

**KING'S MARK
ENVIRONMENTAL REVIEW TEAM**



**REPORT FOR
BARKER'S CROSSING SUBDIVISION
NORFOLK, CONNECTICUT**

BARKER'S CROSSING SUBDIVISION

NORFOLK, CONNECTICUT

Environmental Review Team Report

Prepared by the King's Mark Environmental Review Team
of the King's Mark Resource Conservation
and Development Area, Inc.

Wallingford, Connecticut

for the

Norfolk Inland Wetlands Commission

and

Planning & Zoning Commission

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 Inland Wetlands Commission, Planning & Zoning Commission and the Town. The results of the Team action are oriented toward the development of a better environmental quality and long-term economics of the land use. The opinions contained herein are those of the individual Team members and do not necessarily represent the views of any regulatory agency with which they may be employed.

JUNE 1988

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team Coordinator, Nancy Ferlow, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this study:

- * William Warzecha, Hydrogeologist
Department of Environmental Protection - Natural Resource Center
- * Kathy Hanford, District Conservationist
USDA - Soil Conservation Service
- * Kip Kolesinskas, Soil Resource Specialist
USDA - Soil Conservation Service
- * Daniel Mayer, Wetland Specialist
Department of Environmental Protection - Water Resources Unit
- * Don Mysling, Fishery Biologist
Department of Environmental Protection - Western District
- * Ralph Scarpino, Forester
Department of Environmental Protection - Regional Office
- * Richard Lynn, Planner
Litchfield Hills Council of Governments
- * Frank D'Addabbo, Traffic Engineer
Department of Transportation

I would also like to thank Susan Anderson, Secretary of the King's Mark Environmental Review Team for assisting in the completion of this report.

Finally, special thanks to John Anderson of the Norfolk Conservation Commission and Norfolk Inland Wetlands Commission, Mary Beth McNamee of the Norfolk Planning & Zoning Commission, Mark Pronovost, developer, and Jerry Saylimbeni, engineer for the developer, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The Norfolk Inland Wetlands Commission and Planning and Zoning Commission have requested that an environmental review be conducted on Barker's Crossing, a 94-acre site proposed for subdivision development. The site is located in the south central section of Norfolk on the Goshen town line. Access is provided from State Route 272. The site contains second growth hardwood forest with some stands of hemlock and is currently being logged. Hall Meadow Brook runs through the northern section of the property, between the site and Route 272. Several wetlands run through the property and along the banks of Hall Meadow Brook. The Brook is a Class A trout stream. Much of the site is steep and very rocky with several seasonal watercourses running through it.

The proposed subdivision would encompass 31 house lots, ranging in size from 2.0 acres to 5.9 acres. Two access roads and two cul-de-sacs are proposed to serve the subdivision. Two crossings of Hall Meadow Brook are proposed. The subdivision would rely upon on-site septic and water.

The Town was primarily concerned with the potential impact that the proposed development would have on: (1) existing wetland corridors; (2) effects of erosion and sedimentation; (3) fisheries habitat; and (4) site design compatibility. Therefore the Town asked the ERT to inventory on-site resources and determine their suitability for the proposed development.

The review process consisted of four phases: (1) inventory of the site's natural resources; (2) assessment of these resources; (3) identification of resource problem areas; and (4) presentation of planning and land use guidelines. Based on the review process, specific resources, areas of concern and development limitations and opportunities were identified. The major findings of the ERT are presented below:

Setting, Land Use and Topography

The property is zoned for two acre lots. Maximum and minimum elevations range from 1,265 to 1,000 feet above sea level, respectively. The major watercourse on the site is Hall Meadow Brook. Several tributaries also occur. The wetlands around these streams have been flagged by a soil scientist. Wetland crossings include two crossings of Hall Meadow Brook for access and driveway crossings for Lots 30 and 31.

Geology

The bedrock that underlies the site has been identified at part of the Berkshire Massif. Two slightly different gneisses form the bedrock. Bedrock was encountered in 8 lots between 2 and 6 feet from the surface. Overlying the bedrock on most of the site is a glacial sediment known as till. The texture of the till ranges from loose and sandy to compact. Till with a compact layer, called a hardpan, generally has a seasonally high water table. Areas comprised of Sutton soils have a seasonally high water table without the hardpan. A small strip of stratified drift forms the Hall Meadow Brook corridor.

Geologic Development Concerns

Geologic limitations on the site include: (1) lots with shallow to bedrock conditions; (2) lots with moderate to steep slopes; (3) till soils with a hardpan layer; and (4) regulated inland wetland soils. These will limit the ability to provide subsurface sewage disposal. Special engineered design plans will be needed to overcome the limitations. Because of the lot size there is some flexibility in septic system placement. It is imperative that detailed soil testing be done on each lot especially in areas of shallow bedrock.

Areas with hardpan soils will require curtain drains to lower the groundwater so it will not interfere with the septic systems functions. Minimum separating distances between septic systems with curtain drains are important. Prior to subdivision development, each lot should be shown to meet the minimum soil standards set out in the public health code. It is suggested that this process be a joint effort between the design engineer and the local health department. Systems should be properly designed and maintained.

The presence of bedrock at shallow depths suggests that blasting will be required for driveways, foundations, roads and utility lines. All blasting should be done carefully and under the strict supervision of experienced personnel. A pre-blast survey might be wise to minimize the chance for damage claims.

Based on the plans, Hall Meadow Brook and its associated wetlands will be crossed twice. Regulated wetlands will also be crossed to access Lots 30 and 31. Wetland crossings are feasible provided they are properly designed. Detailed plans for all crossings should be provided. Approved activities in wetlands should be closely monitored by the Town. Consideration should be given to a shared driveway for Lots 30 and 31.

The two crossings of Hall Meadow Brook need careful consideration. A much larger area of wetland will be disturbed than for the driveway crossing. The impacts will be correspondingly greater. Consideration should be given to eliminating the Brook Hill Road crossing. One alternative for the crossings is the use of bridges.

Wetland soils are regulated under Public Act 155. Any activity in the wetlands requires a permit from the Inland Wetlands Commission. If more than one acre of wetlands is modified, a U.S. Army Corps of Engineers permit may be needed.

Water Supply

The underlying bedrock is the likely source of water for the subdivision. Water from any given well is dependent on the number of fractures in the rock that the well intersects. The availability of water from the bedrock should be sufficient for domestic use. The initial quality of the ground water should be good. The chance for effluent contamination is possible. Proper well construction and separating distances should allow for adequate protection of the bedrock aquifer. There may be a chance of elevated iron and manganese levels which may necessitate appropriate treatment systems.

Hydrology

Drainage from the site flows into Hall Meadow Brook. From the intersection of the proposed culvert in Brook Hill Road, the site represents approximately two percent of the drainage area of the Brook.

Groundwater in the area is classified as GA, which means it is suitable for private drinking water supplies. Sewage disposal will have to be handled carefully to avoid contaminating the groundwater system.

Development of the site will result in increased runoff. The amount of increase will depend upon the extent of the development. Concerns include the potential for flooding, erosion and sedimentation. The site should be examined to see if on-site detention is warranted. If detention basins are needed, they should be located on upland soils if possible. If this is not possible due to site constraints, wetland pockets may need to be used. Because of the moderate and steep slopes, silty soils and excellent aquatic habitat, a thorough erosion and sediment control plan should be followed. The best solution for control is to keep disturbed areas to a minimum. Maintenance of catch basins and roads is important. Road salt should be applied cautiously to avoid contamination of Hall Meadow Brook.

Flood Hazard Areas

According to the Flood Insurance Rate Map, an area which ranges between approximately 100 feet to 300 feet wide and which parallels Hall Meadow Brook and the unnamed tributary in the western parts lies within the 100 year flood boundary. Any development in this part of the parcel should be totally discouraged by the Town.

Soil Resources

The site is dominated by deep glacial till soils. A band of alluvial soils is found along Hall Meadow Brook, and a band of glacial outwash soils follows the lower slopes and Brook. Although not defined as wetland soils, several "seepage areas" are of special concern. These areas may limit homes with basements and septic systems. Additional testing may be needed to locate suitable areas for development. Many lots may need diversions or curtain drains to control the large amount of water flowing through the property.

Erosion and Sediment Control

The proximity of Hall Meadow Brook makes erosion and sediment control during construction critical. The E&S plan included with the subdivision plan generally follows the guidelines. Additional comments and suggestions include: the need for additional sediment barriers, further planning for seasonal drainageways, proper outlets for subsurface drainage and obtaining a variance to omit the crossing of Brook Hill Road over Hall Meadow Brook.

Wetland Considerations

The majority of wetlands found on the upper slopes are drainage swales and intermittent watercourses. The lower portion of the site contains the floodplain wetlands of Hall Meadow Brook. The majority of the parcel contains

saturated conditions during certain portions of the year as shown by the drainage swales and channels. The U.S. Fish and Wildlife Service classifies the wetlands as Palustrine; forested; broad leaved deciduous; needle leaved evergreen; seasonally saturated. Total acreage of the wetlands is difficult to determine as many drainage swales lack wetland soil characteristics but could fall under the definition of a watercourse.

Wetland functions include drainage, wildlife habitat, sediment and water filtration, flood water storage and nutrient production and reclamation. The habitat is the most valuable function. The Brook is stocked by the Fisheries Bureau and contains native species as well. Development in or near the wetlands could result in impairment of the quality and functions.

Direct impacts to the wetlands include two proposed brook crossings and two driveway crossings of an upslope wetland. Roads, buildings and septic systems are planned for areas that have high seasonal water tables for a part of the year. The Brook crossings consist of box culverts and additional wetland filling. The driveways will cross a small wetland at the southern border of the site. Filling the wetlands will cause a loss of function provided by the wetlands. The construction of two crossings and upslope development will have a serious impact on Hall Meadow Brook. The impact is magnified by the fact that the area is relatively undisturbed.

Suggestions for reducing the wetland impacts include: using bridges instead of box culverts and reducing the number of crossings, proper erosion and sediment control, stormwater detention to minimize sediment and pollution inputs to the Brook and carefully engineered septic and well systems. The Commission needs to look closely at the plans and evaluate all feasible and prudent alternatives.

Forestry Resources

The entire site is wooded with tree species common to Connecticut. The value of the wood on the site is not high. Much of the property was logged in the past year, removing the higher value sawlogs. Most of the hardwoods originated from stump sprouts. This coupled with the remains of charcoal pits indicate that the entire site was clearcut 50 to 70 years ago. The vegetation plays an important part in the aesthetics of the area and enhances the water storage capacity. The woodlands also provide wood growth and wildlife habitat. The subdivision will complicate the alternatives for active resource management.

Area 1 is dominated by hemlock and sugar maple. Other species include ash, red maple, birch, aspen, blue beech and brambles. Area 2 contains maples, yellow birch and ash. This area appears to have been clearcut within the last 15 to 20 years perhaps with the idea of growing Christmas trees, for there are two patches of spruce here. Area 3 is dominated by sugar maple, black cherry, ash and beech. This is a good quality stand of trees.

Small parcels of land are more difficult to manage than large parcels. Owners often have different views of forest management. Therefore large lots are more desirable than small ones. Individual owners will be able to take advantage of the firewood growing on their lots. Each wooded acre should produce 1/2 to 3/4 of a cord of wood annually. Harvesting this amount in poorly formed and damaged trees will leave a healthier forest.

Areas with a high water table allow only shallow root penetration. Clearings in these areas should be avoided. The vegetation is sensitive to disturbance. Alterations in the wetlands may have a negative impact on the vegetation. Raising the water table may drown tree roots. Care should be taken to avoid altering the water table. Any cutting done on the property should be done to take advantage of the demand for wood products. Sawlogs and fuelwood will be the main products. A private forester or a public service forester may be of assistance in planning the cuts or marketing the wood products.

Fishery Resources

Hall Meadow Brook is classified as AA/A surface waters. Instream fisheries habitat includes random boulders, fallen and overhanging vegetation, undercut banks and pools. The vegetation provides shade and bank stabilization.

The Fisheries Bureau stocks Hall Meadow Brook with brook trout upstream and brook, brown and rainbow trout downstream of the site. The stream was sampled to determine the fishery populations. The brook supports brook trout, slimy sculpin, blacknose dace, longnose dace and creek chub. This area is unique because it supports three age classes of brown trout and the slimy sculpin which is considered a rare species in Connecticut.

Impacts from the development include loss of habitat resulting from box culverts at the two crossings, increased sedimentation, surface drainage from roads and driveways and transportation of lawn chemicals and fertilizers. Recommendations include using bridges in place of culverts, discouraging development in the immediate area of the tributary streams, maintaining a buffer zone along Hall Meadow Brook, following a comprehensive erosion and sediment control plan, designing and implementing an effective stormwater control plan, limiting the use of lawn chemicals near the brook and educating the homeowners in water conservation methods, especially during low precipitation periods.

Threatened and Endangered Plant and Animal Species

According to the DEP - Natural Diversity Database there are no Federally listed Endangered Species on the site. A Connecticut "Species of Special Concern," the slimy sculpin, was found within the study area.

Planning Considerations

The site is located in a rural residence zone. The surrounding land is also zoned for rural residential development. Surrounding land uses include undeveloped woodland, wetlands, a sawmill and several residences. The project appears to be compatible with existing and proposed land uses in the area except perhaps the sawmill. The noise generated by the sawmill can be heard from the site. The operator is concerned that possible restrictions on his business will be considered by future residents. To date there is no record of any complaints about the noise. The Town has no regulations concerning noise control. The Planning and Zoning Commission is urged to consider the matter and discuss the possible problems with the applicant, sawmill operator and DEP Noise Control Unit.

The State Policies Plan for the Conservation and Development of Connecticut, 1987-1992 identifies the area as "rural land." This designation allows development if it has on-site water and septic systems and is consistent with the rural character of the adjacent areas. The Hall Meadow Brook wetland system is identified as a preservation area. The project appears to be consistent with the state plan, the Litchfield Hills CEO preliminary housing policy and the zoning regulations of Norfolk.

Comments on the design include providing adequate site distances for safe access to the site, redesigning Lots 30 and 31 because of steep long driveways, driveway drainage plans for drives in excess of 15% and protection of Hall Meadow Brook with a conservation easement.

Traffic Considerations

Traffic engineering suggestions include providing the sitelines for the proposed roads and Route 272, providing sufficient turning radii for stopped and moving vehicles, stop signs and bars at the end of both roads, adequate width of Route 272 to pass stopped vehicles making left turns, conforming to the AASHTO Guidelines for the proposed drive profiles, allowing no driveways direct access to Route 272 and obtaining a permit from the DOT.

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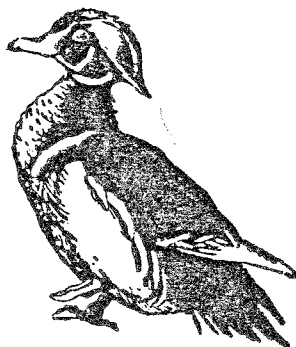
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INTRODUCTION



The review process consisted of four phases:

- (1) Inventory of the site's natural resources (collection of data).
- (2) Assessment of these resources (analysis of data).
- (3) Identification of resource problem areas.
- (4) Presentation of planning and land use guidelines.

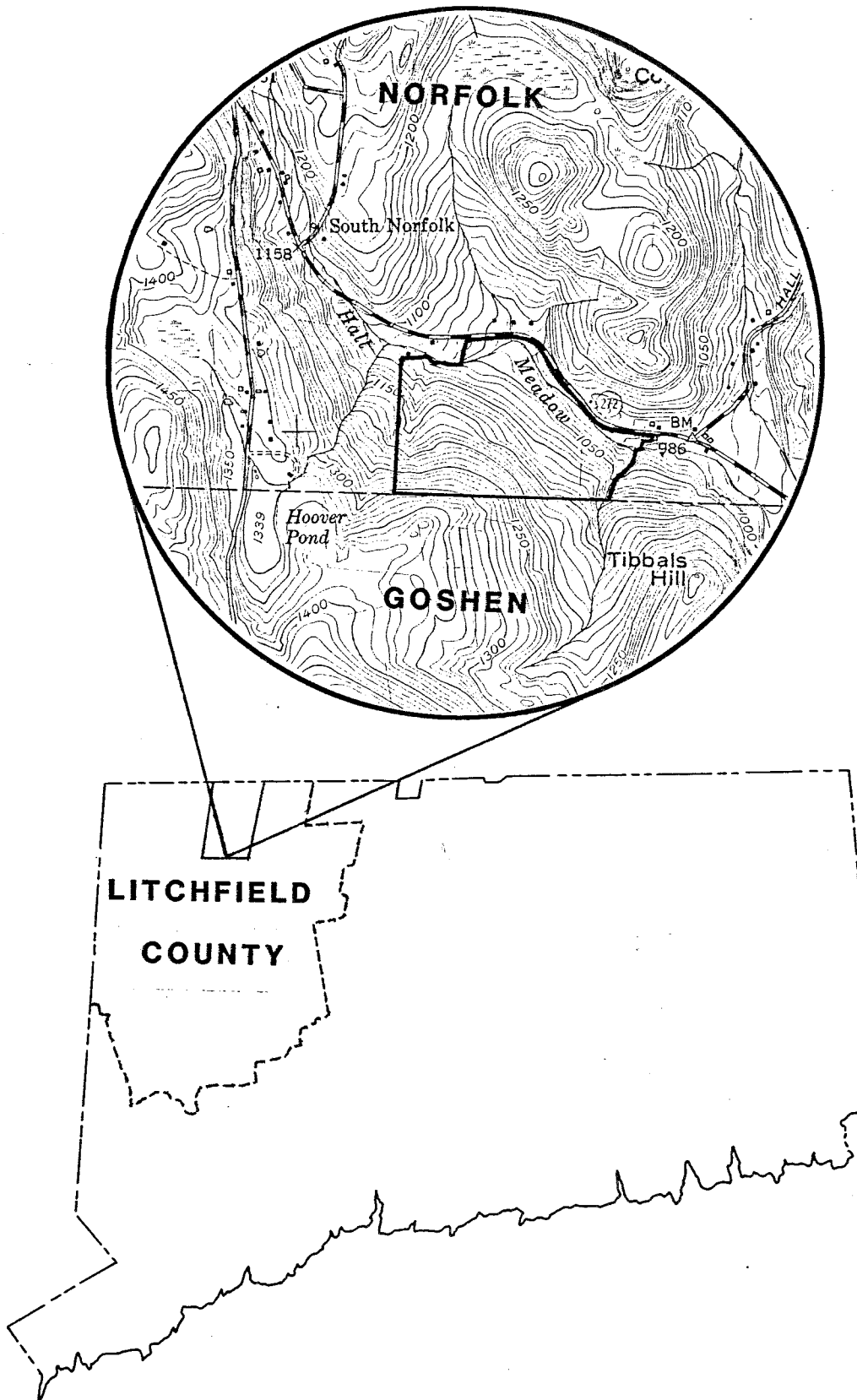
The data collection phase involved both literature and field research. The ERT field review took place on May 11, 1988. Field review and inspection of the proposed development site proved to be a most valuable component of this phase. The emphasis of the field review was on the exchange of ideas, concerns or alternatives. Mapped data or technical reports were also perused and specific information concerning the site was collected. Being on site also allowed Team members to check and confirm mapped information and identify other resources.

Once the Team members had assimilated an adequate data base, it was then necessary to analyze and interpret their findings. The results of this analyses enabled the Team members to arrive at an informed assessment of the site's natural resource development opportunities and limitations. Individual Team members then prepared and submitted their reports to the ERT Coordinator for compilation into the final ERT report.

The primary goal of this ERT is to inventory and assess existing natural resources occurring on the site as well as providing planning and traffic/access information. Specific objectives include:

- (1) assessment of the geological characteristics of the site, including geological development limitations and opportunities for roads and houses;
- (2) assessment of the hydrological characteristics of the site, including wetland hydrology and stormwater drainage;

Figure 1
LOCATION OF STUDY SITE



BARKER'S CROSSING SUBDIVISION

NORFOLK, CONNECTICUT

PROPOSED SITE PLAN

King's Mark Environmental Review Team

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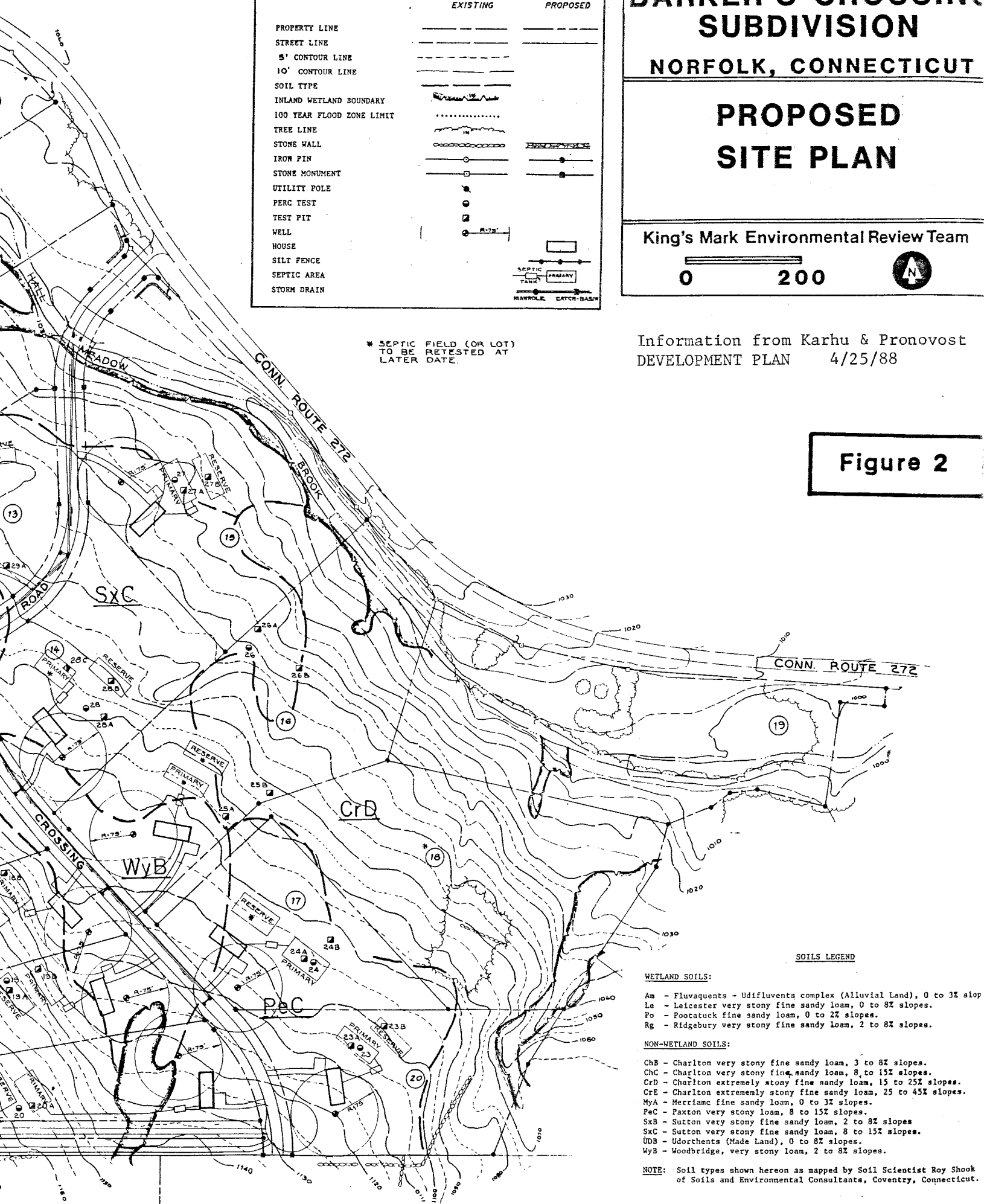


	EXISTING	PROPOSED
PROPERTY LINE	—————	- - - - -
STREET LINE	—————	—————
5' CONTOUR LINE	—————	—————
10' CONTOUR LINE	—————	—————
SOIL TYPE	—————	—————
INLAND WETLAND BOUNDARY	~~~~~	~~~~~
100 YEAR FLOOD ZONE LIMIT
TREE LINE	~~~~~	~~~~~
STONE WALL	—————	—————
IRON PIN	—————	—————
STONE MONUMENT	—————	—————
UTILITY POLE	●	●
PERC TEST	○	○
TEST PIT	□	□
WELL	○	○
HOUSE	□	□
SILT FENCE	—————	—————
SEPTIC AREA	—————	—————
STORM DRAIN	—————	—————

* SEPTIC FIELD (OR LOT)
TO BE RETESTED AT
LATER DATE.

Information from Karhu & Pronovost
DEVELOPMENT PLAN 4/25/88

Figure 2



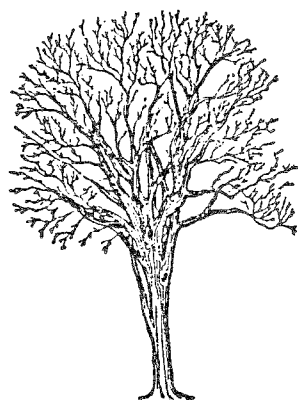
SOILS LEGEND

- WETLAND SOILS:**
- Am - Fluvaquents - Udifluvents complex (Alluvial Land), 0 to 3% slopes.
 - Le - Leicester very stony fine sandy loam, 0 to 8% slopes.
 - Po - Pootatuck fine sandy loam, 0 to 2% slopes.
 - Rg - Ridgebury very stony fine sandy loam, 2 to 8% slopes.
- NON-WETLAND SOILS:**
- ChB - Charlton very stony fine sandy loam, 3 to 8% slopes.
 - ChC - Charlton very stony fine sandy loam, 8 to 15% slopes.
 - CrD - Charlton extremely stony fine sandy loam, 15 to 25% slopes.
 - CrE - Charlton extremely stony fine sandy loam, 25 to 45% slopes.
 - MyA - Merriam fine sandy loam, 0 to 3% slopes.
 - PeC - Paxton very stony loam, 8 to 15% slopes.
 - SxB - Sutton very stony fine sandy loam, 2 to 8% slopes.
 - SxC - Sutton very stony fine sandy loam, 8 to 15% slopes.
 - UdB - Udorthents (Made Land), 0 to 8% slopes.
 - WyB - Woodbridge, very stony loam, 2 to 8% slopes.

NOTE: Soil types shown hereon as mapped by Soil Scientist Roy Shook of Soils and Environmental Consultants, Coventry, Connecticut.

- (3) determination of the suitability of existing soils to support the proposed development;
- (4) discussion of soil erosion and sedimentation concerns;
- (5) assessment of the impact of the development on the wetlands and rivers;
- (6) assessment of the impact of the development on the fisheries/habitat; and
- (7) assessment of planning and land use issues, including traffic and access.

PHYSICAL CHARACTERISTICS



SETTING, LAND-USE AND TOPOGRAPHY

The proposed 31 lot subdivision consists of approximately 96 acres in southern Norfolk. The Goshen town line forms the southern boundary of the property. Other property boundaries include Route 272 on the north and private, undeveloped land on the east and west.

The site is located in a zone which allows residential development with minimum lot sizes of 2 acres. Present plans indicate that the proposed lots will range in size from 2.0 acres to 5.9 acres. Barker's Crossing, which originates off Route 272 and terminates at the southern boundary, is the main feeder road to the subdivision. A cul-de-sac called Brook Hill Road will feed interior lots in the western portions of the site. At its intersection with Barker's Crossing, it will continue northeast, cross Hall Meadow Brook and connect to Route 272 (see Figure 2).

The proposed subdivision site is entirely wooded, consisting primarily of second growth hardwoods with some stands of hemlock. Hall Meadow Brook, a perennial streamcourse, flows through the northern sections in an easterly direction enroute to Hall Meadow Brook Reservoir.

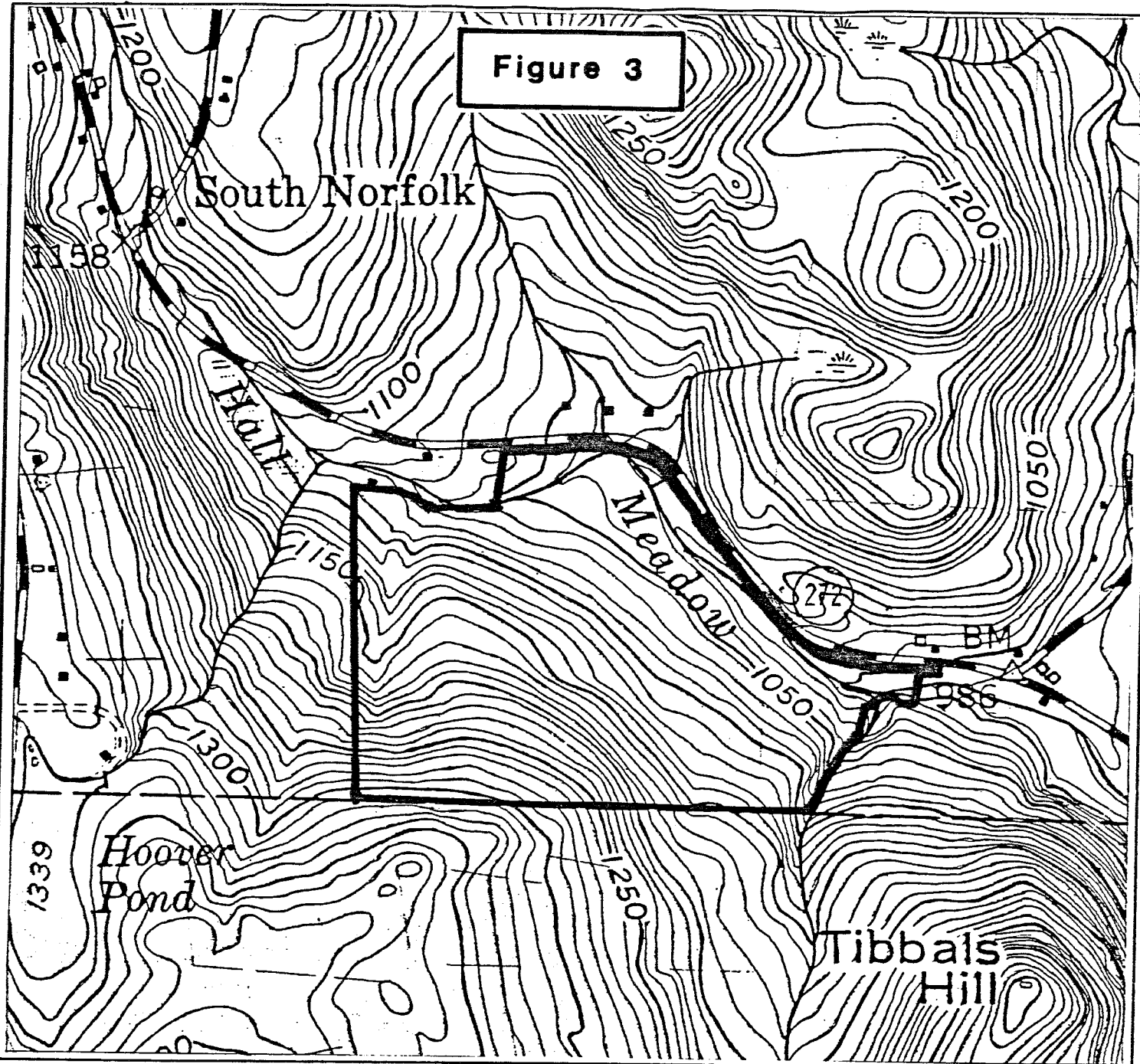
The land surface on the site generally slopes northward to Hall Meadow Brook. The slopes are quite variable throughout the site, ranging from moderate to steep. Steep slopes occur at the southern limits and north central sections and are controlled by the underlying bedrock. Bedrock outcrops occur in this area. Site elevations range from a high of about 1,265 feet above mean sea level at the southern property boundary to a low of about 1,000 feet above mean sea level along Hall Meadow Brook at the northeast corner (see Figure 3).

The major watercourse on the site is Hall Meadow Brook. A few north flowing drainageways, which are tributary to Hall Meadow Brook, also occur on the site. These streamcourses (perennial and temporary) and their accompanying wetlands have been flagged in the field by a certified soil scientist. Their boundaries have been superimposed onto the subdivision plan. According to present plans, Hall Meadow Brook will be crossed by Barker's Crossing and Brook Hill Road. Except for Lots 30 and 31, it appears that most of the proposed driveways can be constructed without crossing regulated wetlands. The latter crossings will depend largely on the ultimate house location on each lot. It is understood that Norfolk regulations require a 75 foot setback between regulated wetlands and septic systems and a 25 foot setback between wetlands and building structures.

GEOLOGY

The subdivision site is located within the Norfolk topographic quadrangle. A bedrock geologic map (U.S. Geological Survey Map, GQ 1518 by David S. Harwood) and a surficial geologic map (U.S. Geological Survey Map GQ-983 by C.R. Warren, 1970) of the quadrangle have been published. The bedrock underlying the site is interpreted to be part of the Berkshire Massif (see Figure 4). Most of the bedrock consists of a well-layered, black and white, rough-ribbed medium to coarse-grained gneiss composed of the minerals hornblende, plagioclase, quartz, biotite, epidote, sphene, magnetite, apatite, zircon and, locally, garnet. The northern limits of the site are underlain by a similar rock but which has a finer texture and slightly different mineralogic composition. It is described as a fine to medium grained, light and dark gray,

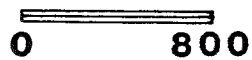
Figure 3



**BARKER'S CROSSING
SUBDIVISION
NORFOLK, CONNECTICUT**

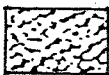
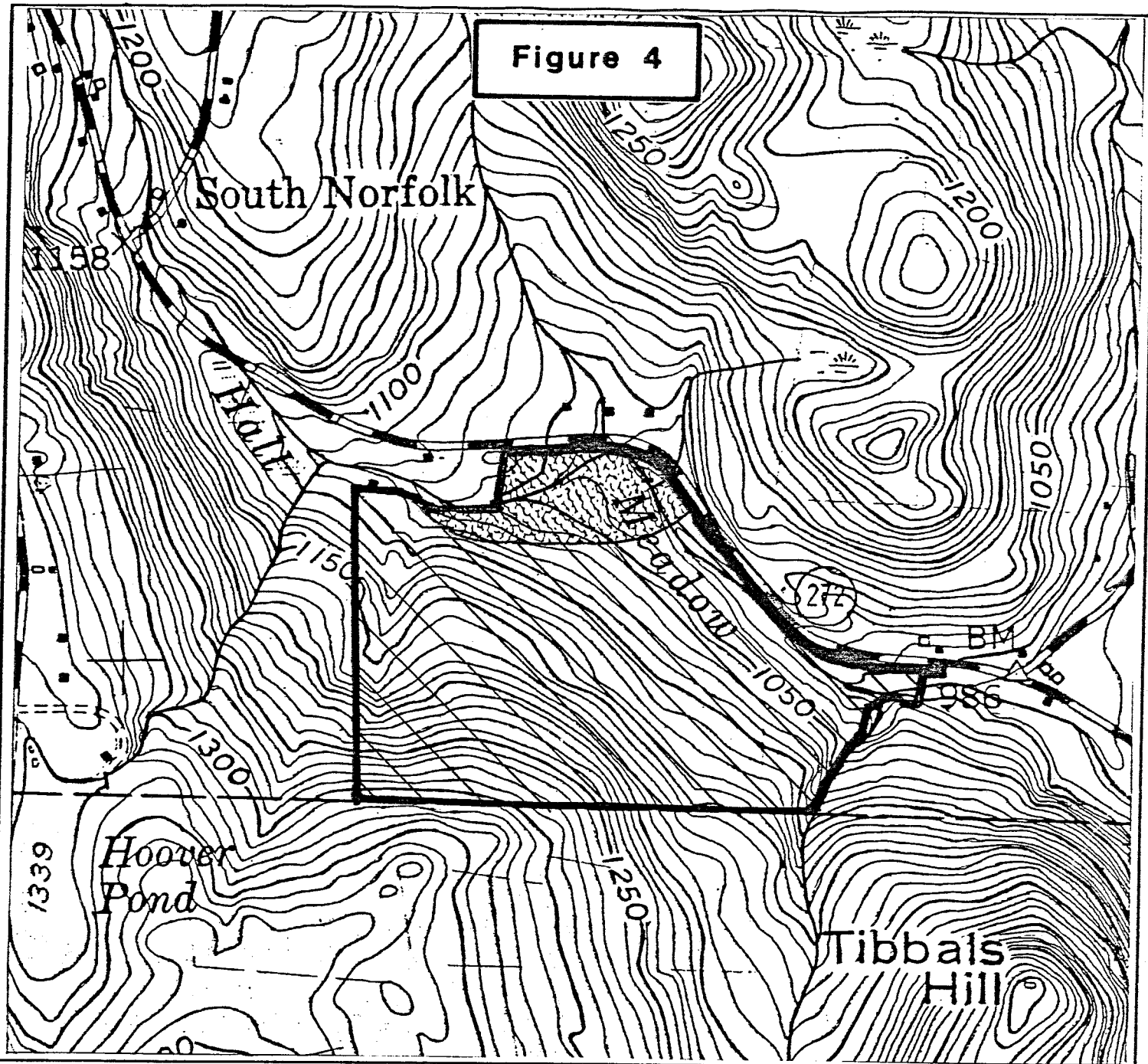
TOPOGRAPHY

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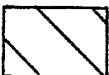


Information from USGS Topographic Map
Norfolk Quadrangle

Figure 4



FINE TO MEDIUM GRAINED, LIGHT AND DARK GRAY, STRONGLY LAYERED TO FAINTLY LAYERED, WHISPY AND STREAKED BIOTITE-RICH GNEISS



WELL LAYERED, BLACK AND WHITE, ROUGH-RIBBED, MEDIUM TO COARSE GRAINED GNEISS

BARKER'S CROSSING SUBDIVISION

NORFOLK, CONNECTICUT

BEDROCK GEOLOGY

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strongly layered to faintly layered, wispy and streaked biotite-rich gneiss. Other minerals include quartz, plagioclase, sphene, zircon, magnetite, apatite and minor amounts of hornblende and microcline.

The term gneiss refers to the texture of the rock. "Gneisses" are generally medium to coarse grained, foliated rock characterized by alternating bands of light and dark minerals. Gneisses are metamorphic rocks, which means they have been generally altered by great heat and pressure within the earth's crust.

There were about 8 lots where the bedrock surface was encountered between depths of 2 feet and 6 feet below ground surface. The bedrock surface was not encountered in the proposed building area for the remainder of lots.

The underlying bedrock is a source of water to many homes in town and will be the likely source of domestic water to houses in the proposed subdivision.

Overlying the bedrock on most of the site is a loose to compact glacial sediment known as till (see Figure 5). Till is a glacial sediment that was deposited directly from glacial ice. The sediment consists of varying proportions of sand, silt, gravel, clay and boulders. Particles of different sizes are generally mixed together in complex fashion. According to the soil survey for Litchfield County and project soil scientist's report, the texture of the till on the site ranges from sandy, stony and moderately loose to silty, moderately stony and compact. The latter type of till is characterized by a "hardpan" layer which has developed at a relatively shallow depth (1.5-2.0 feet below ground surface). Because of the low permeability of the "hardpan" layer, the soil zone above the "hardpan" layer becomes saturated with groundwater during the wet time of year. On the other hand, the sandy, moderately loose variety of till found on the site lacks the "hardpan" layer and is not usually

characterized by a seasonally high water table. It should be pointed out that the area comprised of Sutton soils is characterized by an elevated water table, but does not have a compact soil layer.

The looser, sandier variety of till covers the area delineated as Charlton and Sutton soils of the subdivision plan. The remainder of the site is characterized by the finer grained compact variety of till, which comprises Paxton and Woodbridge soils. It should be noted that a small area of stratified drift deposits (sand and gravel) occurs at the rear portions of Lot 10. These deposits were laid down by glacial meltwater in the Hall Meadow Brook Valley.

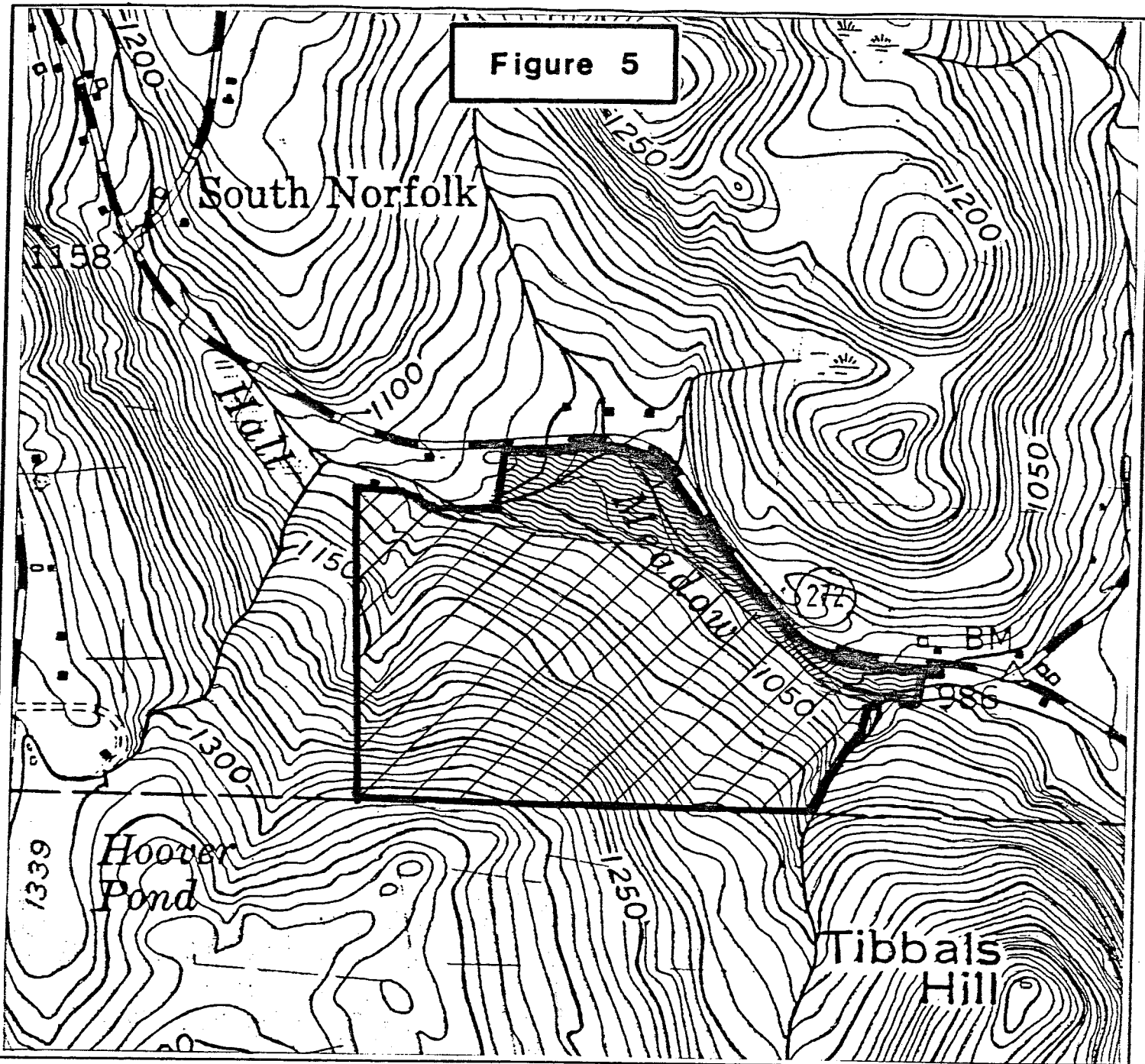
Overlying the till soils on the site primarily along Hall Meadow Brook and its small tributaries are regulated inland wetland soils. Because these soils are wet most of the year, they hold low potential for any type of development.

GEOLOGIC DEVELOPMENT CONCERNS

In terms of the proposed residential subdivision, the major geological limitations found on the parcels include: 1) areas where bedrock is at or near the surface of the ground; 2) areas of moderate to steep slopes; 3) the presence of some compact till soils, which commonly results in elevated ground water tables and which have slow percolation rates; and 4) areas of permanent or seasonal wetness (regulated inland wetland soils).

These geologic limitations will weigh heaviest on the ability to provide adequate subsurface sewage disposal systems serving homes constructed in the subdivision since public sewers are not available. In some cases, proper planning and engineering can overcome these limitations. According to the

Figure 5



TILL



STRATIFIED DRIFT
(SAND & GRAVEL)

BARKER'S CROSSING SUBDIVISION

NORFOLK, CONNECTICUT

SURFICIAL GEOLOGY

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Prior to subdivision approval, the applicant, through his engineering firm, must show that each proposed lot meets the minimum soil standards in accordance with Section 19-12-B103e(a)(3) of the Public Health Code. Each lot should be able to hydraulically disperse the expected discharge from the homes' sewage disposal system into the site's natural soil layers per Section 19-13-B103e(a)(4) of the Code.

The process should be a coordinated effort between the design engineer and the local health department (sanitarian). Because most of the lots fall within an "area of special concern" identified by the State Public Health Code, plans for the design of the subsurface sewage disposal facilities (along with the placement of each on-site well water supply) must be prepared by a professional engineer and submitted to the health department for review and approval by their certified staff.

The final configuration of lots should not be approved until the health department is assured of the feasibility of each lot meeting all of the State Health Code requirements and above listed concerns.

Once septic systems are engineered and approved by the proper authorities (i.e., state and local health department), it is important that the systems be installed properly, according to design specifications, and be properly maintained (e.g., pumped every 3-5 years by the homeowners).

Interior roads, utility lines and house foundations constructed in shallow bedrock areas may require blasting. Any blasting which takes place in the study area should be done only under the supervision of personnel familiar with the latest technology in blasting. This should reduce the chance for damage from undue seismic shock and air blast. A pre-blast survey of the area would also be wise to minimize the chance for damage claims.

Based on the plot plan submitted to team members, Barker's Crossing and Brook Hill Road will need to cross Hall Meadow Brook and its accompanying wetland/floodplain in order to access the subdivision site. These wetland/stream crossings will be at the intersection of the road with Route 272. It also appears that driveways serving Lots 30 and 31 will need to cross regulated wetlands in order to access the lots. Wetland crossings for the latter are feasible and can be accomplished without much damage to wetlands provided they are properly designed (e.g., culverts are properly sized and installed and permeable road base fill material is used). The driveways should be constructed at least 1.5 feet and preferably 2 feet above the surface elevation of the wetlands. This will allow for better drainage of the roads and decrease the frost heaving potential of the road. It is recommended that any road construction through wetland areas be done during the dry time of year with adequate provisions for effective erosion and sediment control. It is strongly suggested that the applicant be required to submit detailed plans for all wetland crossings. The plans would indicate specific site development details, erosion and sediment control measures, fill lines, amount of fill to be placed, the impacts of filling, watercourse channel location and flow direction, disturbed areas, etc. Approved wetland activity needs to be closely monitored by town officials. Consideration should be given to a shared driveway for Lots 30 and 31 to minimize wetland disturbance in the area.

Two major wetland/stream crossings (Hall Meadow Brook) warrant careful examination. Generally speaking, the same measures discussed in the preceding paragraph apply, however, they will be of larger scale and affect a much greater area of wetlands/floodplain. The impacts of such activity need to be carefully examined. As discussed on the review day, consideration should be

given to eliminating the Brook Hill Road crossing of Hall Meadow Brook. Perhaps a driveway between Lots 13 and 14 could be constructed to serve Lot 15, thus eliminating the crossing of Hall Meadow Brook and its wetlands

A possible alternative which should be studied is the use of prefabricated concrete bridges for the major wetland crossings. Although it may be more costly, it seems likely that there would be less disturbance of wetlands from filling activity in these areas.

Because these soils are classified as inland wetland soils in Connecticut, they are regulated under Public Act 155. Any activity which involves modification, filling, removal of soils, etc., will require a permit and ultimate approval by the Town's Inland Wetland Commission. In reviewing a proposal, the Commission needs to determine the impact that the proposed activity will have on the wetlands. If the Commission determines that the wetland is serving an important hydrological or ecological function and that the impact of the proposed activity will be significant, they may deny the activity altogether or, at least, require measures that would minimize the impact.

If one acre or more of wetlands is filled, modified, etc., there is a possibility that a U.S. Army Corps of Engineers' permit will be required (see Wetlands Considerations section).

WATER SUPPLY

The underlying bedrock appears to be the most suitable aquifer to serve the proposed 31 individual water supply wells. Obtaining water from any given bedrock well is dependent upon the number and size of water transmitting

fractures that are encountered by the well. The metamorphic rock underlying the site responds to geologic forces by fracturing, folding and forming distinct open joints. If the underlying rock contains continuous and interconnected fractures and joints, the availability of groundwater for domestic uses should be good. In the Lower Housatonic River Basin, 294 wells were surveyed for Connecticut Water Resources Bulletin No. 19. Of all those wells surveyed that tapped a type of bedrock similar in physical characteristics to the bedrock underlying the site, 90 percent yielded 1.5 gallons per minute or more, 78 percent yielded 3.0 gallons per minute or more and 20 percent yielded 12 gallons per minute or more. Generally, a yield of 3 gallons per minute is satisfactory for domestic purposes.

The initial quality of the water probably would be good in most cases. However, because of the geologic limitations, the chance for effluent contamination is possible, particularly if special care is not taken with respect to septic system design and installation and well installation. Proper well construction and separating distances in accordance with State Public Health Code, Connecticut Well Drilling Board and Town regulations will allow for adequate protection of the quality of the bedrock aquifer.

It should be pointed out that there may be a possibility of undesirably high mineral (particularly iron or manganese) content in the rocks underlying the site. Should well water prove to be high in mineral content, several filtration methods are available to overcome such problems.

HYDROLOGY

Presently, surface runoff from the site flows downslope to Hall Meadow Brook. It flows overland by sheetflow or is intercepted by drainageways which transport the water to Hall Meadow Brook (see Figure 6). According to the

engineer's report, Hall Meadow Brook drains an area of 4 square miles or 2,560 acres from its intersection with the proposed culvert on Brook Hill Road. At this point, the property (about 52.0 acres) represents 2 percent of the watershed.

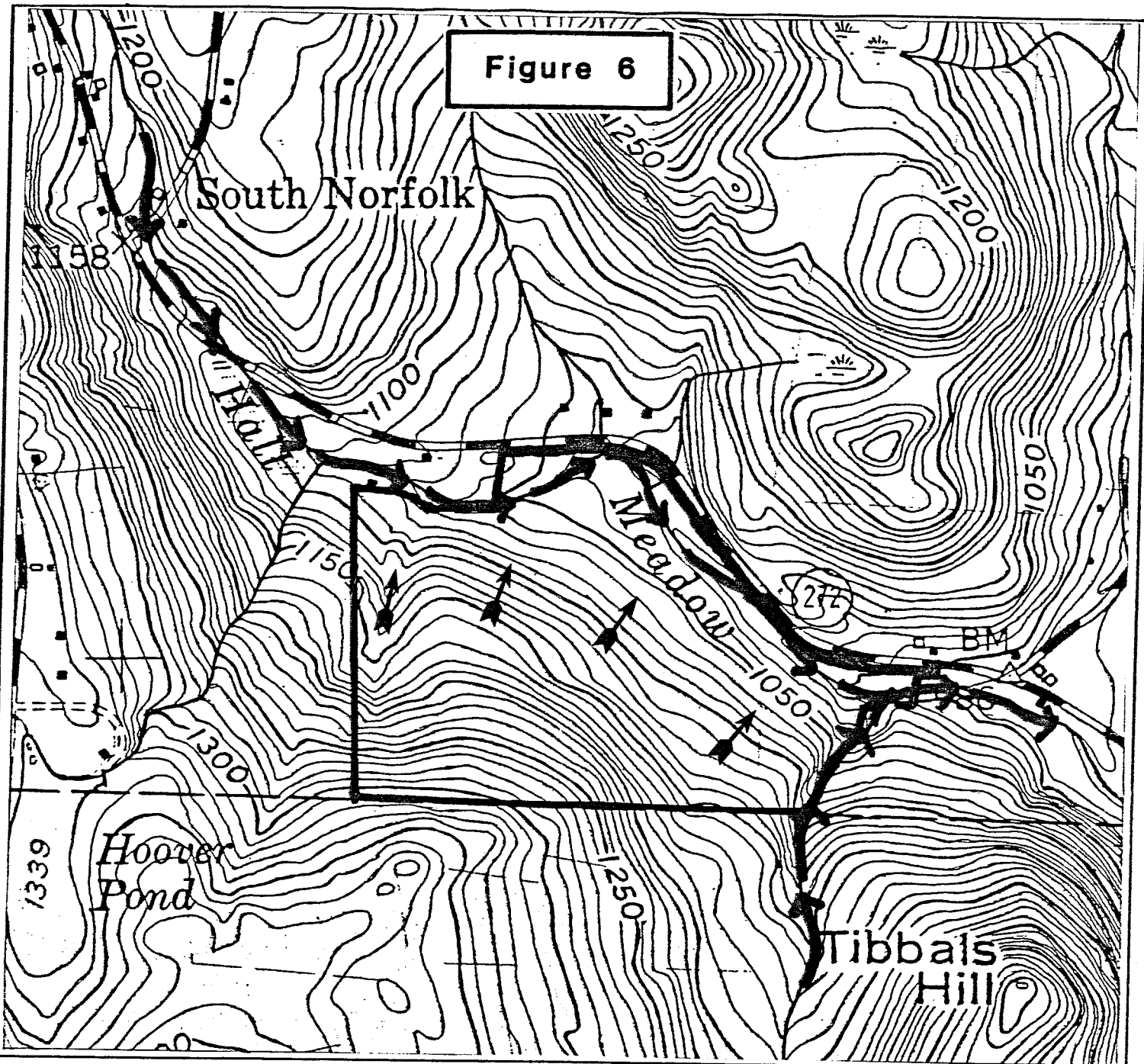
Groundwater in the area is classified by the DEP as GA, which means that it is suitable for private drinking water supplies without treatment. As a result, discharge of household sewage to the subsurface from homes in the proposed subdivision will need to be handled with great care.

The applicant's engineer has demonstrated that development of the site for residential use will lead to increases in the amount of runoff shed from the parcel. The amount of increases will depend upon the extent of development, the impervious surfaces created and the amount of vegetation removed or preserved. Present plans indicate that road drainage will be artificially collected and outletted to Hall Meadow Brook at the proposed road crossing. It is not known if roof gutters will be discharged to road drainage.

The two major concerns associated with increased runoff are the potential for flooding downstream and streambank erosion/gullying.

The developer of the parcel should analyze the lots individually and collectively. The need for detention should be based on density, amount of wetlands and associated storage and calculated runoff increases. If detention is warranted, it should be located where its effects would be maximized and its impact on the wetland minimized. Ideally, if detention basins are required to handle post-development flows, they should be located on upland soils. However, because of the steep slopes and shallow to bedrock soils, it may not be possible to do this. As a result, there may be a need to use wetland pockets within the site as detention areas. Finally, all downstream culverts should be carefully examined.

Figure 6



MAJOR WATERCOURSES
SHOWING DIRECTION OF FLOW



DIRECTION OF SURFACE FLOW

BARKER'S CROSSING SUBDIVISION

NORFOLK, CONNECTICUT

WATERSHED HYDROLOGY

King's Mark Environmental Review Team

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feet wide and which parallels Hall Meadow Brook and the unnamed tributary in the western parts lies within the 100 year flood boundary. Any development in this part of the parcel should be totally discouraged by the Town.

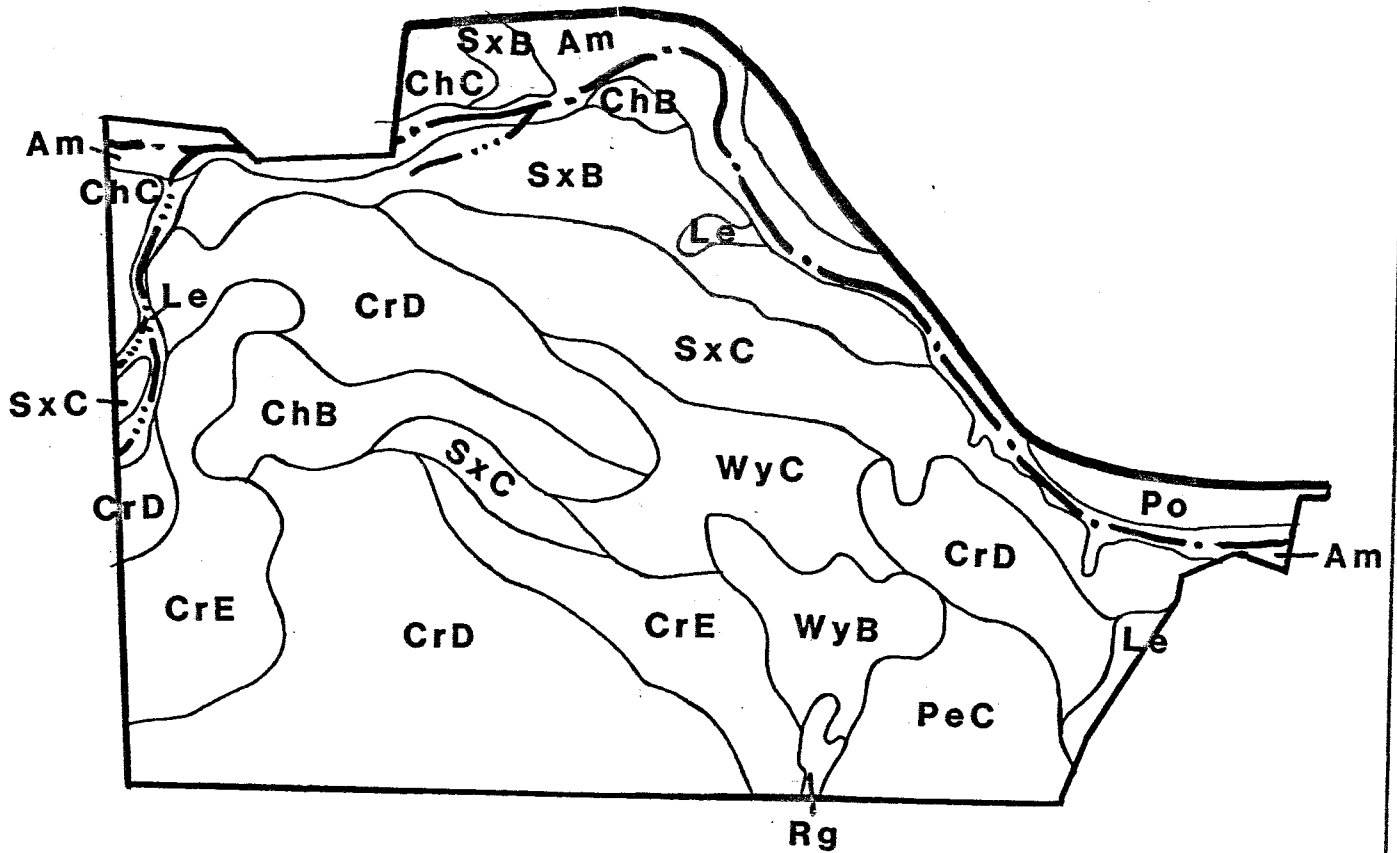
SOIL RESOURCES

The landscapes of the Barker's Crossing Subdivision are dominated by deep, gently sloping to steep glacial till soils with loose friable substratums to firm dense substratums (hardpan). The soils range from well drained to poorly drained. A narrow band of alluvial (floodplain) soils are along Hall Meadow Brook. Small areas of glacial outwash soils with sand and gravel substratums are along the lower slopes and the brook.

The soil map (Figure 7) has been created from on-site investigation, air photo interpretation and information provided by Environmental Resource Associates. This map can be used for general discussion of soil limitations on this parcel. All discussions about inland wetland locations and boundaries should use the wetland boundaries mapped by Environmental Resource Associates. A chart of important soil features and interpretations has been prepared (Appendix A). Many of the map unit symbols and names are unique to this report and cannot be used in other areas. Below is listed some additional soils information and concerns:

- 1) Many of the map units dominated by Charlton soils have a higher seasonal high water table than is typical for the series. This may be due to dense till materials more than 60 inches below the surface. Where dense till is within 40 inches, there are inclusions of Paxton and Woodbridge soils in areas mapped ChC, CrD, and ChB.
- 2) Included in areas mapped SxB and SxC are soils with a firm dense substratum (Woodbridge soils).
- 3) Included in areas mapped CrD are areas of soils moderately deep (20 to 40 inches) to bedrock.

Figure 7



- Am - FLUVAQUENTS-UDIFLUVENTS COMPLEX, 0 TO 3% SLOPES *
- ChB - CHARLTON VERY STONY FINE SANDY LOAM, 3 TO 8% SLOPES
- ChC - CHARLTON VERY STONY FINE SANDY LOAM, 8 TO 15% SLOPES
- CrD - CHARLTON EXTREMELY STONY FINE SANDY LOAM, 15 TO 25% SLOPES
- CrE - CHARLTON EXTREMELY STONY FINE SANDY LOAM, 25 TO 45% SLOPES
- Le - LEICESTER VERY STONY FINE SANDY LOAM, 0 TO 8% SLOPES *
- PeC - PAXTON VERY STONY LOAM, 8 TO 15% SLOPES
- Po - POOTATUCK FINE SANDY LOAM, 0 TO 2% SLOPES
- Rg - RIDGEBURY VERY STONY FINE SANDY LOAM, 2 TO 8% SLOPES *
- SxB - SUTTON VERY STONY FINE SANDY LOAM, 2 TO 8% SLOPES
- SxC - SUTTON VERY STONY FINE SANDY LOAM, 8 TO 15% SLOPES
- WyB - WOODBRIDGE VERY STONY LOAM, 2 TO 8% SLOPES
- WyC - WOODBRIDGE VERY STONY LOAM, 8 TO 15% SLOPES

* WETLAND SOILS

BARKER'S CROSSING SUBDIVISION

NORFOLK, CONNECTICUT

SOILS

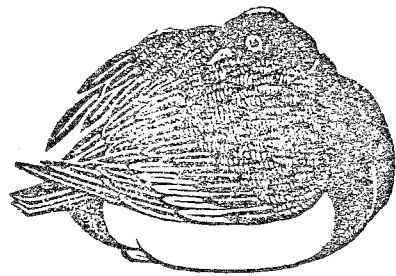
King's Mark Environmental Review Team

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- 6) The E&S narrative (Karhu and Pronovost Associates, Inc. 4/88) states the maximum grade for rock lined slopes to be 1:5. This should be changed to 1.5:1.
- 7) The driveway grading plan for Lots 30 and 31 should be shown to determine if driveway construction is feasible with the current lot layout. The Sanitary Engineer's report (Saglimeni, 4/88) states ledge was hit on test pits for both these lots. This indicates blasting may be needed for driveway cuts.
- 8) A culvert is needed for the driveway crossings for Lots 30 and 31, where these driveways cross the wetland. A sediment barrier should be shown as an E&S control for this wetland crossing.
- 9) A seasonal high water table was stated as a concern on most of the lots in the subdivision. Subsurface drainage may be proposed by the engineer for proper functioning of septic systems. These drains should be designed to have proper outlets which do not cause erosion problems.
- 10) The Brook Hill Road crossing over Hall Meadow Brook is a direct disturbance to Hall Meadow Brook which will cause sedimentation to the stream during construction and be a permanent constriction to the stream. If it is possible to comply with Zoning Regulations or obtain a variance to the regulations to omit this crossing over Hall Meadow Brook, this is recommended from an environmental stand point.
- 11) No calculations were submitted for review which show how the net increase of 15 cubic feet per second (cfs) was obtained for post development runoff.

BIOLOGICAL RESOURCES



The total area which could be defined as a wetland or watercourse on this site is approximately 11.3 acres. An accurate estimation of these areas is difficult due to the existence of numerous intermittent and seasonal drainage swales which do not possess wetland soil types, but could fall under the definition of a watercourse.

Wetland Functions

The wetland areas which are found on this site primarily act as intermittent drainageways for surface runoff and groundwater seepage. In addition to providing drainage, these wetlands act as areas of wildlife habitat, sediment and water filtration, nutrient production and reclamation and flood water storage along portions of Hall Meadow Brook.

The habitat provided by this area is its most valuable function and is of excellent quality. This fact is due largely to the presence of Hall Meadow Brook which runs through the site. This brook, which is stocked by the Fisheries Bureau twice a year, is an outstanding habitat for Brook Trout and other native and introduced fish species. The wetlands adjacent to this brook are not classic wetland habitat areas, but do perform vital functions in association with the brook and the surrounding watershed. They convey runoff water into the brook, act as a filtration device within the watershed and possess some water storage capacity during storm events. Therefore, any development in and/or near these areas could result in serious consequences to the quality and function of these wetlands.

Development Impacts

The wetland impacts from this development will be significant and could result in permanent degradation to the functional capacities of this area. Direct impacts take the form two proposed brook crossings and two driveway

crossings over an upslope portion of wetlands. In addition, much of the road, building and septic system construction will occur in areas which experience extreme wet conditions for certain periods during each year, despite their lack of wetland soil designation. Such activities in these areas could result in long term disturbance to the brook and the surrounding watershed.

The first brook crossing is proposed on the northern end of the site, coming off of State Route 272, and connecting onto an existing logging path. This crossing will be approximately 50 feet long and 40 feet wide, consisting of two 6' X 10' X 20' box culverts and some additional wetlands filling. The second crossing is located on the northeastern portion of the site, also accessing State Route 272, and will be approximately 200 feet long and 40 feet wide. This crossing will also consist of two 6' X 10' X 20' box culverts, but will require a substantial amount of flood plain wetlands filling on both sides of the brook in order to access the upland areas. The driveway crossings are over a small portion of forested wetlands in Lot 21, approximately 800 feet upslope from the brook along the southern border of the site, and will be used to access two rear Lots, 30 and 31.

In all cases of wetlands filling there is an obvious net loss in the functions provided by that wetland. In this case, the filling of wetlands and the development of the surrounding uplands could result in wetland and environmental damage which will exceed the loss of functional area filled. The construction of two box culvert crossings and the development of the surrounding hillside will have serious impacts on the habitat quality in Hall Meadow Brook and the surrounding area. This impact is magnified due to the fact that this area is relatively undisturbed, despite the existence of forest management practices for logging purposes. Its proximity to large tracts of undisturbed land and its function as a wildlife corridor to Hall Meadow Brook only increase its viability as a valuable habitat area.

The driveway crossings in the upland portions of the site, though not large, will reduce filtration capacity and increase sediment and pollution flow in to the wetlands and eventually Hall Meadow Brook.

Recommendations and Conclusions

- 1) In light of the quality and function of Hall Meadow Brook and its associated wetlands, it is highly recommended that the use of bridges rather than box culverts be explored in order to limit the long term permanent disturbance to the brook. In addition, a petitioning of the town planning and zoning commission is recommended, in an attempt to secure a waiver of certain access requirements. Such a waiver should be sought for one access road onto the site. It may be prudent in this situation to allow for one bridged access road rather than two culverted crossings in light of the severe environmental impacts which are at stake.
- 2) Due to the steep slopes of the site, proper sediment and erosion control will be crucial in limiting the potential for significant sediment pollution problems in Hall Meadow Brook. Construction activities should be performed at the driest time of the year in order to reduce the potential for sediment and erosion problems.
- 3) The wetlands commission should consider the development of some form of detention structure outside of the wetlands for stormwater runoff from the site. This would help to minimize the sediment and pollutant load of waters leaving the site before they reach Hall Meadow Brook. If no such structure is installed the water quality will be reduced and subsequently degrade the habitat value of the stream.
- 4) All septic and well systems to be installed on site should be carefully engineered and their construction closely monitored so that potential risks to wetlands and watercourses are minimized.

Overall this project does appear to present a great deal of risk to the wetlands and surrounding environment. The wetlands commission should consider if the risks involved are in line with the limits set forth in the State's Inland Wetlands and Watercourses Act, Section 22a-36 through 22a-45 inclusive. Feasible and prudent alternatives do appear to exist for this site and should be thoroughly explored before a final decision is made.

FORESTRY RESOURCES

Vegetation

The vegetation involved with the proposed Barker's Crossing Subdivision has been divided into three broad forest cover types (see Figure 8). Each is described in more detail below. In general terms the parcel is entirely wooded with tree species commonly found in Connecticut such as sugar maple, beech, black cherry, hemlock, ash and an occasional aspen. On any given site the dominance of one species over another is primarily dictated by the depth of soil to the underlying water table. Areas with a high water table tend toward higher concentrations of hemlock. As the soil dries out, the hardwood component becomes dominant.

Commercially, the present value of the wood on the property is not high. Much of the property was commercially logged within the past year, and this process removed some of the higher value sawlogs. Generally the size of the trees now range from 6 to 16 inches in diameter measured at breast height (dbh). The pole sized trees (6 to 10 inches dbh) and small sawtimber trees (trees > 12 inches dbh) will gain in value as they grow larger. Poletimber is the traditional firewood sized trees, and the value of the standing firewood is not high. The quality of the hardwood stems in area #3 is high because conditions here are excellent for growing trees.

Judging from the fact that most of the hardwood trees on the site have originated from stump sprouts, the remains of several charcoal pits, coupled with the history of many of the county's woodlands, this forest was completely cutover (clearcut) 50 to 70 years ago. This clearcutting of the forest was common practice for over 100 years and provided the raw material needed to make charcoal for a growing industrialized state.

The large expanse of diverse vegetation on this property plays an important role in the aesthetics of the area and enhances the water storage capacity of the landscape. In addition, the woodland provides a rich renewable resource in the form of wood growth and a diversified wildlife habitat. These amenities can be enhanced whether the land stays as is or is developed as planned. The subdivision of a large parcel complicates the alternatives for active resource management.

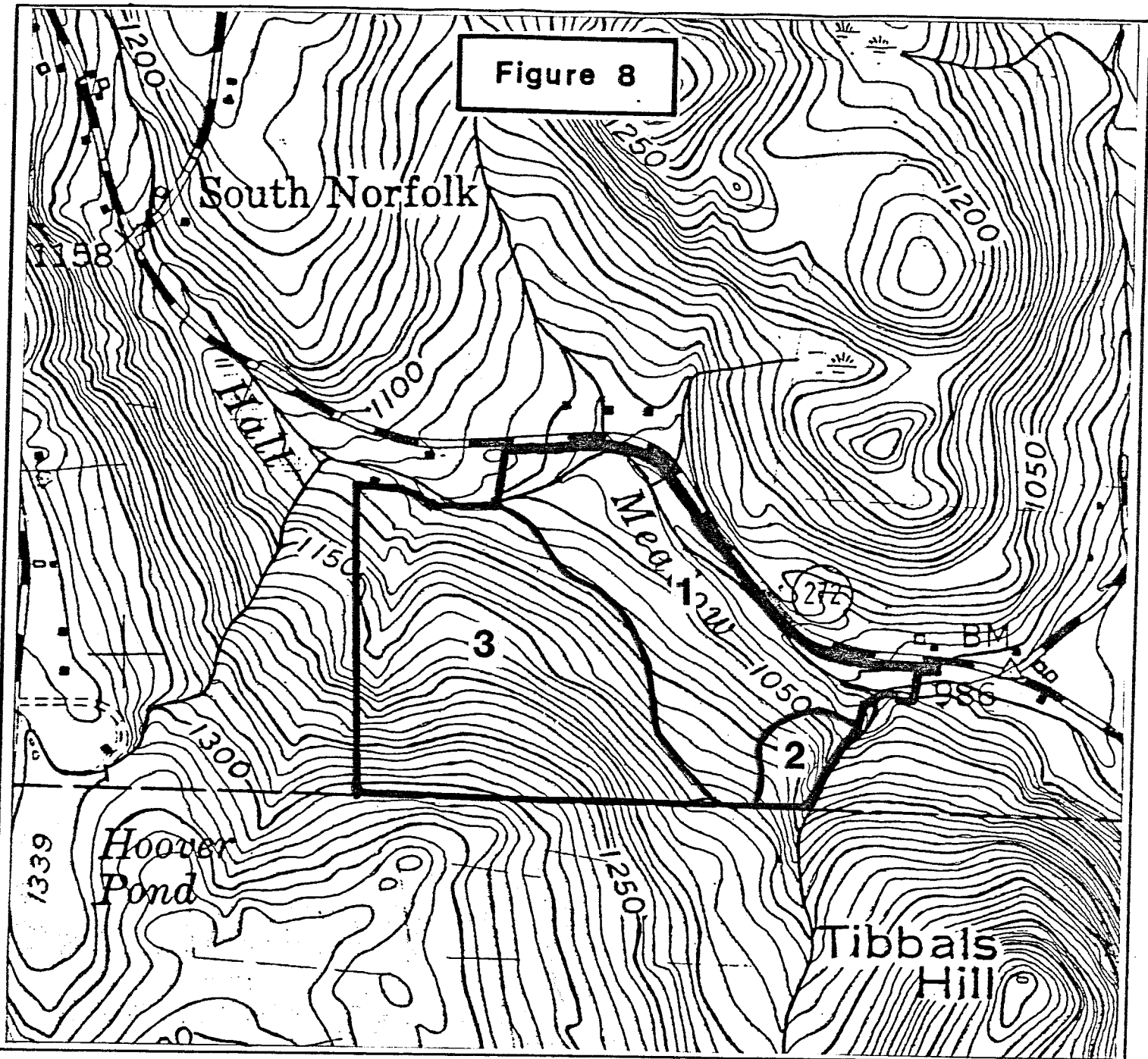
Vegetative Type Descriptions

Area #1 is closest to Route 272 and is dominated by hemlock and sugar maple. Other species occurring are ash and red maple. Most of the hemlock is 2 to 10 inches dbh, while some of the maple is 16 to 18 inches dbh. Much of this area is damp with a high water table. There are several areas where trees have been uprooted, and the resulting openings in the forest canopy have allowed new growth to occur. Tree growth in these areas tends to be birch or aspen associated with blue beech and brambles. The dampness of much of this area is evident in these openings as sensitive fern, false hellebore and trout lily are abundant. Along the brook there are a few flat areas of wetlands that contain thickets of blue beech and alder.

Area #2 lies on the southern tip of the property. Primary species in this area include the maples, yellow birch and ash. Judging from the size of the hardwood stump sprouts that dominate the stand, this area was clearcut 15 to 20 years ago perhaps with the idea of growing Christmas trees. There are two patches of spruce within this area.

Area #3 is dominated by sugar maple, black cherry, ash and beech. The beech becomes more dominant as one goes up the hill (to the west). This is an excellent site for growing trees. The recent timber sale left a well stocked

Figure 8



SEE TEXT FOR DESCRIPTIONS

**BARKER'S CROSSING
SUBDIVISION**

NORFOLK, CONNECTICUT

**FOREST
STANDS**

King's Mark Environmental Review Team

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if possible. The vegetation growing on these soils is, as a whole, more sensitive to disturbance than vegetation growing elsewhere. Shallow root penetration is evident in Area #1 where there have been patches of hemlock uprooted.

Alterations in the wetlands which permanently raise or lower the water and/or restrict natural drainage may have a negative impact on the vegetation in the immediate area. Raising the water table may drown root systems causing widespread mortality in the plant community. These types of situations may occur when crossing wet areas with roadways, driveways, etc., or diverting natural drainage around house sites. Care should be taken in the placement of any culverts in wet areas to avoid alteration of the water table.

Any cutting which takes place in the development of this parcel, whether it is for roadways or actual lots, should be done to take advantage of the demand for all wood products. Sawlogs and fuelwood would be the main products from this area. The marketing of these products should be a concern and should be planned. A public service forester or a private forester may be of assistance in either on-the-ground planning or the marketing of the wood products.

FISHERY RESOURCES

Site Description

The proposed Barker's Crossing Subdivision will incorporate Hall Meadow Brook and related wetland as its easterly border. Hall Meadow Brook is classified by the Department of Environmental Protection as Class AA/A surface waters. Designated uses for this classification are: potential drinking water source, fish and wildlife habitat, recreational use, agricultural and industrial supply and other legitimate uses.

Hall Meadow Brook flows through an extensive hardwood wetland area within the proposed development area. The stream averages approximately 20 feet in width and 1 to 4 feet in depth. The stream channel is characterized by shallow riffle and shallow to deep moving pool over a substrate of small boulder, cobble, gravel, coarse sand and sand/silt fines. Instream fisheries habitat is composed of random boulders, fallen and overhanging vegetation, undercut banks and depths afforded by pools. The riparian vegetation provides the stream cooling summertime shade and streambank stabilization.

Aquatic Resources

The Bureau of Fisheries stocks Hall Meadow Brook with brook trout upstream of the proposed development site and with brook, brown and rainbow trout in areas downstream. The section of stream, as well as two tributary streams involved with the proposed development, were sampled by backpack electroshocker on 5/16/88, to determine the resident fishery population. The stream was found to support a fishery resource composed of wild brook trout (Salvelinus fontinalis), slimy sculpin (Cottus cognatus), blacknose dace (Rhinichthys atratulus), longnose dace (Rhinichthys cataractae) and creek chub (Semotilus atromaculatus).

The fishery resource of the Hall Meadow Brook and tributaries were unique in that:

- 1) Three distinct age classes of wild brook trout were captured (young-of-the-year, yearling and adult) and in large numbers.
- 2) The presence of slimy sculpin, reported to be a rare species in Connecticut by the Natural Resources Unit of the Department of Environmental Protection, was found to be numerous within this stream system.

Impacts

The following potential impacts on Hall Meadow Brook can be expected to occur if proper mitigative measures are not taken.

Roadway Crossings: The planned use of twin box culverts at the two proposed crossings will be the greatest cause of damage to the stream environment. During construction there will be a complete destruction of localized in-stream aquatic habitats, and the proposed blockage of the stream and rerouting of the stream channel will result in the degradation of downstream habitats. The implaced culverts will not only eliminate in-stream habitats but may serve as points of impass for fish migration.

Subdivision Development: During construction, soil erosion and sedimentation of watercourses will occur through increased surface runoff from unvegetated zones. Research has shown this is the major cause of stream degradation. Road salts, sands and oils may be introduced to the watercourses. Surface drainage from roads and driveways may allow these pollutants to enter Hall Meadow Brook. This will result in water quality and stream habitat degradation. Transport of lawn fertilizers, chemicals and septic tank leachate to the watercourse may stimulate excessive aquatic plant growth and result in water quality degradation and the potential for "fish kills." Any water quality problems and habitat degradation within this area of Hall Meadow Brook due to increased sedimentation, road and stormwater drainage and non-point nutrient inputs will eventually be observed in downstream areas.

Recommendations

Hall Meadow Brook contains a unique fishery resource which, due to the impacts of increased development, has become extremely rare to Connecticut. As such the Town of Norfolk should take into consideration the following recommendations to protect Hall Meadow Brook from the impacts associated with this development.

- 1) The activities involved with the implacement of the twin box culverts at the two roadway crossings will have the greatest and the longest lasting impacts to the delicate habitats and rare fishery resource of

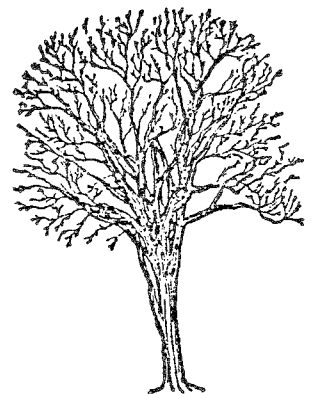
Hall Meadow Brook. The culvert placement will cause not only loss of habitat but, through degrading the existing habitat quality, may completely eliminate the existing fishery. Once eliminated this resource will never be replaced. To minimize direct impacts to the stream, the roadway crossings should be by clear-span bridge. The site characteristics do not eliminate bridges as a viable alternative.

- 2) From the sampling carried out, it appears that the tributary streams serve as a spawning and nursery area for both the brook trout and sculpin. Development within the immediate area of the two tributary streams should be discouraged.
- 3) Maintain a 100 foot (minimum) open space buffer zone along the edge of Hall Meadow Brook. No construction or alteration of riparian habitat should take place within this zone. The buffer zone could be widened in areas of steeper terrain.
- 4) A comprehensive erosion and sedimentation control plan should be submitted and installed prior to the start of construction and maintained through all construction phases. Mitigative measures should include, but not be limited to, detention basins, catch basins, silt fences and hay bales. Surface runoff during and following construction must not be allowed to directly enter Hall Meadow Brook either as overland flow or by directing drainage systems into the stream. Once construction is initiated, officials from the Town of Norfolk should regularly police this development to ensure that all erosion and sedimentation controls are properly implaced and are being regularly maintained.
- 5) An effective stormwater management plan should be designed and implemented. Stormwater runoff from houselots and roadways should not directly enter Hall Meadow Brook. Detention basin(s) should be designed and installed to collect the runoff prior to any releases to the brook.
- 6) Limit liming, fertilizing and the introduction of chemicals to subdivision lawns close to the brook. Impress upon the homeowners the importance of properly maintaining septic systems. This will help abate the amount of additional nutrients to Hall Meadow Brook.
- 7) Educate the homeowners to develop water conservation measures for groundwater consumption throughout the year. This is especially critical during extended low precipitation periods to prevent excessive withdrawals upon the aquifer which also supplies flows to Hall Meadow Brook.

THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

According to the DEP - Natural Diversity Database there are no Federally listed Endangered Species that occur within the study area. A Connecticut "Species of Special Concern", the slimy sculpin (Cottus cognatus), was located in the study area during the review (see Fishery Resources section). The Natural Diversity Database contains the most current biological data concerning endangered or threatened plant or animal species. On-going research continues to locate additional populations of species or locations of habitats of concern as well as existing data.

**LAND USE AND PLANNING
CONSIDERATIONS**



sawmill operator's knowledge, no existing resident in the area has ever complained about noise generated on the site. There is no record of a complaint having been filed with the DEP's Noise Control Unit.

According to Norfolk's First Selectman, there are presently no regulations in town to control noise. Hence, the Planning and Zoning Commission is encouraged to address this potential area of conflict with the applicant and sawmill operator. The Commission is encouraged to: 1) discuss the issue with the staff of DEP's noise control unit (contact Joseph Pulaski at 566-7494); 2) encourage the sawmill operator to request DEP monitoring of the noise level generated by the sawmill during operation and compare the results with the noise standards established by DEP; 3) discuss with the applicant, sawmill operator and DEP the need for any noise mitigating measures on site such as baffles or other means of soundproofing; and 4) require notification of prospective residents of the subdivision of the existence and current hours of operation of the sawmill via a note on the official subdivision map and/or property deed.

Consistency of Project with State, Regional and Local Plans

The State Policies Plan for the Conservation and Development of Connecticut, 1987-1982 is a statement of the growth, resource management and public investment policies of the State. The Plan was prepared by the Office of Policy and Management and adopted by the Connecticut General Assembly in 1987. The objective of the Plan is to give a balanced response to human, environmental and economic needs in a manner which best suits the future of Connecticut. Regional planning organizations in the State have been encouraged by OPM to foster implementation of the Plan at the local level.

According to the Locational Guide Map which accompanies the State Plan, the majority of the subject site has been classified as "rural land." The State action strategy for rural land is "Avoiding support of structural development forms and intensities which exceed on-site carrying capacity for water supply and sewage disposal on a permanent basis, which are inconsistent with open rural character or conservation values of adjacent areas and which are more appropriately located in Rural Community Centers." The large wetland area associated with Hall Meadow Brook is classified as a preservation area according to the State Plan. The State action strategy for preservation areas is to "foster the identification of significant resource areas of statewide significance and advocate their protection by public and quasi-public agencies in their planning and investment decisions." The proposed project appears to be consistent with the goals and objectives articulated in the State Plan for this area of Norfolk.

The Litchfield Hills Council of Elected Officials is the official regional planning organization for the Litchfield Hills Region which includes the Town of Norfolk. The LHCEO is considering the adoption of a preliminary housing policy which, among other objectives, promotes the provision of open space with residential development and supports housing development that accommodates natural environmental limitations. The proposed project reflects both of these objectives and is thus judged to be compatible with the preliminary housing policy being considered by the LHCEO, provided environmentally sound engineering and construction practices are followed during project implementation.

The Town of Norfolk is in the process of updating its Town Plan Development. The proposed project is consistent with the comprehensive plan of the Town as expressed through its zoning regulations.

To conclude, the proposed project appears to be consistent with State, regional and local plans and policies.

Design Considerations

Based on a preliminary review of the proposed plot plan for Barker's Crossing dated 4/25/1988, the following comments on subdivision design are offered for consideration:

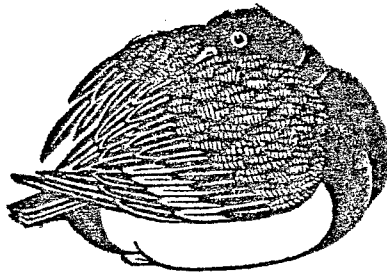
- 1) The sight line distances where the proposed Brook Hill Road intersects with Route 272 should be documented by the applicant to ensure that the distances are adequate for safe access to and from the site.
- 2) Due to the steep grades and length of the proposed right of ways servicing Lots 30 and 31, consideration should be given to combining these lots with other proposed lots and/or providing access off Brook Hill Road to these two lots. This second alternative would require additional re-design of the project to accommodate Norfolk's subdivision requirement of no more than 10 lots on a dead end road.
- 3) For those interior lots where driveways will have a grade in excess of 15%, the Commission should require a driveway drainage plan prepared by a professional engineer as specified by section 7.14.4 of Norfolk's zoning regulations.
- 4) Protection of the Hall Meadow Brook streambelt through the use of a conservation easement as planned is a proven and environmentally sound land use planning technique.

TRAFFIC CONSIDERATIONS

- 1) The desirable sight lines required by the running speeds on Route 272 in the vicinity of the proposed drives are 770 feet to both the north and south out of both drives. The preferred setback is 20 feet. These distances should be provided by the owner of the development.
- 2) The turning radii into each proposed drive should be sufficient to accommodate the turning movement of a moving SU-30 design vehicle without encroachment of either the Route 272 or the drive center lines.
- 3) The turning radii out of each proposed drive should be sufficient to accommodate the turning movement of a stopped SU-30 design vehicle without encroachment of either the drive or the Route 272 center lines.
- 4) It is recommended that stop signs and painted stop bars be installed at the end of both drives at their intersections with Route 272.

- 5) Adequate width on the Route 272 southbound approaches to each proposed drive, to allow through traffic to bypass vehicles turning left into the drives, would be desirable. Twenty-two feet from center line to edge of pavement is suggested.
- 6) In order to conform to AASHTO Guidelines, the profiles for the proposed drives should have a maximum slope of 3% for 50 feet from the edge of Route 272 and then a maximum grade of 8% beyond that. The plans show grades upwards to 12%.
- 7) No driveways serving individual home sites should be permitted to have direct access to Route 272, if the efficiency of Route 272 is to be maintained.
- 8) Prior to any work within the state highway right-of-way, issuance of a permit from the District IV Office of Permits, New Milford, will be necessary.

APPENDICES



Appendix A: Soil Limitations Chart

MAP UNIT NAME *	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	MAJOR LIMITATIONS TO THE DEVELOPMENT OF:			
			HOMES WITH BASEMENTS	HOMES WITHOUT BASEMENTS	SEPTIC SYSTEMS	ROADS AND STREETS
Am - Fluvaquents-Udifluvents Complex, 0-3% slopes	Highly variable alluvial soils formed in loamy to sandy and gravelly materials	Very poorly drained to well drained 0-2.5 ft.	Flooding, wetness	Flooding, wetness	Flooding, wetness	Flooding, wetness
ChB - Charlton very stony fine sandy loam, 3-8% slopes	Glacial till soils formed in loose loamy materials	Well drained > 3.0 ft.	None	None	None	None
ChC - Charlton very stony fine sandy loam, 8-15% slopes	Glacial till soils formed in loose loamy materials	Well drained > 3.0 ft.	None	None	None	Slope
CrD - Charlton extremely stony fine sandy loam, 15-25% slopes	Glacial till soils formed in loose loamy materials	Well drained > 3.0 ft.	Slope	Slope	Slope	Slope
CrE - Charlton extremely stony fine sandy loam, 25-45% slopes	Glacial till soils formed in loose loamy materials	Well drained > 3.0 ft.	Slope	Slope	Slope	Slope
Le - Leicester very stony fine sandy loam, 0-8% slopes	Glacial till soils formed in loose loamy materials	Poorly drained 0.5-1.5 ft.	Wetness	Wetness	Wetness	Wetness, subject to frost action
PeC - Paxton very stony loam, 8-15% slopes	Glacial till soils formed in dense loamy materials	Well drained 1.5-2.5 ft.	Seasonal wetness	None	Substratum percs slowly	Slope
Po - Pootatuck fine sandy loam, 0-2% slopes	Alluvial soils formed in loamy over sandy and gravelly materials	Moderately well drained 1.5-2.5 ft.	Flooding, wetness	Flooding	Flooding, wetness	Flooding

MAP UNIT NAME *	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	MAJOR LIMITATIONS TO THE DEVELOPMENT OF:		
			HOMES WITH BASEMENTS	HOMES WITHOUT BASEMENTS	ROADS AND STREETS
Rg - Ridgebury very stony fine sandy loam, 2-8% slopes	Glacial till soils formed in loose loamy materials	Poorly drained 0.5-1.5 ft.	Wetness	Wetness, substratum percs slowly	Wetness, subject to frost action
SxB - Sutton very stony fine sandy loam, 2-8% slopes	Glacial till soils formed in loose loamy materials	Moderately well drained 1.5-2.5 ft.	Seasonal wetness	None	Subject to frost action
SxC - Sutton very stony fine sandy loam, 8-15% slopes	Glacial till soils formed in loose loamy materials	Moderately well drained 1.5-2.5 ft.	Seasonal wetness	None	Subject to frost action, slope
WyB - Woodbridge very stony loam, 2-8% slopes	Glacial till soils formed in dense loamy materials	Moderately well drained 1.5-2.5 ft.	Seasonal wetness	None	Subject to frost action
WYC - Woodbridge very stony loam, 8-15% slopes	Glacial till soils formed in dense loamy materials	Moderately well drained 1.5-2.5 ft.	Seasonal wetness	None	Subject to frost action, slope

* Many of the map unit names and symbols used in this report are unique and may differ from the Litchfield County Soil Survey Report, 1970 legend and text.

NOTES

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, soil scientists, foresters, climatologists, landscape architects, recreational 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 83 town area serving western Connecticut.

As a public service activity, the Team is available to serve towns and/or developers within the King's Mark RC & D Area - free of charge.

PURPOSE OF THE ENVIRONMENTAL REVIEW TEAM

The Environmental Review Team is available to assist towns and/or developers in the review of sites proposed for major land use activities. For example, the ERT has been involved in the review of a wide range of significant land use activities including subdivisions, sanitary landfills, commercial and industrial developments, and recreational/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 site, and highlighting opportunities and limitations for the proposed land use.

REQUESTING AN ENVIRONMENTAL REVIEW

Environmental Reviews may be requested by the chief elected official of a municipality, or the chairman of an administrative agency such as planning and zoning, conservation, or inland wetlands. Environmental Review Request Forms are available at your local Soil and Water Conservation District, and the King's Mark ERT Coordinator. This request form 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 investigate. When this request is approved by the local Soil and Water Conservation District and King's Mark RC & D Executive Committee, the Team will undertake the review. At present, the ERT can undertake two (2) reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil and Water Conservation District or Nancy Ferlow, ERT Coordinator, King's Mark Environmental Review Team, King's Mark Resource Conservation and Development Area, 322 North Main Street, Wallingford, Connecticut 06492. King's Mark ERT phone number is 265-6695.