ENVIRONMENTAL REVIEW TEAM REPORT

COLONIAL HILL ESTATES
NEWTOWN, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION AND DEVELOPMENT AREA

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On

COLONIAL HILL ESTATES
NEWTOWN, CONNECTICUT

MARCH 1979

King's Mark Resource Conservation & Development Area

Environmental Review Team
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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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Funding Provided By

CONNECTICUT STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION
Stanley J. Pac, Commissioner

Policy Determined By

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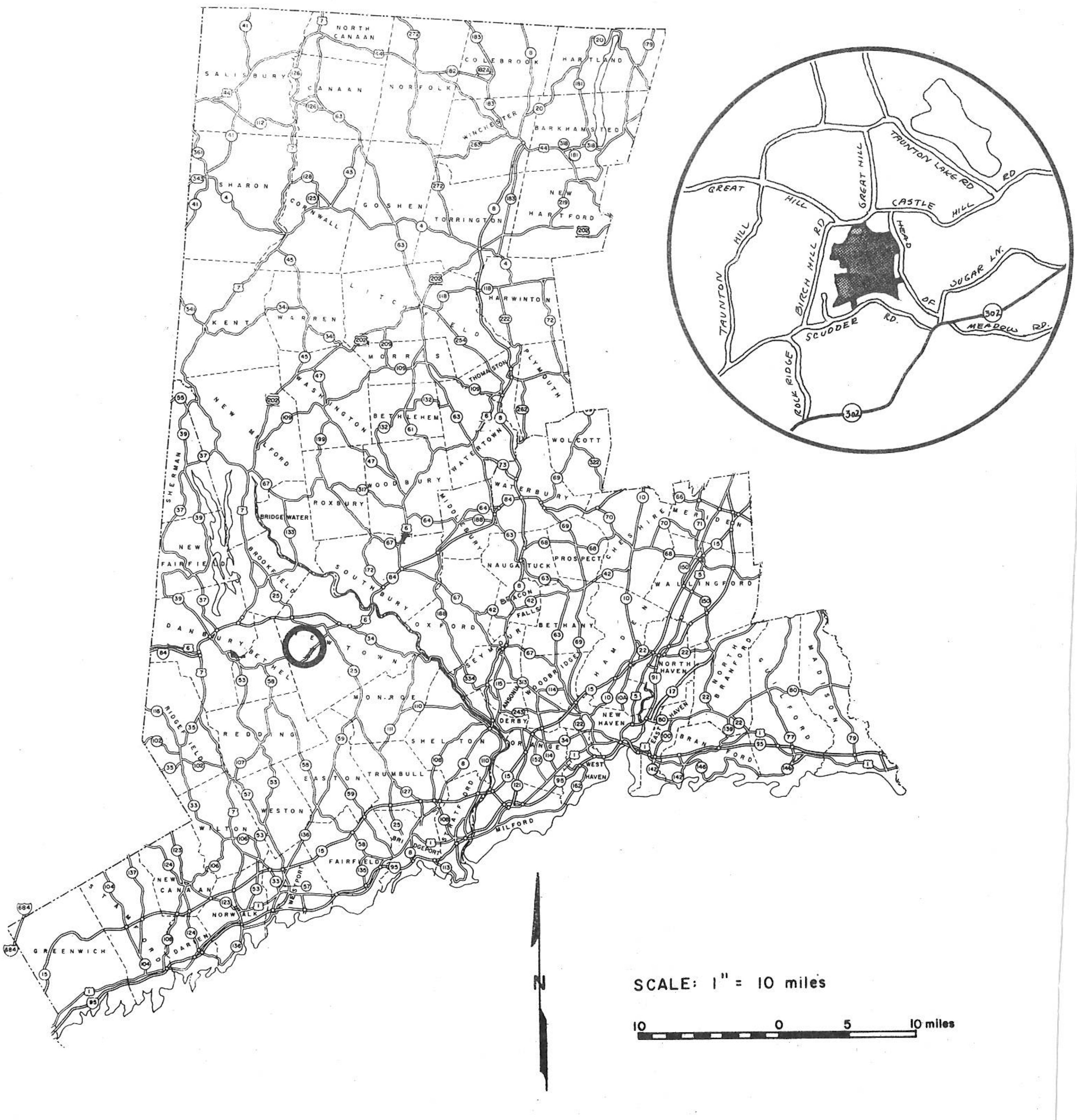

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ON
COLONIAL HILL ESTATES
NEWTOWN, CONNECTICUT

I. INTRODUCTION

The Town of Newtown, Connecticut is presently reviewing an application for subdivision of ± 100 acres of land in the west central portion of town. The proposed subdivision, known as "Colonial Hill Estates", would create 58 house lots of 1+ and 2+ acres in size (see Figure 1). Each lot would be serviced by an on-site well and septic system. Access to the parcel would be provided by newly constructed roads off Great Hill Road, Head of Meadow Road, and Scudder Road. Development plans indicate that ± 20.5 acres of the 100 acre site would be left in its natural condition as open space.

The developer's preliminary subdivision plan (1" = 100' scale) includes a map showing lot and road layout, existing contours, inland wetlands as mapped by a soils scientist, and the approximate location where percolation tests and deep observation holes have been conducted. The developer has indicated he will be initially applying for approval of lots 1-19 (see Figure 1). Following subdivision approval of these "phase one" lots, subsequent application for subdivision approval will be made for the remaining lots.

The Town of Newtown requested the assistance of the King's Mark Environmental Review Team (ERT) to help the town in analyzing the proposed development. The ERT was asked to identify the natural resources of the site and to discuss the probable effect the subdivision would have on the natural environment. Specific concerns raised by the town included the impact of the project on soils and hydrology; and the suitability of the land for on-site water supply development and sewage disposal.

The ERT met and field reviewed the site on Tuesday, January 23, 1979. Team members for the review consisted of the following:

David Thompson..... District Conservationist....U.S.D.A. Soil Conservation Service

Michael Zizka ......Geohydrologist.............State Department of Environmental Protection

Robert Rocks........Forester...................State Department of Environmental Protection

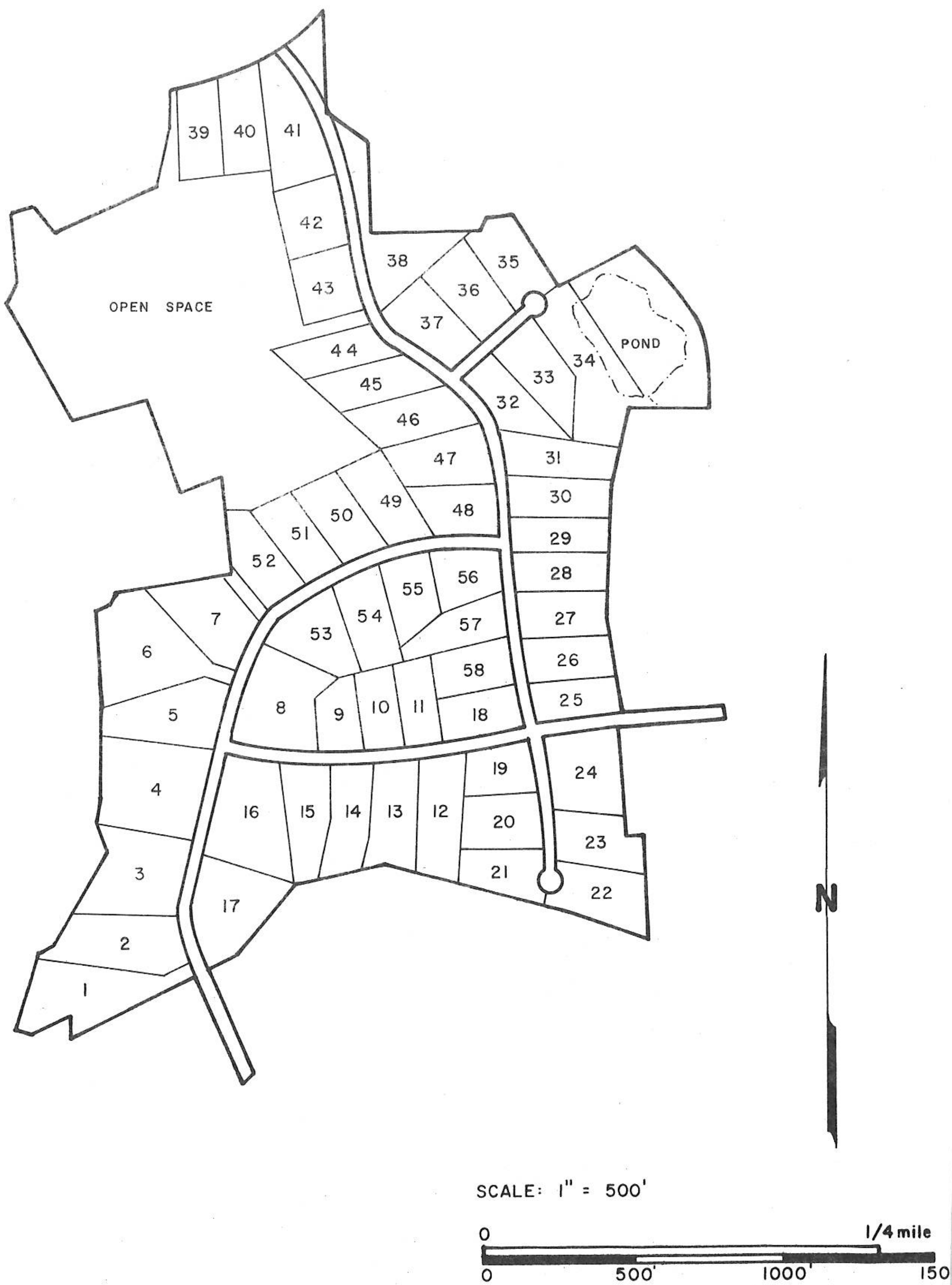
Roberta Hampton.....Archaeologist..............American Indian Archaeological Institute

Frank Schaub........Sanitary Engineer..........State Department of Health

John Chew...........Regional Planner...........Housatonic Valley Council of Elected Officials

FIGURE I.

SIMPLIFIED SITE PLAN



Prior to the review day, each team member was provided with a summary of the proposed project, a checklist of concerns to address, a soil survey map, a soils limitation chart, and a topographic map of the area. Detailed site plans and results of soil testing (percolation tests, deep observation holes) prepared by the developer as part of his application were made available to the team the day of the field review. 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 Newtown and the landowner/developer in making decisions regarding the future of this parcel of land.

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.

* * * * *

II. SUMMARY

- *Most of the site is underlain by upland soils over compact glacial till, upland soils over friable to firm glacial till, and upland soils rocky and shallow to bedrock. Development limitations associated with these soils are related to shallowness, high water table, slope, and hardpan. Special consideration in septic system design, home site selection, and road construction is essential over much of the site. With implementation of the proposed project, it is recommended that an erosion and sediment control plan for the entire development process be prepared and followed.*

- *The tract has six distinct vegetation types with 82 acres of the ± 100 acre tract forested. The hardwood swamp areas are particularly fragile and development in and around these areas should be restricted to preserve the quality of the wetland. The mixed hardwood stands which are fully-stocked and over-stocked would benefit by a thinning operation directed at removing the poorer quality trees.*

- *Development will increase the runoff to the brooks surrounding the site for a given amount of precipitation. This additional runoff, in turn, will cause an increase in peak flows unless engineering measures are used to prevent this. At most, however, the increases would be moderate and no deleterious flooding effects should result. The modest runoff increases may be more serious in terms of erosion; particularly in the steep, rocky southern section of the site. Conscientious erosion and sediment control plans and strict adherence to them are highly recommended for this fragile area.*

- *Bedrock appears to be the only suitable aquifer for on-site water supply wells in the area. It is difficult to predict the potential yield from any new well, but a survey of wells tapping a rock type similar to that underlying the proposed subdivision site found that about 33 percent of the wells yielded less than 3 gallons per minute (in general, a yield of 3 gpm or more is considered adequate for most household needs). Approximately 92 percent of those wells yielded 1 gpm or more. The natural quality of the well water should be good but sound planning and judgment is required to avoid groundwater contamination by septic system effluent in some parts of the site where bedrock is near the surface (e.g. the southwestern section of the site).*

- *With phase one development (lots 1-19), the difficulties involved with on-site sewage disposal are complex. It is probable that leaching systems can be satisfactorily located and constructed in this area, but it is essential that all site limitations (shallow soils, slope, seasonally high water table) be recognized and properly addressed in the selection of leaching areas and design of subsurface sewage disposal systems. With respect to the remaining proposed 39 lots, it is likely that on-site sewage disposal would be feasible for most lots providing the primary limitation of seasonally high groundwater is adequately controlled.*

- *A field study of the tract together with an archival search revealed no cultural resources which would be adversely impacted by the proposed development. Should the project be approved, it is probable that no archaeological information would be lost.*

- *The subdivision plan appears to conform to town zoning and is generally consistent with regional and state plans. Traffic generated by the development can be expected to approximate 615 one-way trips to and from the site daily. According to demographic multipliers, the total school age population generated by the development will be 66 children if all units contain 3 bedrooms and 120 children if all units contain 4 bedrooms.*

III. SETTING, TOPOGRAPHY, LAND USE

SETTING

The subject site is situated in the west central section of Newtown about two miles from the center of town. The property is irregularly shaped but generally occupies an area bounded by Head of Meadow Road on the east, Scudder Road on the south, Partridge Lane on the west and Great Hill Road on the north (see Figure 2).

TOPOGRAPHY

The topography of the eastern half of the site is characterized by a smoothly rounded, oval hill resembling the bowl of an inverted teaspoon (this landform is known as a drumlin). The southwestern portion of the site bordering this drumlin exhibits austere, shallow to bedrock conditions with an irregular pattern of outcrops, slopes and drainageways. The northwest extremity of the site is nearly level and consists primarily of wetland.

The boundary separating Deep Brook and Pond Brook watersheds divides the property nearly equally. Drainage from the site contributes to three perennial streams. Two flow to Deep Brook and eventually into the Pootatuck, the third flows directly into Lake Lillinonah.

LAND USE

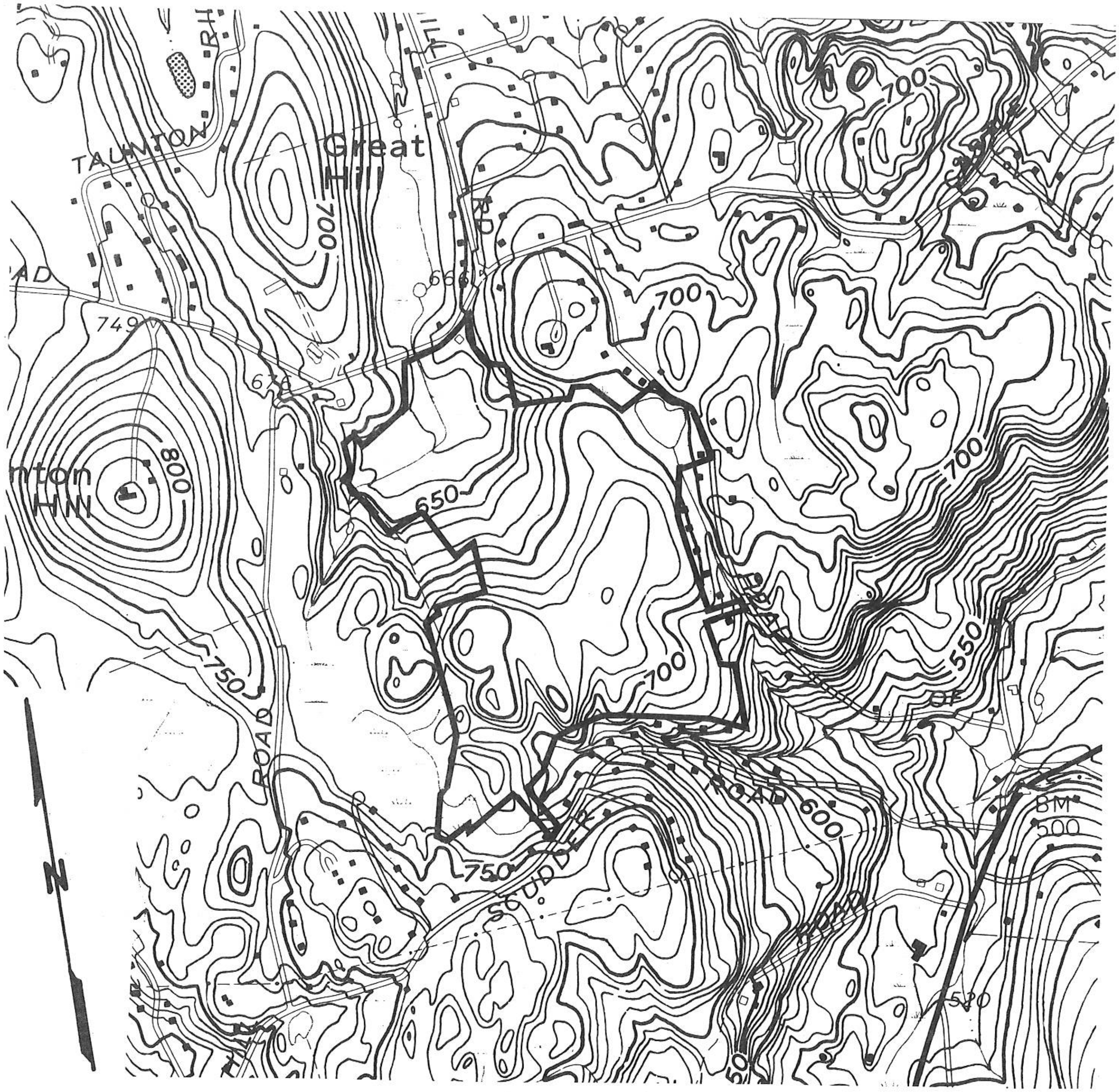
A review of land use records of the property reveals that it has been devoted to agricultural pursuits for generations. Approximately forty acres was devoted to crop production with an equal amount for pasture. Although this and several, large neighboring properties remain undeveloped they are surrounded by residential subdivisions. Once one of the best agricultural areas in Newtown, only three farms remain in the Taunton neighborhood.

IV. GEOLOGY

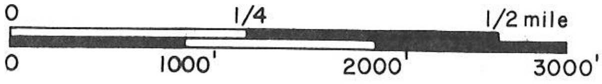
Although the topography of the Colonial Hills site is varied, the geologic components are relatively simple: a knobby bedrock surface is covered with a blanket of glacial sediments of irregular thickness. The bedrock is described in detail in "The Bedrock Geology of the Newtown Quadrangle", Quadrangle Report No. 33 of the Connecticut Geological and Natural History Survey, by R. F. Stanley and K. G. Caldwell. Most of the exposed bedrock is schist, a layered unit in which platy or flaky minerals, such as mica, have aligned to form parting surfaces. The major mineral constituents of the schist are plagioclase, biotite, muscovite, and quartz. In some areas, a foliated granite crops out. This rock type is more durable than the schist, containing higher percentages of quartz, and it is generally not as susceptible to being parted into flaggy boulders.

The glacial sediments on the bedrock are classified as till. Till consists of a nonsorted mixture of rock particles of varied shapes and sizes. The particles were incorporated into an ice sheet as it passed across the land, and were

FIGURE 2.
TOPOGRAPHIC MAP



SCALE 1" = 1000'



later redeposited directly from the ice. The topmost part of the till is often sandy and relatively loose, but lower layers are typically siltier and very compact. Soils data suggests that the most compact till is commonly near the surface in the southern and eastern sections of the site, while the sandier variety is more common in the moderately sloping northwest section. The till appears to be generally thicker than 10 feet in the northern half of the site, but it is commonly thinner or absent in the southern half. The bedrock outcrop map which accompanies this report (Figure 3) gives a general indication of where the till is thinnest.

V. 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 limitation as determined by the U.S.D.A. Soil Conservation Service. The Appendix of this report also contains detailed "Soil Descriptions" of all soils identified on the property.

SOIL CHARACTERISTICS

Basically there are nineteen soil types on the property which may be categorized into five natural soil groups:

1. terrace soils over sand and gravel
2. upland soils over friable to firm glacial till
3. upland soils over compact glacial till
4. upland soils rocky and shallow to bedrock
5. marsh and swamp soils

Predominantly, the soils on the site fall within group three (upland soils over compact glacial till); followed in order by soils in groups two, four, five, and one.

In terms of proposed lots, twelve consist primarily of group two soils, twenty-nine of group three soils, fourteen of group four soils and three of group five soils (see Figure 4).

The lots associated with each soil type (i.e. consisting primarily of that particular soil) is presented below together with a brief discussion of major soil characteristics.

Group Two Soils: Upland Soils Over Friable to Firm Glacial Till

- Well drained - 3-15% slopes (Charlton fine sandy loam)

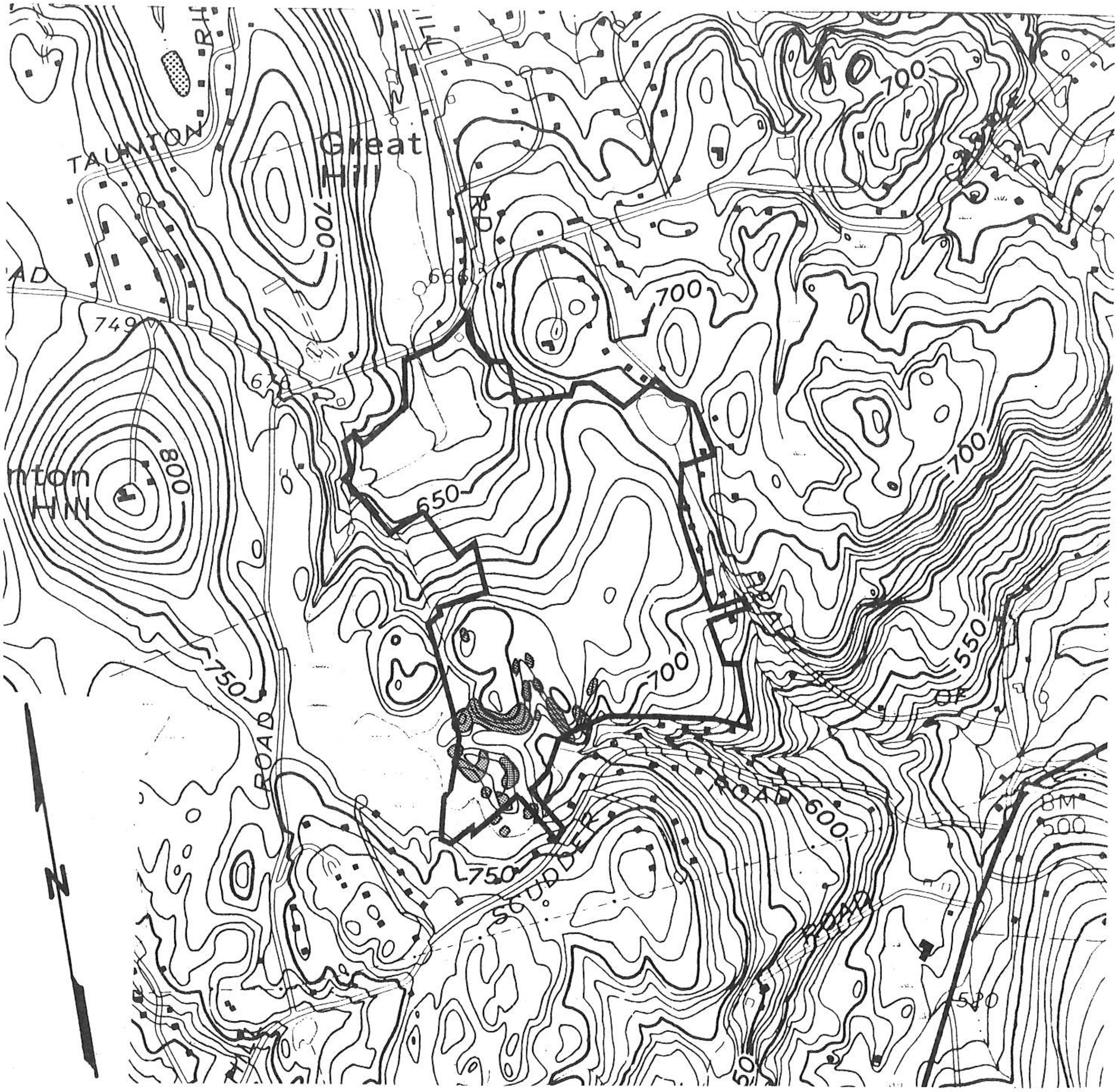
  Lots #9 - 10 - 21 - 22 - 23 - 24 - 39 - 40 - 41 - 50 - 54.

  These soils have moderate to rapid permeability and deep water tables. The installation and operation of on-site subsurface septic disposal systems pose no significant problems and do not normally require special design considerations. Soil conditions are also favorable for the construction of homes, streets and driveways.

FIGURE 3.

BEDROCK OUTCROP MAP

BASED ON FIELD OBSERVATIONS ONLY



SCALE 1" = 1000'

MAPPING BY M. ZIZKA, 1979

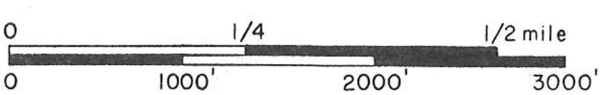
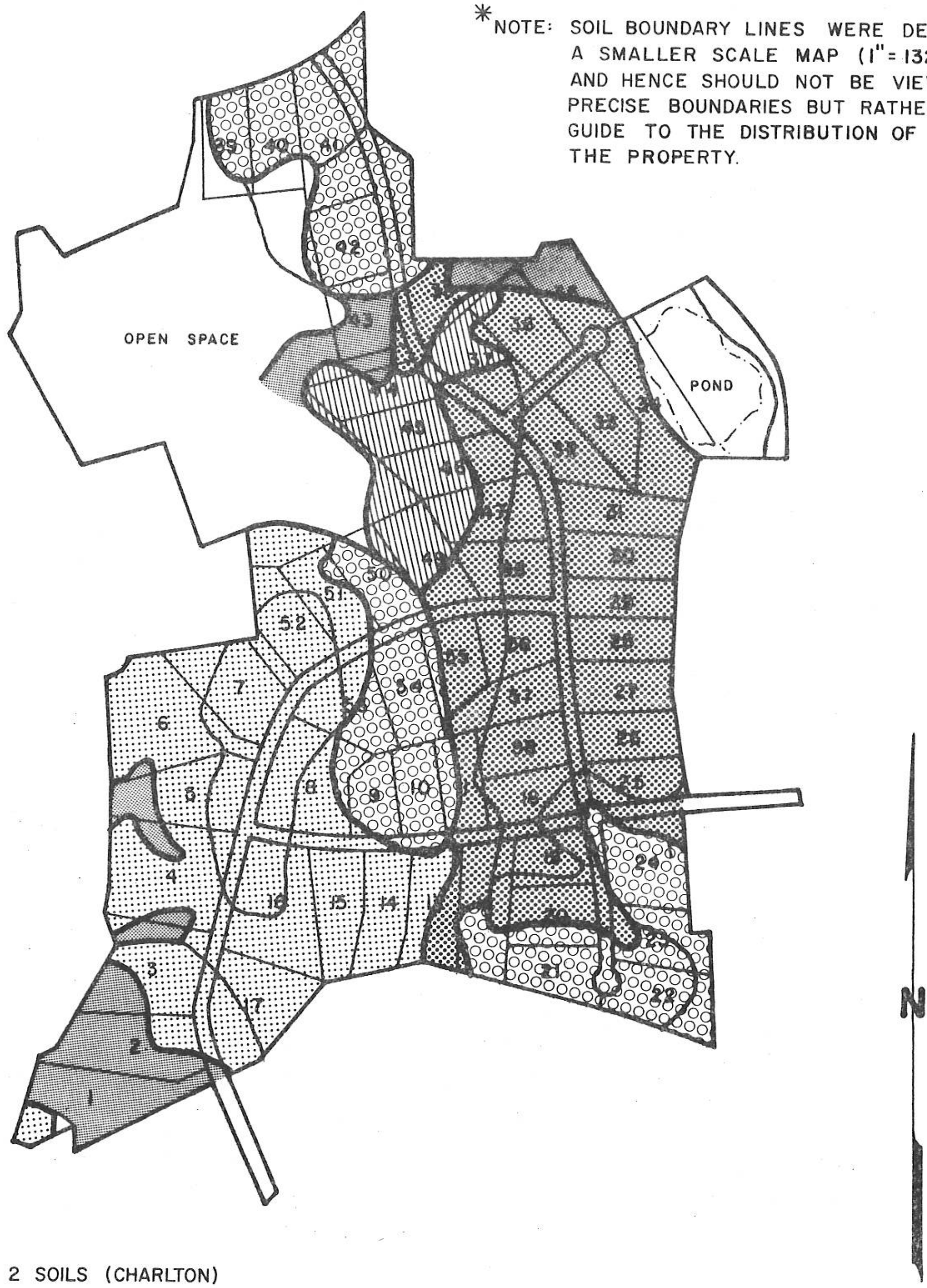


FIGURE 4.

NATURAL SOIL GROUPS AND PROPOSED LOTS*

*NOTE: SOIL BOUNDARY LINES WERE DERIVED FROM A SMALLER SCALE MAP (1" = 1320' SCALE) AND HENCE SHOULD NOT BE VIEWED AS PRECISE BOUNDARIES BUT RATHER AS A GUIDE TO THE DISTRIBUTION OF SOILS ON THE PROPERTY.



KEY

- GROUP 2 SOILS (CHARLTON)
- GROUP 3 SOILS (PAXTON)
- GROUP 3 SOILS (WOODBRIDGE)
- GROUP 4 SOILS (HOLLIS)
- GROUP 5 SOILS (POORLY DRAINED) (NOTE: MORE DETAILED INLAND WETLANDS MAPPING HAS BEEN PERFORMED BY THE APPLICANT)

SCALE: 1" = 500'

0 — 1/4 mile

0 — 500' — 1000' — 1500'

- Well Drained - 15-25% slopes (Charlton fine sandy loam)

  Lot #42

  These are the same Charlton soils, but due to the steepness of the slopes, special consideration in home site selection and septic system design is essential.

Group Three Soils: Upland Soils Over Compact Glacial Till

- Well Drained - 3-15% slopes (Paxton fine sandy loam)

  Lots #11 - 12 - 18 - 19 - 20 - 25 - 26 - 27 - 28 - 29 - 30 - 31
  32 - 33 - 34 - 35 - 36 - 37 - 47 - 48 - 55 - 56 - 57 - 58

  These soils are underlain by compact glacial till (hardpan) at depths varying from sixteen to forty-two inches. Although permeability is moderate above the hardpan, vertical percolation is severely inhibited within the hardpan itself. As a result, a perched water table develops on the surface of the hardpan in normally wet seasons of the year. During these periods, the danger of groundwater entering leaching trenches exists as does the problem of down slope break-outs of septic effluent.

  Most of the percolation in these soils is lateral, or gravitational, down slope, on the surface of the hardpan. Characteristically, seepage will occur at points where surface topography changes, or where the surface of the hardpan occurs nearer to the ground surface.

  Soil conditions are favorable for the excavation of basements of homes on soils with slopes less than 8 percent; slopes above 8 percent are a moderate limitation. Stability of footings is not a problem, but measures such as footing drains are needed to prevent seepage into basements.

  The hazard of frost heaving of roads and driveways (because of water accumulation above the hardpan) requires special consideration. Soil seepage on road cuts may also be a hazard during wet seasons.

- Well Drained - 15-25% slopes (Paxton fine sandy loam)

  Lot #38

  The hazard of down slope breakouts and side hill seepage is increased on these soils due to the steepness of the slopes.

- Moderately Well Drained - 3-15% slopes (Woodbridge fine sandy loam)

  Lots #44 - 45 - 46 - 49

  The limitations associated with these soils are similar to those listed above (Paxton soils), but are further aggravated by the fact that the perched water table rises to within fifteen to twenty inches of the soil surface and persists from late fall through late spring. These soils are commonly found on the lower portions of slopes which receive groundwater from higher elevations by virtue of lateral drainage.

Special considerations both in design and installation of subsurface sewage disposal systems are critical for these soils. The installation of curtain drains in combination with raised systems is the most common technique used to combat these soil limitations.

The seasonal water table of these soils also creates problems in the construction of homes with basements and measures such as drainage are needed to prevent seepage into basements. Here again special consideration must be given to the hazard of frost heaving and the possibility of soil slippage on road cuts during wet seasons.

Group Four Soils: Upland Soils Rocky and Shallow to Bedrock

- 3 - 15% slopes (Hollis rocky fine sandy loam)

  Lots #3 - 4 - 5 - 6 - 7 - 8 -13 - 14 - 15 - 16 - 17 - 51 - 52 - 53

  These soils are generally less than twenty inches in depth over bedrock; with ledge outcrops occupying up to fifty percent of the land surface. It is important to note, however, that in all soil complexes (e.g. Hollis-Charlton) there are inclusions of other soils. Reports of successful deep test pits should not be discounted.

  The shallowness of the soil coupled with the fracture characteristics of the bedrock can present insurmountable restraints in the utilization of these soils for on-site sewage disposal. The potential for groundwater and well pollution is always present.

  Septic system sites should be thoroughly investigated to assure adequate soil depth; and the lateral and topographic separation of septic systems and on-site wells should be maximized.

Group Five Soils: Marsh and Swamp Soils

- Poorly and Very Poorly Drained Soils.

  Lots #1 - 2 - 43

  These are permanently wet soils that are unsuited for residential development. (It should be noted that more detailed inland wetlands mapping by the applicant indicates lot #2 is not predominantly wetland.)

SOIL LOSS AND SEDIMENTATION

The soils at this site can be easily eroded if not properly protected during construction. With implementation of the proposed project, it is recommended that an erosion and sediment control plan for the entire development process be prepared and followed. Erosion and sediment control practices are described in the "Erosion and Sediment Control Handbook--Connecticut" (U.S.D.A. Soil Conservation Service, 1976). Additional assistance in the preparation and review of erosion and sediment control plans is available from the Fairfield County Conservation District.

It is difficult at this time to make specific recommendations for erosion and sediment control due to the preliminary nature of the subdivision proposal. Some basic principles which should be followed however include:

- Complete each section of the proposed road (with all erosion and sediment control practices in place) before the lots along that section are developed.
- Keep soil disturbance during construction to a minimum.
- Note, respect, and use natural drainage where possible.
- Regrade and vegetate exposed areas as soon as possible.
- Protect stockpiled soil with mulch and/or vegetation.
- Attempt to keep cuts and fills at a 3:1 slope.
- Use erosion and sediment controls such as haybale check dams wherever feasible.
- Consider utilizing sediment traps and energy dissipators where appropriate in the storm water management system.

FORESTRY

Seven distinct vegetation types are present on this ± 100 acre tract. Stand descriptions and recommendations for management are presented below (refer to Figure 5).

STAND DESCRIPTIONS

STAND A. MIXED HARDWOODS - Pole to sawlog-size black oak, red oak, white oak tulip tree, black birch and red maple make up this fully-stocked 29 acre stand. The understory species present are American hornbeam, witchhazel, shadbush, azalea, sassafras and hardwood tree seedlings. Ground cover is made up primarily of club mosses, huckleberry and Christmas ferns.

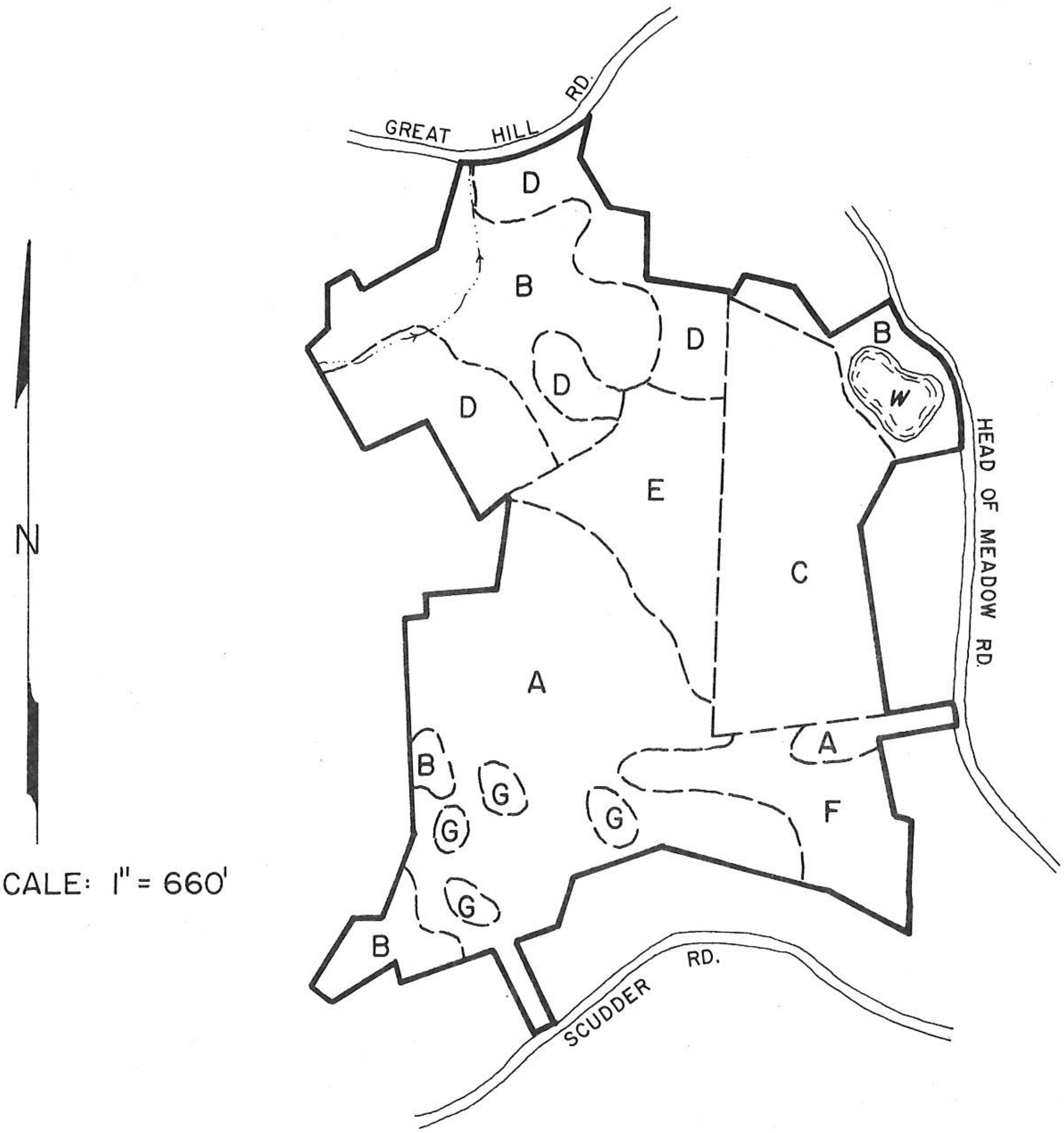
STAND B. HARDWOOD SWAMP - Seedling to pole-size red maple in clumps on hummocks, with occasional white ash and sugar maple, are present in this 20 acre under-stocked stand. Spicebush, sweetpepper bush, highbush blueberry and speckled alder form a dense understory in some areas. Ferns and mosses are growing on the hummocks. Clumps of marsh grasses are present in areas now supporting predominantly seedling size red maple.

STAND C. OPEN FIELD - The main components of this 19 acre field are grasses, goldenrod and milkweed. Scattered multiflora rose and seedling-size red cedar, red maple, white ash and apple trees are also present but in low numbers.

STAND D. MIXED HARDWOODS - This 14 acre under-stocked stand was recently abandoned as pasture land or orchards. Sapling-size red cedar, black birch, red maple, sugar maple and white ash are present with a few pole-size

FIGURE 5.

VEGETATION TYPE MAP



SCALE: 1" = 660'

LEGEND

ROAD

PROPERTY BOUNDARY

STAND BOUNDARY

STREAM

VEGETATION STAND TYPES*

STAND A - MIXED-HARDWOODS, POLE to SAWLOG SIZE, FULLY STOCKED

STAND B - HARDWOOD SWAMP, SEEDLING to POLE SIZE, UNDER to FULLY STOCKED

STAND C - OPEN FIELD

STAND D - MIXED-HARDWOODS, SAPLING SIZE, UNDERSTOCKED

STAND E - MIXED-HARDWOODS, SAPLING TO POLE SIZE, OVERSTOCKED

STAND F - OLD FIELD, POLE SIZE, FULLY STOCKED

STAND G - OAK RIDGE, POLE SIZE, UNDERSTOCKED

* SEEDLING SIZE - UP TO 1" IN DIAMETER AT BREAST HEIGHT (D.B.H.)
SAPLING SIZE - 1" to 5" IN D.B.H.
POLE SIZE - 5" to 11" IN D.B.H.
SAWLOG SIZE - 11" and GREATER IN D.B.H.

apple trees. Multiflora rose, staghorn sumac, bayberry, milkweed, goldenrod and grasses dominate the area.

STAND E. MIXED HARDWOODS - This 9 acre over-stocked stand is made up of sapling to pole-size red maple, sugar maple and white ash. The understory of gray birch, red cedar and apple trees is declining in health. Club mosses and ferns are present.

STAND F. OLD FIELD - Pole-size red cedar, gray birch and black birch are present in this fully-stocked 7 acre stand. Ground cover consists of grasses and club mosses.

STAND G. OAK RIDGE - Poor quality pole-size chestnut oak and scarlet oak are present in this 3 acre under-stocked stand. Black birch and American beech seedlings are the dominant understory species present. Huckleberry and Christmas fern form the ground cover in this area.

LIMITING CONDITIONS BY STAND

The soils associated with the hardwood swamp (Stand B) are characterized by a permanent high water table. These saturated and poorly aerated soils limit the depth of tree and shrub root systems. Growth rates of the trees present are slow and tree quality is generally poor. Management of these areas for timber production is usually not economically feasible because of the severe limitation the high water table imposes on equipment use.

The soils located on the rocky ridge tops (Stand G) are shallow and excessively drained. Lack of adequate moisture throughout most of the year is the primary reason for the stunted growth and malformed appearance of the trees growing in this stand.

POTENTIAL HAZARDS AND MITIGATING PRACTICES

Dead and dying trees in danger of falling become hazardous when they are near roadways, utility lines, buildings or recreation areas and should be removed.

Construction of roadways, buildings, and septic systems in Stand A will undoubtedly require intensive alteration of the soil. It should be recognized that trees are very sensitive to the conditon of the soil under their crowns. Changes in soil aeration, moisture level or physical constitution under a trees canopy may cause the death of that tree within 3 to 5 years. Hence, soil disturbances under trees that are to be saved should be limited whenever possible and careless injuries to trees should be avoided. Saving trees in groups or "islands" will help to reduce the possibility of tree mortality due to excessive soil disturbance or tree injury.

In general, trees which are healthy and full crowned are usually more tolerant of developmental disturbances and should be preserved over less healthy poorer quality trees.

The hardwood swamp and wetland areas making up Stand B contain very fragile plant communities. Permanent changes in the water table may kill the trees, shrubs and herbaceous vegetation growing in these areas. Hence, efforts should be made to alter the wetland ground water levels as little as possible.

Another concern in the Stand B areas is that the saturated soils and shallow root systems cause the larger, more crowded trees to be highly susceptible to windthrow. Openings and channels which allow wind to flow through rather than over the trees in this stand should be avoided.

MANAGEMENT TECHNIQUES

Thinnings in both stands A and E would stimulate the growth rates of residual trees by reducing crowding. Thinnings would also improve aesthetics and stand quality by removing unattractive, unhealthy and poor quality trees. Removal of about one-third of the volume in these stands would be beneficial and should be considered by the developer. Although there may not be enough volume in unhealthy, poor quality, sawlog-size trees to interest a commercial harvester, commercial removal of fuelwood may prove a feasible alternative. Such fuelwood thinnings should leave untouched the more aesthetic, healthier, higher quality trees.

Planting a hedgerow on the eastern portion of the open field (Stand C) with a combination of white pine, hemlock and larch, eight to ten feet apart would improve the aesthetics, wildlife habitat and variety of the area. This planting would also eventually act as a windbreak and provide a visual barrier between existing and proposed houses.

VII. HYDROLOGY

The site is almost completely surrounded by brooks. Development will increase the runoff to the brooks for a given amount of precipitation. This additional runoff, in turn, will cause an increase in peak flows unless engineering measures are used to prevent this. At most, however, the increases would be moderate and no deleterious flooding effects should result.

Three hydrologic design points are shown in Figure 6, as are their associated watersheds. Table 1 shows estimated present and anticipated future peak flows at those points for the theoretical 25-year, 24-hour storm and the 50-year, 24-hour storm.* (Although no individual design point along the brook near Head of Meadow Road was studied, it is clear that the peak flow increases in that brook would be similar to those experienced by the brook along Scudder Road.)

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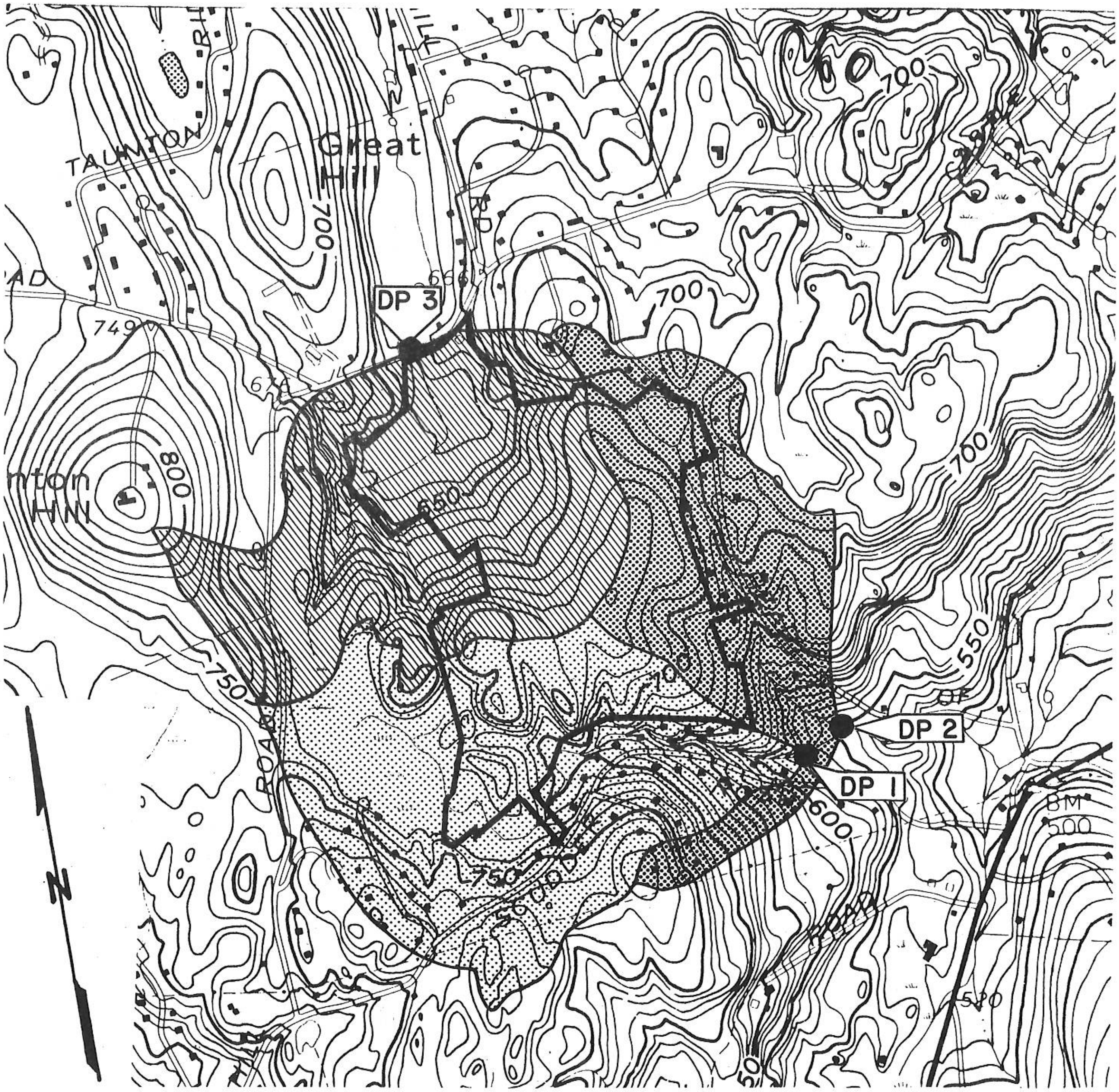
* 25- year, 24-hour storm = a storm of 24 hour duration that occurs on a statistical average of once every 25 years.

50-year, 24-hour storm = a storm of 24 hour duration that occurs on a statistical average of once every 50 years.

FIGURE 6.
HYDROLOGIC DESIGN POINTS & THEIR ASSOCIATED WATERSHED AREAS*



SCALE 1" = 1000'

0 1/4 1/2 mile
0 1000' 2000' 3000'

*DESIGN POINT 2 ENCOMPASSES BOTH STIPPLED AREAS

TABLE 1 Estimated present and anticipated future peak flows for the three design points shown in Figure 6.

	25-year, 24-hour storm	Design Point (Refer to Fig.6)	50-year, 24-hour storm
Present Flows	246 cubic feet/second	1	367 cubic feet/second
	349 cfs	2	525 cfs
	151 cfs	3	238 cfs
Future Flows	276 cfs (12% increase)	1	408 cfs (11% increase)
	395 cfs (13% increase)	2	583 cfs (11% increase)
	178 cfs (18% increase)	3	275 cfs (16% increase)

The method used to calculate the peak flows was based on procedures outlined in Technical Release No. 55 of the Soil Conservation Service. Rainfall data from the U.S. Geological Survey Water Resources Division was also used. As indicated in Table 1, the peak flow increases would be generally less than 20 percent. While these increases should not generate significant additional flooding, as mentioned above, it may be useful to examine the sizes of any culverts along the brooks' courses to assure that these culverts are adequately sized to accommodate the increases. Most of the culverts along Scudder Road appear to have ample additional capacity.

The modest runoff increases may be more serious in terms of erosion; particularly in the steep, rocky southern section of the site. Conscientious erosion and sediment control plans and strict adherence to them are highly recommended for this fragile area.

VIII. WATER SUPPLY

Individual on-site wells are planned for the subdivision. It is unlikely that the till overburden would provide a suitable aquifer because of its relative thinness. According to Connecticut Water Resources Bulletin No. 19 (hereafter called CWRB 19), the optimum condition for a dug well in till would be to have several tens of feet of saturated section.

Bedrock is more likely to provide adequate, sustainable yields. However, because of the way in which most groundwater is transmitted through bedrock (through an irregular fracture system), it is difficult to predict the yield of any new well. The U. S. Geological Survey performed a statistical study of 294 bedrock-based wells in the lower Housatonic River basin, recording some of the results in CWRB 19. According to that study, about 33 percent of the wells that tapped schist yielded less than 3 gallons per minute (in general a yield of 3 gpm or more is considered adequate for most household needs). Approximately 92 percent of those wells yielded 1 gmp or more. It should be noted that for the most part, well yields were not substantially increased by deepening the wells beyond the upper 100 feet of bedrock. Of 49 bedrock wells which were surveyed for CWRB 19 and which yielded less than 3 gpm from the upper 100 feet of bedrock, only half yielded 3 gpm or more after deepening; about 20 percent yielded 5 gpm or more; and none yielded 10 gpm or more. Of course, the increased storage in a deeper bedrock well may help to offset a marginal yield, but such offsets could not be sustained for long periods.

The natural quality of the well water should be good. The lack of noticeable rust-staining on the local bedrock suggests a relatively low concentration of iron (iron is often a problem in schist-based wells in Connecticut). The natural hardness is also likely to be low. Septic system effluent may be a problem however in some parts of the property where bedrock is near the surface. Although test hole data supplied by the developer showed reasonably deep pockets of till in the southwestern section of the site, on-site inspection suggested that these pockets were quite limited in area and that they may not be able to provide adequate purification of the effluent before it enters the bedrock fracture system. Sound planning and judgment is required in these lots to avoid deleterious effects on the groundwater. At any rate, the orientation of the fractures in the bedrock indicate that wells should be placed, if possible, to the southeast of the septic systems on individual lots in the southwest section. Efforts should also be made to maximize the separation distance between wells and septic systems in this area.

IX. SEWAGE DISPOSAL

Ten of the proposed 19 "phase one" lots lie within the 2-acre lot residential zone. The remaining lots are 1-acre minimum. With phase one development, the difficulties involved with on-site sewage disposal are complex and therefore require a great deal of thought and consideration prior to any construction. Typically in areas such as this which are shallow to bedrock, moderately sloped and subject to groundwater fluctuation (observed on several lots during the site inspection), leaching systems can be satisfactorily located and constructed. It is however, essential that all site limitations be recognized and properly addressed in the selection of leaching areas and design of subsurface sewage disposal systems.

Specific conditions noted in the review of plans and site inspection are:

1. Although Lot #1 is physically large in area, very little space is available for house, driveway, well and leaching system location due to the permanently wet nature of most of the site. There is no room for error on this proposed lot and therefore, it is recommended that the applicant demonstrate how the essential systems will fit within the specific areas.

2. Along the center section of road frontage on Lot #2, a fairly significant road cut (6-8') is proposed relatively close to the leaching area. The feasibility of relocating the leaching system westerly and to the rear of the proposed dwelling should be investigated. This alternative would, of course, require additional soil testing.

3. The proposed leaching system on Lot #3 lies adjacent to a wet area (water on surface of ground observed during ERT field review). Relocation of the septic system (and house if necessary) is suggested.

4. The entire leaching area of Lot #5 is laid out in a wet area (surface water observed frozen at grade during site investigation). Relocation of the leaching area is necessary.

5. Soil test data provided by the developer indicates that lots #8, 9, 10, 11, 12 and 13 will most likely have a seasonally high groundwater table which must be properly dealt with. Groundwater intercepting drains appear feasible for existing conditions provided storm drains in the road are accessible at the proper depths.

6. No soil tests were conducted within the proposed leaching areas on Lots #13 and 14. With ledge rock only 3 feet below grade on Lot #15, it is essential that soil data within each leaching area be provided.

7. Due to ledge rock observed at relatively shallow depths on Lots #15 and 17, these two lots would be considered unsuitable for sewage disposal by the State Department of Health and therefore, either additional soil tests must be performed to identify more satisfactorily leaching areas or the lots may be combined with adjacent proposed lots.

With respect to the remaining proposed 39 lots, it is most likely that, with the exception of Lot #42, on-site sewage disposal would be feasible providing the primary limitation of seasonally high groundwater (perched water) is adequately controlled. This is particularly important for the open field lots which fortunately have sufficient slope necessary for successful drain operation. Road storm drain lines within the subdivision should be extended where necessary to provide drains with discharge points rather than flowing over ground and onto town roads. Several additional seepage tests extending totally in the observed hardpan soils should be performed as well as monitoring of groundwater levels during the wet spring months to determine the characteristics of underlying hardpan soils and groundwater elevations. Lot #42 is unsuitable for on-site sewage disposal due to shallow ledge rock and ledge conditions observed down grade from the leaching area.

Based upon soil test data provided by the applicant and conditions observed in the field, it is likely that for most of the 58 lots, specifically prepared engineering plans would be required to clearly illustrate how various site limitations will be handled. Additional soil testing will be required for each lot within the proposed leaching areas, particularly for those lots on which ledge rock was observed. Once the limitations have been identified and properly addressed in plans or by required site improvements, subsurface sewage disposal systems should function adequately without adversely affecting health or the environment.

Except for the specific items noted on several lots within the proposed 58-lot subdivision, the developer's proposal appears reasonable for soil conditions on the 100-acre parcel and construction of subsurface sewage disposal systems does appear feasible.

X. CULTURAL RESOURCES

A field study of the 100 acre tract did not locate any cultural resources which would be adversely impacted by the proposed residential subdivision.

An archival search, using an 1867 Beers' Atlas (New York and Vicinity), revealed that there were no structures on the land in the 19th century. A brief surface examination confirmed this information. There is also no evidence of prehistoric sites on the tract. Files at the American Indian Archaeological Institute contain no such data; and the Luf family, who previously farmed much of the tract, knew of no sites within the area.

In view of this information it is suspected that there is a low potential for archaeological deposits within the tract. Should the project be approved, it is probable that no archaeological information would be lost.

XI. PLANNING CONSIDERATIONS

CONSISTENCY OF PROPOSED PROJECT WITH STATE AND REGIONAL PLANS

The southwestern quadrant of the site is zoned for 2 acre lot minimums while the remainder is zoned for 1 acre lot minimums, and the subdivision plan conforms to this pattern. The land use plan for the Housatonic Valley Region recommends the same densities as found in local zoning. Connecticut's proposed Conservation & Development Policies Plan recommends that urban residential densities be avoided on this site. The Tri-State Regional Planning Commission's Regional Development Guide recommends that the northern and eastern sections of the site be developed with urban services and residential lots of one-half acre or smaller, while the remainder of the site should be developed without urban services with minimum residential lots of at least 2 acres.

Considering the location of this property in relation to existing and proposed utility service areas and its remoteness from central areas, low density residential zoning is considered the best use of the property by the ERT planner.

TRAFFIC AND CIRCULATION

Access from the proposed subdivision will be to Head of Meadow Road, Great Hill Road, and Scudder Road. While Head of Meadow Road is at present a dead end road, it is proposed in the town's circulation plan for eventual upgrading to a Minor Collector Road. That portion of Great Hill Road which the subdivision's road system will connect with is classified by the town's circulation plan as an existing Minor Collector Road. Scudder Road is classified as a local residential street.

According to a 1974 Connecticut Department of Transportation study of trip generation rates, an average of 10.6 auto trips per unit are generated for this type of development. Given the 58 building lots shown on the property and the assumption that all trips will be made by auto as public transit is unavailable, then 615 one-way trips will be made to and from the subdivision daily. Given the location of the subdivision in relation to I-84, Route 302 and Newtown center it is reasonable to assume that this total volume of traffic will be roughly divided between the exits from the subdivision on to Great Hill Road and Scudder Road.

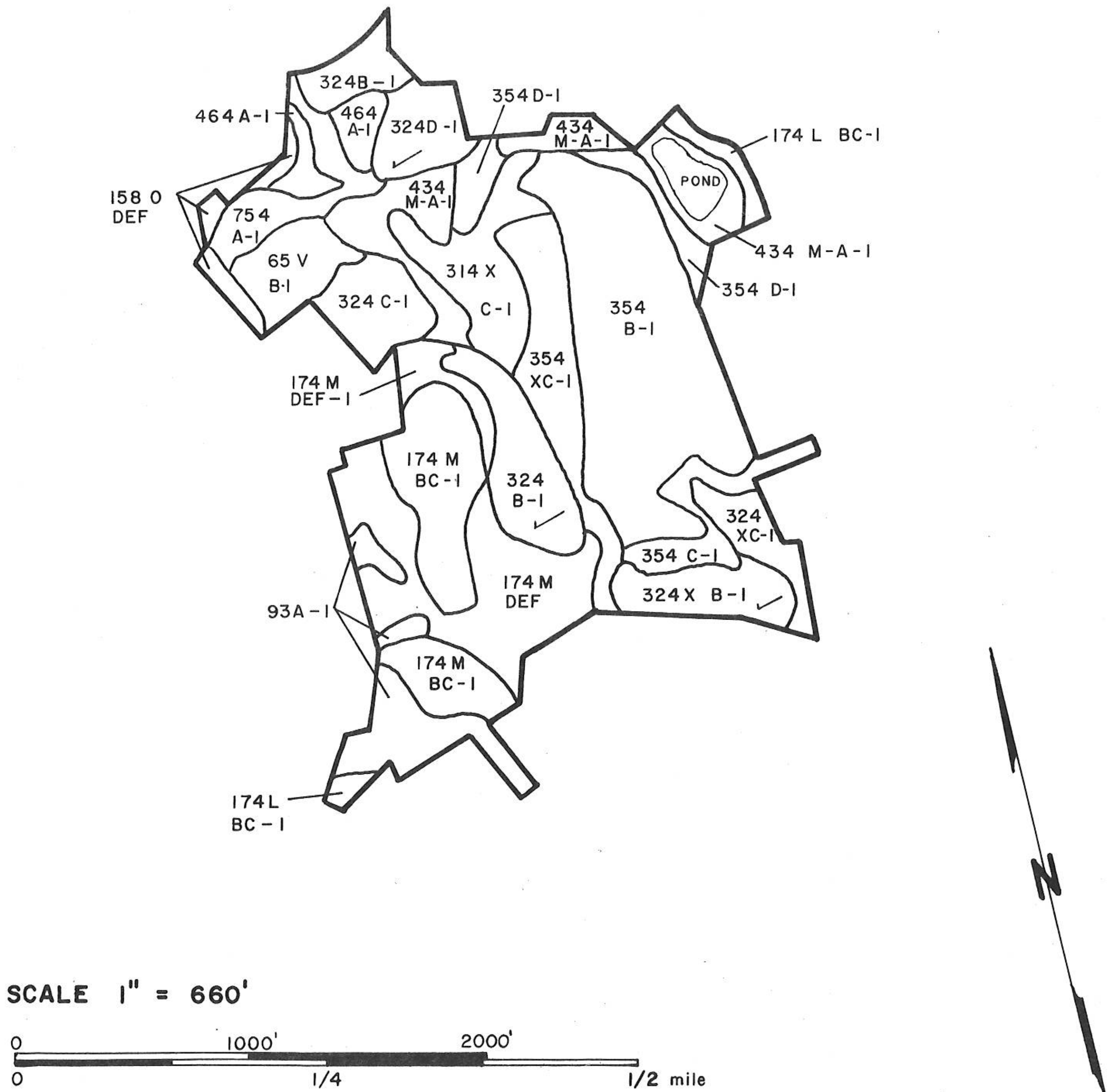
IMPACT ON SCHOOLS

According to demographic multipliers three bedroom homes contain on the average 1.130 school age children and four bedroom homes contain 2.068 school age children. Given the eventual construction of 58 single-family homes the total school-age population generated by the development will be 66 children if all units contain 3 bedrooms and 120 children if all units contain 4 bedrooms.

* * * * *

APPENDIX

SOILS MAP


324B-1
464 A-1
464
A-1
324D-1
354 D-1
434
M-A-1
174 L BC-1
POND
158 O
DEF
754
A-1
434
M-A-1
65 V
B-1
314 X
C-1
324 C-1
434 M-A-1
354 D-1
354
B-1
354
XC-1
174 M
DEF-1
174 M
BC-1
324
B-1
324
XC-1
354 C-1
324 X B-1
174 M
DEF
93A-1
174 M
BC-1
174L
BC-1
N
SCALE 1" = 660'
0
1000'
2000'
0
1/4
1/2 mile

SOILS LIMITATION CHART

COLONIAL HILL ESTATES - NEWTOWN, CONNECTICUT

Map Symbol	Soil Name	Limitation Rating For:* Septic Tank Filter Field	Homesite With Basement	Homesite Landscaping	Streets & Parking Lots	Reason for Limitation
174M-BC-1	Hollis extremely rocky fine sandy loam, 3-15% slopes	3	3	3	3	Shallowness, rockiness
174L-BC-1	Hollis Charlton complex, 3-15% slopes	3	3	3	3	Shallowness
174M-DEF-1	Hollis extremely rocky fine sandy loam, 15-35% slopes	3	3	3	3	Shallowness, rockiness
324-B-1	Charlton fine sandy loam, 3-8% slopes	1	1	1	2	Slope
324X-B-1	Charlton stony fine sandy loam, 3-8% slopes	2	2	2	2	Stoniness
324-C-1	Charlton fine sandy loam, 8-15% slopes	2	2	2	2	Slope
324X-C-1	Charlton stony fine sandy loam, 8-15% slopes	2	2	2	2	Slope, stoniness
324D-1	Charlton fine sandy loam, 15-25% slopes	3	3	3	3	Slope
314X-C-1	Woodbridge stony fine sandy loam, 8-15% slopes	3	2	2	2	Fragipan - seasonal high water
354B-1	Paxton fine sandy loam, 3-8% slopes	3	1	1	2	Fragipan - seasonal high water
354C-1	Paxton fine sandy loam, 8-15% slopes	3	2	2	3	Fragipan - slope
354XC-1	Paxton stony fine sandy loam, 8-15% slopes	3	2	2	3	Fragipan, slope, stoniness
354D-1	Paxton fine sandy loam, 15-25% slopes	3	3	3	3	Fragipan, slope, stoniness

SOILS LIMITATION CHART (CONT'D.)

Map Symbol	Soil Name	Limitation Rating For*: Septic Tank Filter Field	Homesite With Basement	Homesite Landscaping	Streets & Parking Lots	Reason for Limitation
434M-A-1	Leicester, Ridgebury, & Whitman very stony soils, 0-5% slopes	3	3	3	3	Very high water table, stoniness
464A-1	Raynham silt loam, shallow variant	3	3	3	3	Very high water table, stoniness
65VB-1	Enfield silt loam, 3-8% slopes	1	1	1	2	Slope
754A-1	Scarboro fine sandy loam	3	3	3	3	Very high water table
93A-1	Peat and Mucks	3	3	3	3	Very high water table
1580DEF-1	Terrace Escarpments 15-35% slopes	3	3	3	3	Slope
✓	Bedrock outcrops					Bedrock out cropping

*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.

SOIL DESCRIPTIONS

174L-BC Hollis Charlton rocky complex, 3 to 15 percent slopes. This mapping unit is composed of gently sloping and sloping soils. It consists of about 30 percent Hollis fine sandy loam, 30 percent of an unnamed soil that is 20 to 40 inches deep over bedrock and about 20 percent of Charlton fine sandy loam. The remainder of this unit consists of inclusions of Paxton, Sutton and other soils. The soils in this unit occur in such an intricate and complex pattern that it is not practical to separate them on the scale of map used. In many places there are narrow drainageways with poorly drained soils that are too narrow to separate on the map. Bedrock outcrops are few to numerous and stoniness ranges from almost none to extremely stony.

The Hollis soil is somewhat excessively drained and consists of friable to very friable fine sandy loam less than 20 inches deep to bedrock. The well drained unnamed soil is also a fine sandy loam. The well drained Charlton soil developed in glacial till. Surface soil and subsoil textures to a depth of 20 to 30 inches is fine sandy loam. The underlying material is a sandy loam to fine sandy loam with numerous rock fragments. All of these soils are moderately permeable but drainage is restricted by the underlying bedrock.

17M-BC Hollis extremely rocky fine sandy loam, 3 to 15 percent slopes. This shallow soil is less than 20 inches to the underlying bedrock. It is somewhat excessively drained. Bedrock outcrops are numerous and surface stones and boulders are present in most places. This soil is very friable fine sandy loam and is moderately permeable above the bedrock. The gently sloping and sloping topography is mostly irregular.

17M-DEF Hollis extremely rocky fine sandy loam, 15 to 35 percent slopes.

This moderately steep and steep soil is less than 20 inches deep over bedrock. It is somewhat excessively drained. Bedrock outcrops are numerous and surface stones and boulders are present in most places. This soil is very friable or friable fine sandy loam and is moderately permeable above the bedrock.

323B-1 Charlton fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained, upland soil developed in very friable to firm glacial till. Surface soil and subsoil texture to a depth of 20 to 30 inches is fine sandy loam with some small, angular rock fragments. The underlying material is sandy loam or fine sandy loam with many stones and gravel size rock fragments in places. This soil is moderately permeable throughout, but slowly permeable layers may be present below 36 inches. Charlton soils are members of a drainage sequence that includes the moderately well drained Sutton and the poorly drained Leicester soils. The surface stones have been removed from this soil.

SOIL DESCRIPTIONS

324X-B Charlton stony fine sandy loam, 3 to 8 percent slopes. This gently sloping well drained, upland soil developed in very friable to firm glacial till. It has from 0.1 to 3 percent of the surface covered with stones or boulders. Surface soil and subsoil texture to a depth of 20 to 30 inches is fine sandy loam with some small, angular rock fragments. The underlying material is sandy loam or fine sandy loam with many gravel size rock fragments and stones in places. This soil is moderately permeable, but slowly permeable layers may be present below 36 inches. Charlton soils are members of a drainage sequence that includes the moderately well drained Sutton and poorly drained Leicester soils.

324C Charlton fine sandy loam, 8 to 15 percent slopes. This well drained upland soil developed in very friable to firm glacial till. Surface soil and subsoil texture is fine sandy loam with some small, angular rock fragments to a depth of 20 to 30 inches. The underlying material is sandy loam or fine sandy loam with many stones and gravel size rock fragments in places. This soil is moderately permeable, but slowly permeable layers may be present below 36 inches. Charlton soils are members of a drainage sequence that includes the moderately well drained Sutton and poorly drained Leicester soils. The surface stones have been removed from this soil.

324XC Charlton stony fine sandy loam, 8 to 15 percent slopes. This sloping well drained, upland soil developed in very friable to firm glacial till. It has 0.1 to 3 percent of the surface covered with stones or boulders. Surface soil and subsoil ~~texture to a depth of 20 to 30~~ inches is fine sandy loam with some small, angular rock fragments. The underlying material is sandy loam or fine sandy loam with many gravel size rock fragments and stones in places. These soils are moderately permeable, but slowly permeable layers may be present below 36 inches. Charlton soils are members of a drainage sequence that includes the moderately well drained Sutton and the poorly drained Leicester soils.

324D Charlton fine sandy loam, 15 to 25 percent slopes. This well drained moderately steep to steep upland soil developed in very friable to firm glacial till. Surface soil and subsoil texture to a depth of 20 to 30 inches is fine sandy loam with some small angular rock fragments. The underlying material is sandy loam or fine sandy loam with many stones and gravel size rock fragments in places. This soil is moderately permeable, but slowly permeable layers may be present below 36 inches. Charlton soils are members of a drainage sequence that includes the moderately well drained Sutton and the poorly drained Leicester soils. The surface stones have been removed from this soil.

SOIL DESCRIPTIONS (cont)

354D Paxton fine sandy loam, 15 to 25 percent slopes. This well drained, moderately steep to steep, upland soil has a slowly to very slowly permeable fragipan at about 24 to 30 inches. The surface soil and subsoil texture above the fragipan is friable or friable fine sandy laom. The compact fragipan restrict internal drainage. A perched water table may occur above the fragipan in wet seasons and after heavy rains. Excess water often moves downslope over the fragipan in wet seasons. Paxton soils are members of a drainage sequence that includes the moderately well drained Woodbridge, poorly drained Ridgebury, and very poorly drained Whitman soils. Surface stones and boulders have been removed from this soil.

434M Leicester, Ridgebury and Whitman very stony fine sandy loams. This very stony mapping unit includes poorly and very poorly drained soils. These soils occur in such an intricate and complex pattern that the separation of each individual soil was not possible on the scale of map that was used. These soils have a water table at or near the surface from fall to spring and after heavy rains during the summer.

464A Walpole sandy loam. This is somewhat poorly to poorly drained soil over sand and gravel. It has relatively thin dark colored surface hroizons over mottled subsoil. Surface and subsoil textures range from fine sandy loam to sandy loam. Depth to sand and gravel ranges from about 18 to 30 inches. A seasonal water table is near the surface from late fall through early spring. During dry parts of the year the water table may drop to 6 feet or deeper. Somewhat excessively drained Merrimac and moderately well drained Sudbury are in the drainage sequence with Walpole soils.

65V-B-1 Enfield silt loam, 3 to 8 percent slopes. This well drained, gently sloping soil developed in a silt loam mantle 18 to 30 inches thick over stratified sand and gravel. The moderately permeable surface soil and subsoil layers are friable to very friable silt loam. The rapidly to very rapidly permeable underlying layer of sand and gravel contains numerous cobbles. Enfield soils are associated in drainage sequence with the moderately well drained Tisbury soils.

745A Scarboro loamy fine sand. This is a very poorly drained coarse textured soil. The surface soil is dark-colored and high in organic matter, the subsoil is grayish-colored and sandy. Scarboro soil occupies low lying flat or depressed areas. The ground water table is normally at or near the surface from late fall through late spring but may drop below 3 feet in the summer months. This soil is associated in drainage sequence with excessively drained Windsor soils.

SOIL DESCRIPTIONS

314XC Woodbridge stony fine sandy loam, 8 to 15 percent slopes. This is a moderately well drained soil with a slowly or very slowly permeable fragipan at about 24 inches in depth. It has 0.1 to 3 percent of the surface covered with stones or boulders. Surface soil and subsoil texture above the fragipan is friable or very friable fine sandy loam. The lower part of the subsoil is mottled indicating a waterlogged condition from late fall until spring and after heavy rains in summer. This soil is moderately permeable above the compact and very firm fragipan which restricts internal drainage. Water may move downslope over the fragipan in wet seasons and cause seeps on lower slopes. This soil is a member of the drainage sequence that includes the well drained Paxton, the poorly drained Ridgebury, and the very poorly drained Whitman soils.

354B Paxton fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, well drained, upland soil with a slowly to very slowly permeable fragipan at about 24 to 30 inches in depth. The surface soil and subsoil texture above the fragipan is very friable or friable fine sandy loam. The compact fragipan restricts internal drainage. There may be a perched water table above the fragipan in the winter season and after heavy rains. The excess water may move downslope over the fragipan in wet seasons and cause seeps on lower slopes. Paxton soils are members of a drainage sequence that includes the moderately well drained Woodbridge, poorly drained Ridgebury, and the very poorly drained Whitman soils. Surface stones and boulders have been removed from this soil.

354C Paxton fine sandy loam, 8 to 15 percent slopes. Except for difference in slopes, this unit is similar to Paxton fine sandy loam, 3 to 8 percent slopes.

354XC Paxton stony fine sandy loam, 8 to 15 percent slopes. This sloping well drained, upland soil has a slowly to very slowly permeable fragipan at bout 24 to 30 inches in depth. It has 0.1 to 3 percent of the surface covered with stones, and boulders. The surface soil and subsoil texture above the fragipan is very friable or friable fine sandy loam. The compact fragipan restricts internal drainage. In places, a perched water table may occur above the fragipan in wet seasons and after heavy rains. The water often moves downslope over the fragipan in wet seasons and after heavy rains. Paxton soils are a member of the drainage sequence that includes the moderately well drained Woodbridge, poorly drained Ridgebury, and very poorly drained Whitman soils.

SOIL DESCRIPTIONS (cont)

93-A-1 Muck This unit consists of organic deposits of muck thicker than 40 inches and generally more than 51 inches. These deposits are the remains of reeds and sedges, sphagnum moss, or trees and shrubs which grew in these wet areas. Muck is a decomposed organic material which can no longer be identified as to type of plant from which it was derived. The water table is usually at or near the surface and flooding may occur during the winter or after heavy rains.

158ODEF Hinckley and Windsor soils, 15 to 35 percent slopes. This unit consists of soils that are of sandy or of sandy and gravelly materials on slopes greater than 15 percent. It occurs on steep terrace breaks, kames, and eskers. The slopes are generally short and range from about 100 to several hundred feet in width.

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.