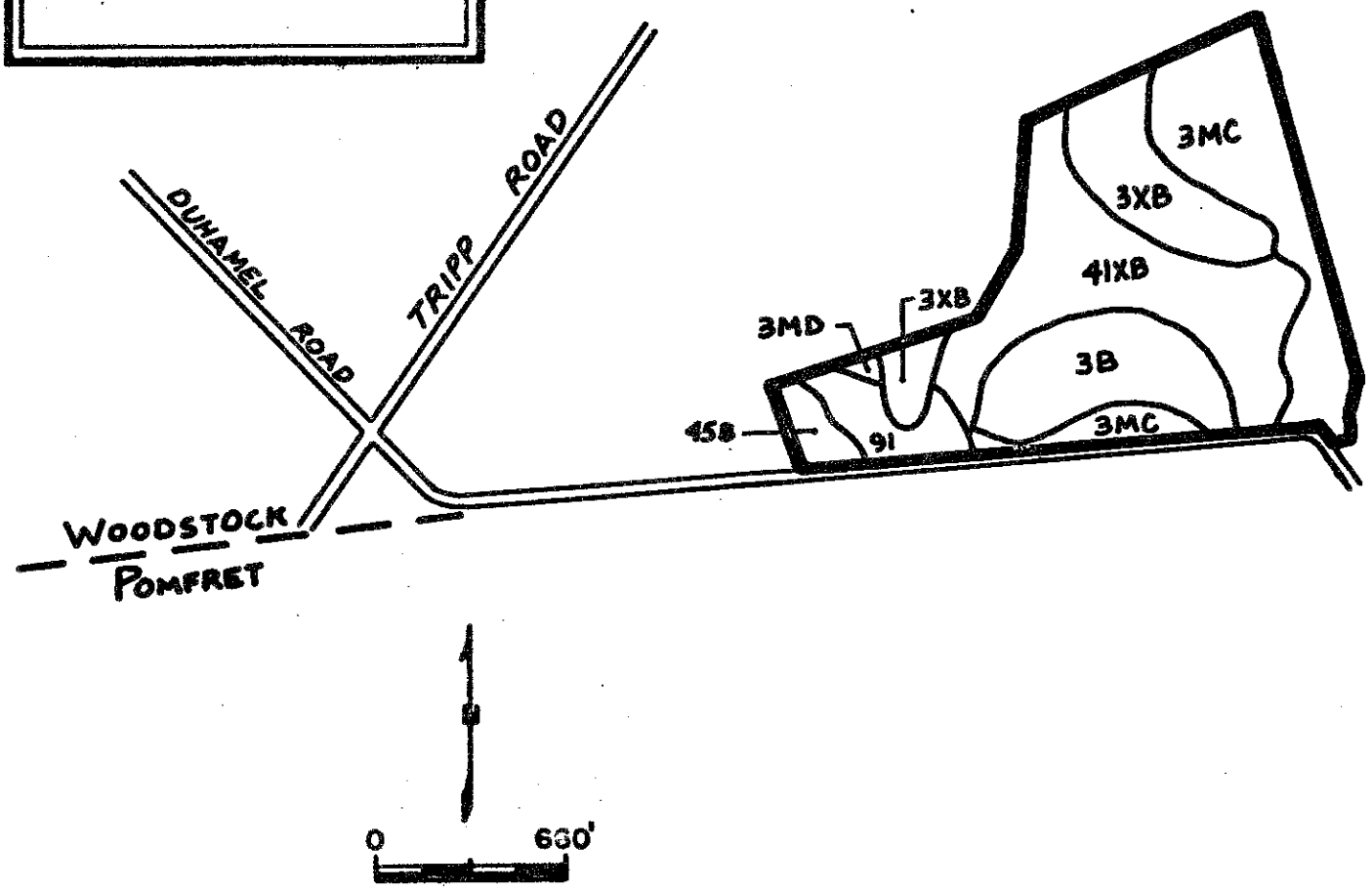
Concerning lot #10, proper setback from the pond along Underwood Road must be maintained regarding the construction of the water supply well, proposed dwelling, and septic system. Measures should also be taken to prevent erosion and sedimentation to the pond from construction activity.

In summary, as only preliminary information in regard to survey and soil testing is available, the review of this proposed subdivision must be general and not detailed to specific locations on the property. It may be necessary to conduct a more in-depth review of the remaining unapproved lots of the subdivision when soil testing and more detailed survey information are produced.

Appendix

Soils

DAIGLE PROPERTY
WOODSTOCK, CONNECTICUT



This is an enlargement from the original 1,320'/inch scale to 660'/inch.

SOIL LEGEND

Soil Map Symbol	
3B	Canton & Charlton fine sandy loams, 3 to 8% slopes.
3XB	Canton & Charlton very stony fine sandy loams, 3 to 8% slopes.
3MC	Canton & Charlton extremely stony fine sandy loams, 3 to 15% slopes.
3MD	Canton & Charlton extremely stony fine sandy loams, 15 to 35% slopes.
41XB	Sutton very stony fine sandy loams, 3 to 8% slopes.
45B	Ninigret fine sandy loam, 3 to 8% slopes.
*91	Adrian and Palms mucks.
*	Designated wetland soil by P.A. 155

Gerard & Eleanor Daigle
Underwood Road
South Woodstock, Connecticut

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations: On-Site Sewage	Dwellings with Basements	Landscaping and Lawns	Roads and Streets
Canton & Charlton	3B	6	.18	----	1	1	1	1
Canton & Charlton	3XB	5	.15	Large stones	2	2	2	2
Canton & Charlton	3MC	9	.26	Large stones	3	3	3	3
Canton & Charlton	3MD	1	.03	Slope, large stones	3	3	3	3
Sutton	41XB	7	.20	Wetness, large stones, frost action	3	3	2	2
Ninigret	45B	1	.03	Wetness, frost action	3	3	1	2
Adrian & Palms	*91	3	.09	Wetness, floods, low strength, excess humus	3	3	3	3
		34	100%					

* Designated wetland soil by P.A. 155

1-slight; 2-moderate; 3-severe

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

EROSION AND SEDIMENTATION CONTROL PLANS. A plan for erosion and sedimentation control covering all proposed excavation, filling and grade work for improvements shall be required, unless waived by the Commission, for review and approval prior to the start of any work. Said plan shall be prepared and sealed by a Professional Engineer registered in the State of Connecticut.

1. GENERAL REQUIREMENTS FOR EROSION CONTROL. Such plans when required shall show proper measures to control erosion and reduce sedimentation as set forth in the "Erosion and Sediment Control Handbook" published by the U.S.D.A. Soil Conservation Service, Storrs, Connecticut, 1976, as amended. All underscored terms and phrases used herein refer to specifications contained in said handbook. Such Erosion and Sedimentation Control Plan shall consist of:

(A) A Construction Plan showing property lines, wetlands streamcourses, topography, and all proposed roads and other improvements.

(B) Location of areas to be stripped of vegetation and other exposed or unprotected areas.

(C) A schedule of operations to include starting and completion dates for major development phases, such as land clearing and grading, street, sidewalk, and storm sewer installation, and sediment control measures.

(D) Seeding, sodding, or revegetation plans and specifications for all unprotected or unvegetated areas.

(E) Location and design of structural sediment control measures, such as diversions, waterways, grade stabilization structures, debris basins, etc.

(F) General information relating to the implementation and maintenance of the sediment control measures.

2. EXCAVATIONS, FILLS, AND GRADING

(A) An absolute minimum of existing vegetative cover shall be disturbed during the construction period.

(B) All disturbed areas shall be properly and neatly graded and shaped as soon as possible. Final grading shall include removal of all large rocks, stumps, debris, and all other deleterious materials from the finished surface. Permanent Vegetative Cover shall be established as soon as practicable upon achievement of final grade.

(C) Cut and fill slopes shall not be steeper than 3:1 unless stabilized by a retaining wall or cribbing, except as approved by the Commission under special conditions.

(D) At the toe of all cut and fill slopes in excess of ten (10) feet in height, Baled Hay or Straw Erosion Checks shall be installed.

(E) All disturbed areas shall be protected from potentially erosive runoff from up-slope areas by means of Diversions, Benches, or other acceptable means.

(F) Cut and fills shall not endanger adjoining property.

(G) Fill shall be placed and compacted so as to minimize sliding or erosion of the soil.

(H) Grading shall not be done in such a way so as to divert water onto or impound water on the property of another landowner without the written consent of that landowner.

(I) Fills shall not encroach on natural watercourses or constructed channels.

(J) During construction, necessary measures for dust control shall be exercised.

3. WETLANDS AND WATERCOURSES.

(A) Whenever possible, storm drainage facilities shall discharge to a watercourse. In special cases where this is not possible, the use of Level Spreaders or other outlet arrangements may be permitted.

(B) When it is planned to discharge storm drainage facilities, whether by pipe or waterway, to a streamcourse, supporting calculations shall be provided to demonstrate that said streamcourse and downstream structures can adequately handle any additional flow contributed by the development. If improvements to the streamcourse or structures are proposed to accommodate increases in runoff, these improvements shall be properly designed and supported by calculations.

(C) When the total development within a drainage area to be disturbed is equal to or exceeds five (5) acres, a Sedimentation Basin may be required to trap and retain sediment and debris.

(D) Whenever the size of the development equals or exceeds five (5) acres, the peak storm drainage discharge from the development shall be limited to the peak ten (10) year-twenty four (24) hour flow prior to development by the use of a Detention Basin.

(E) When Grassed Waterways are installed in lieu of pipe, they shall be protected against erosion by the use of Mulch Materials, Baled Hay Erosion Checks and/or Log and Hay Check Dams placed at appropriate intervals. Waterways shall be properly designed and calculations showing the method of arriving at size, slope, and embankment protection shall be submitted.

(F) Grading equipment will not be allowed to cross streams except by means of bridges and culverts or other methods as approved by the commission.

4. IMPLEMENTATION PROCEDURES. In submitting the Erosion and Sedimentation Control Plan, the applicant shall comply with the following:

(A) The Development Plan shall be fitted to the topography and soils so as to create the least erosion potential.

(B) Only the smallest practical area of land shall be exposed at any one time during development.

(C) When land is exposed during development, the exposure shall be kept to the shortest practical period of time.

(D) Where necessary, temporary vegetation and/or mulching shall be used to protect areas exposed during development.

(E) Provisions should be made to effectively accommodate the increased runoff caused by changed soil and surface conditions during and after development. Computations for runoff shall be in accordance with methods described in "Technical Release No. 55, Urban Hydrology, Engineering Division", SCS, U.S.D.A., January 1975, as amended.

(F) The permanent final vegetation and structures shall be installed as soon as practical in the development.

5. CONDITIONS RELATING TO EROSION CONTROL.

(A) The Commission may refer these plans to the Windham County Soil and Water Conservation District or other agency or person for consultive technical assistance.

(B) Three (3) sets of plans for the control of erosion and sedimentation, if required, shall be submitted to the Commission, or its duly authorized representative, at the time the Final Drawings are submitted.

(C) Measures to be taken to control erosion and sedimentation, if required, may be described and provided for in construction agreement and the estimated cost of accomplishing such measures may be covered in a performance bond acceptable to the Commission.

About the Team

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

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.