Environmental Review Team Report

McGUIRE SUBDIVISION

STONINGTON, CONNECTICUT

R C & D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

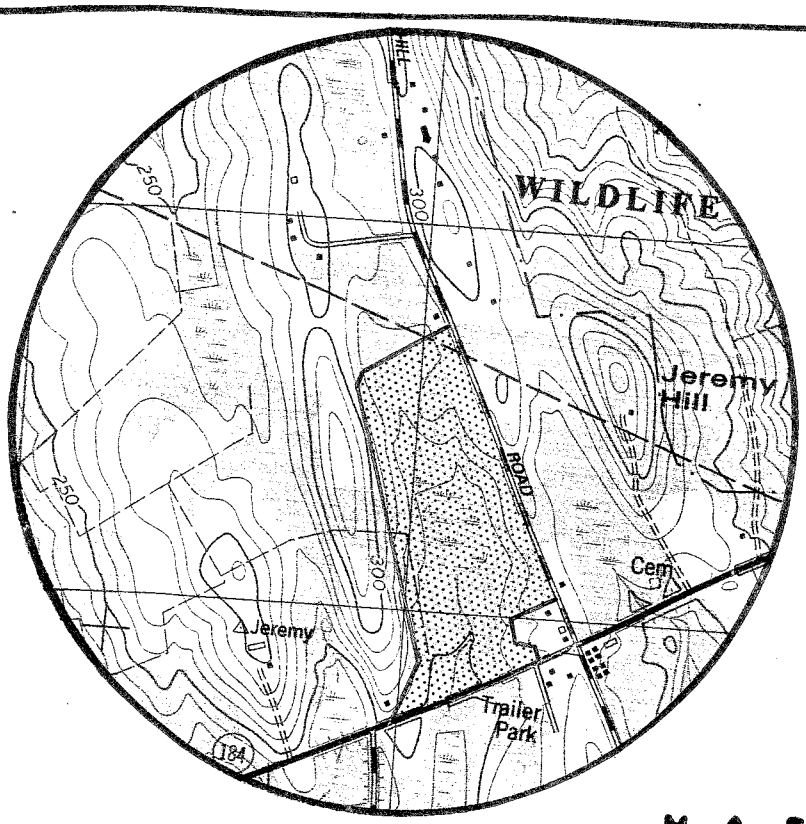
Environmental Review Team Report

McGUIRE SUBDIVISION

STONINGTON, CONNECTICUT

AUGUST
1985

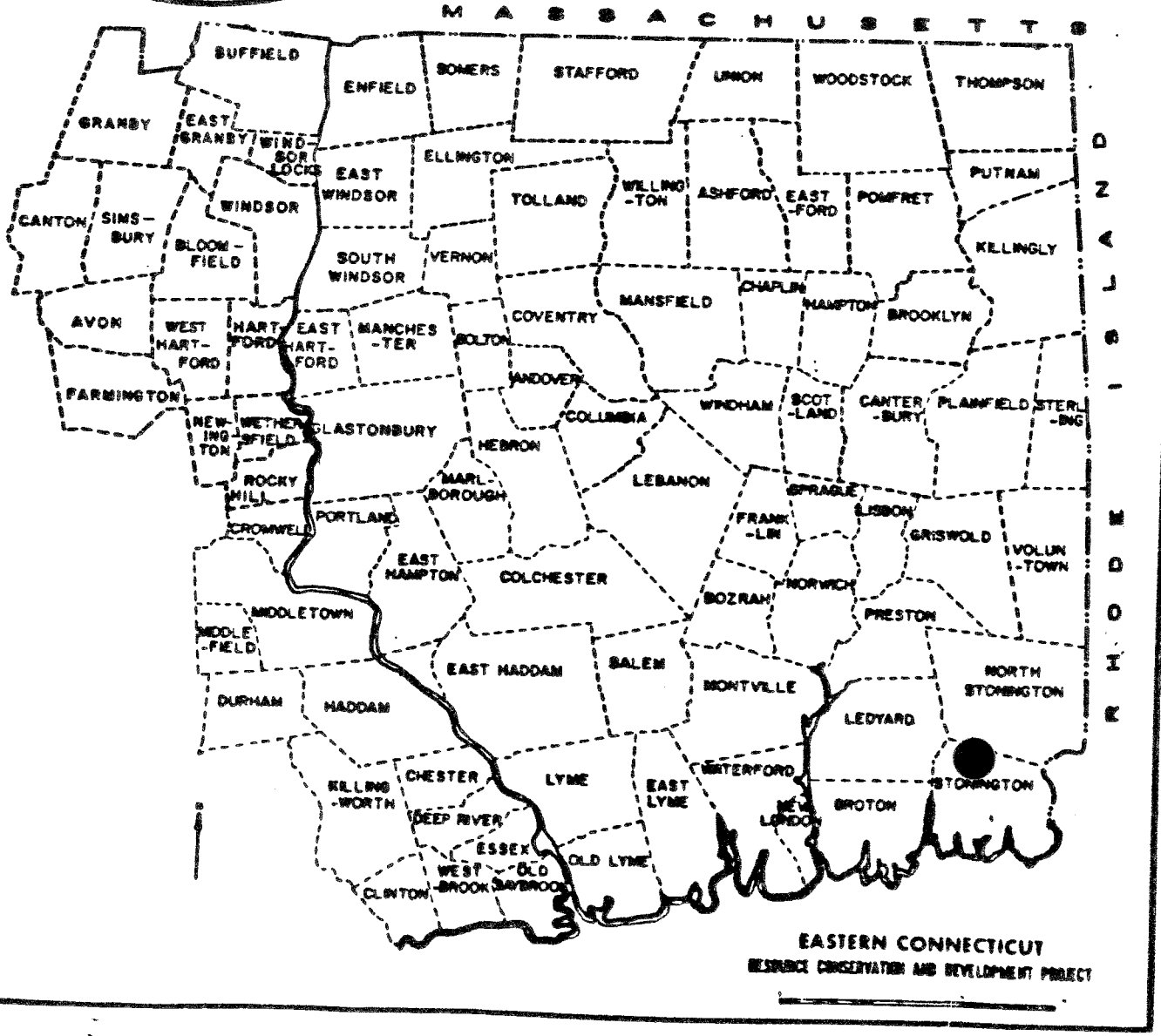
Eastern Connecticut Resource Conservation & Development Area
Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234



Location of Study Site

MCGUIRE SUBDIVISION

STONINGTON, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT
ON
THE McGUIRE SUBDIVISION
STONINGTON, CONNECTICUT

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

The ERT met and field checked the site on Thursday, June 27, 1985. Team members participating on this review included:

Donald Capellaro	- Sanitarian - CT Department of Health
Barry Cavanna	- District Conservationist - U.S.D.A., Soil Conservation Service
Pete Merrill	- Forester - Department of Environmental Protection
Carol Sacknoff	- Wildlife Bureau - Department of Environmental Protection
Charles Storrow	- Regional Planner - Southeastern CT Regional Planning Agency
Bill Warzecha	- Geologist - DEP, Natural Resources Center
Judy Wilson	- Wildlife Biologist - Department of Environmental Protection

Prior to the review day, each team member received a summary of the proposed project, a list of the Town's concerns, a soils map and a location map indicating lot lines. During the field review the team members were given site plans and a topographic map. The Team met with and were accompanied by the developer, the engineer and the surveyor for the subdivision. Following the review, reports from each team member were submitted to the ERT Coordinator for compilation and editing into this final report.

The report represents the Team's findings. It is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project--all final decisions and conclusions rest with the Town and landowner. This report identifies the existing resource base and evaluates its significance to the proposed development, and also suggests considerations that should be of concern to the developer and the Town. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions on this project.

If you require any additional information, please contact: Ms. Elaine A. Sych, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Route 205, Brooklyn, CT 06234, 774-1253.

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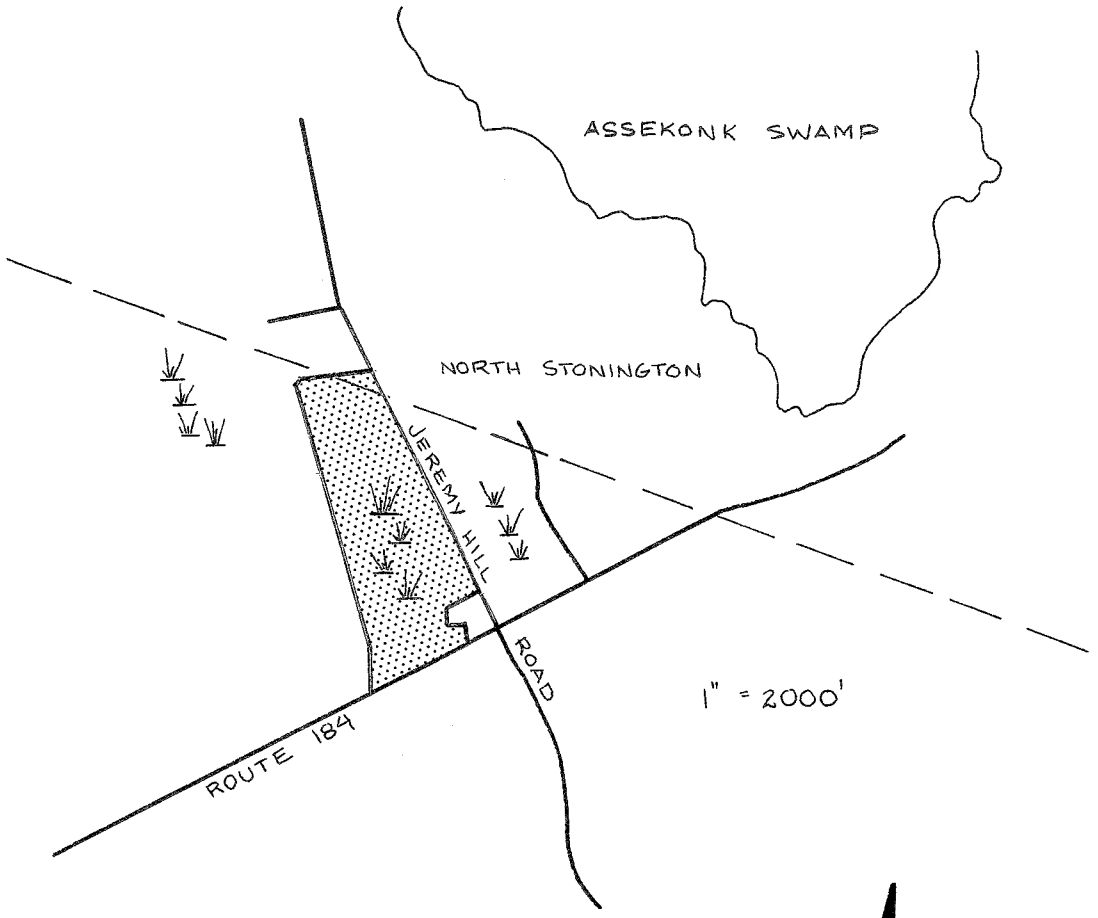
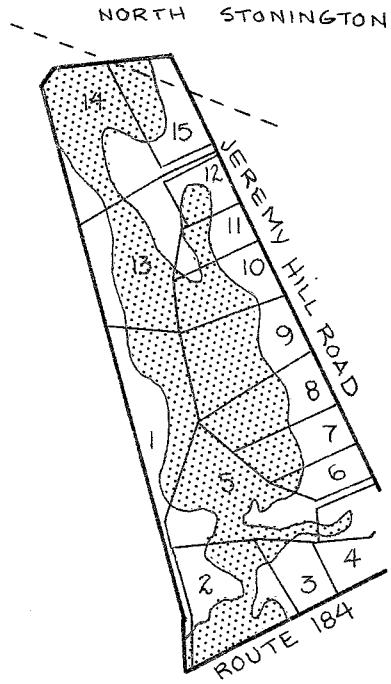




APPROXIMATE WETLANDS

1" = 1000'

I. INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a proposed subdivision in the town of Stonington. The project site is located almost entirely in the town of Stonington along the northwest side of the intersections of Route 184 and Jeremy Hill Road. A small northeast corner of the subdivision extends into the town of North Stonington. The acreage excludes a corner property and dwelling which is under different ownership and an adjoining lot and house on Jeremy Hill Road.

The proposed subdivision is about 65 acres in size and will contain 15 lots ranging in size from 1.84 acres to 7.3 acres. Access to the sites will be off of Route 184 and Jeremy Hill Road. The parcel is located in an 80,000 square foot lot zone.

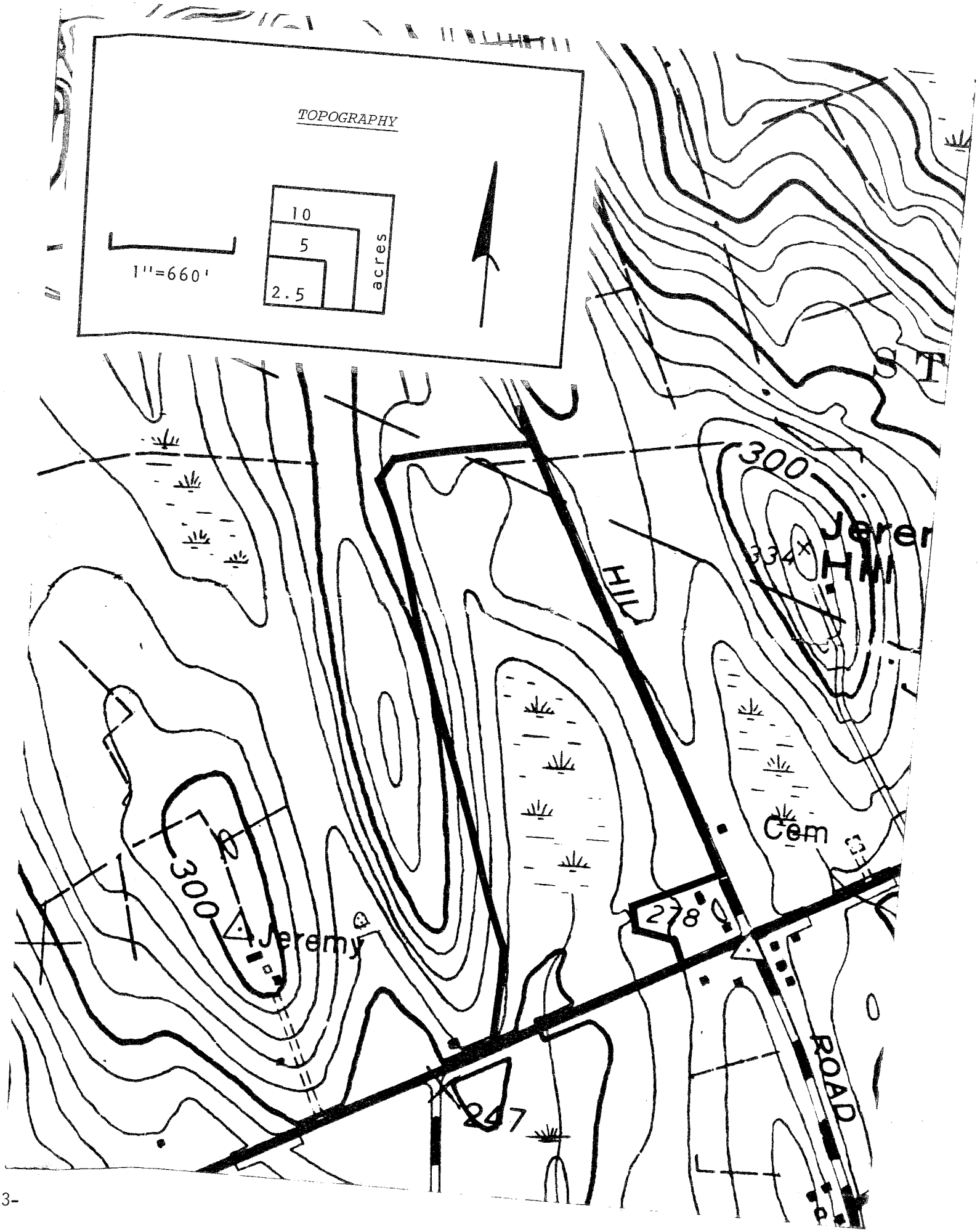
The major features of the parcel are the extensive wetlands which extend through the property, and the defined watercourse which flows from the property under Route 184 near the southeast corner. The small unnamed stream joins Wheeler Brook about a mile south of the parcel. The land consists of open farm fields and wooded acreage. Property located opposite the proposed subdivision on the east side of Jeremy Hill Road has recently been subdivided and a number of new houses have been built.

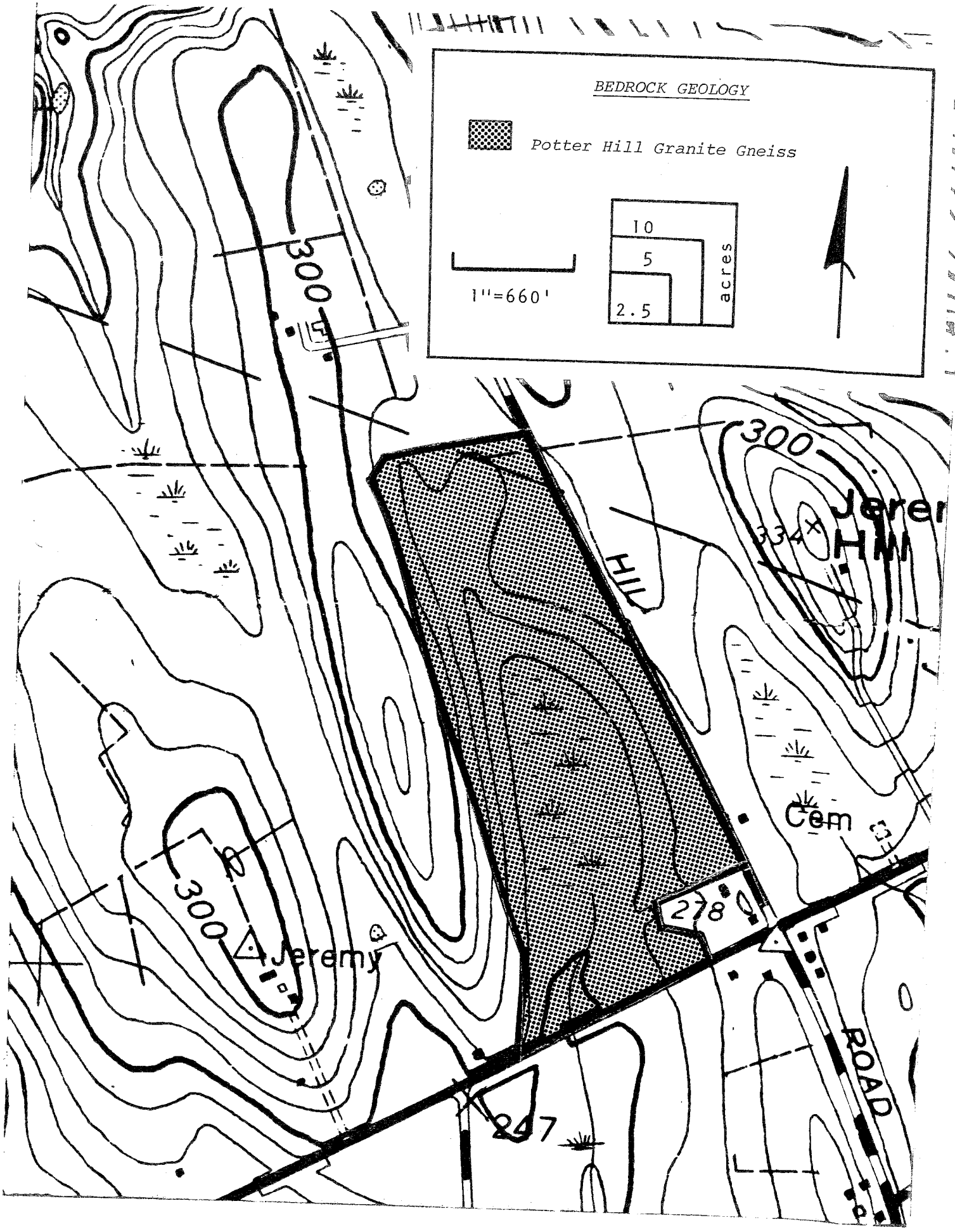
The property is being developed by Stephen McGuire. Preliminary plans have been prepared by Reese Roberts, and the engineer is George Smilas. The overall density of this subdivision has been reduced from the initial concept of 20 lots to 15. These 15 single family dwellings will be served by on-site wells and on-site septic systems.

The Town is concerned with the effect that the proposed subdivision will have on the natural resource base of the site and the surrounding area. The ERT was asked to deal specifically with the impact development will have on the wetlands and drainage patterns, and how the high water table affects building suitability, water supply and quality, and sewage disposal.

II. TOPOGRAPHY AND GEOLOGY

The proposed 15 lot subidvision is about 65 acres in size and is almost entirely located in the town of Stonington at the corner of Route 184 and Jeremy Hill Road. A small northeast corner of lot #15 is located in the town of North Stonington. Access to the sites will be off the roads mentioned above. Land throughout much of the property slopes gently


TOPOGRAPHY
1"=660'
10
5
2.5
acres
300
334
Jerer
HM
HIL
ST
Cem
278
300
Jeremy
207
ROAD


BEDROCK GEOLOGY
Potter Hill Granite Gneiss
1"=660'
10
5
2.5
acres
300
300
300
334
HW
Cem
278
247
ROAD
Jeremy
HILL

toward the wetland area traversing the central parts. A small unnamed streamcourse originates from the wetlands on the site. This stream ultimately empties into Wheeler Brook just over a mile south of the site.

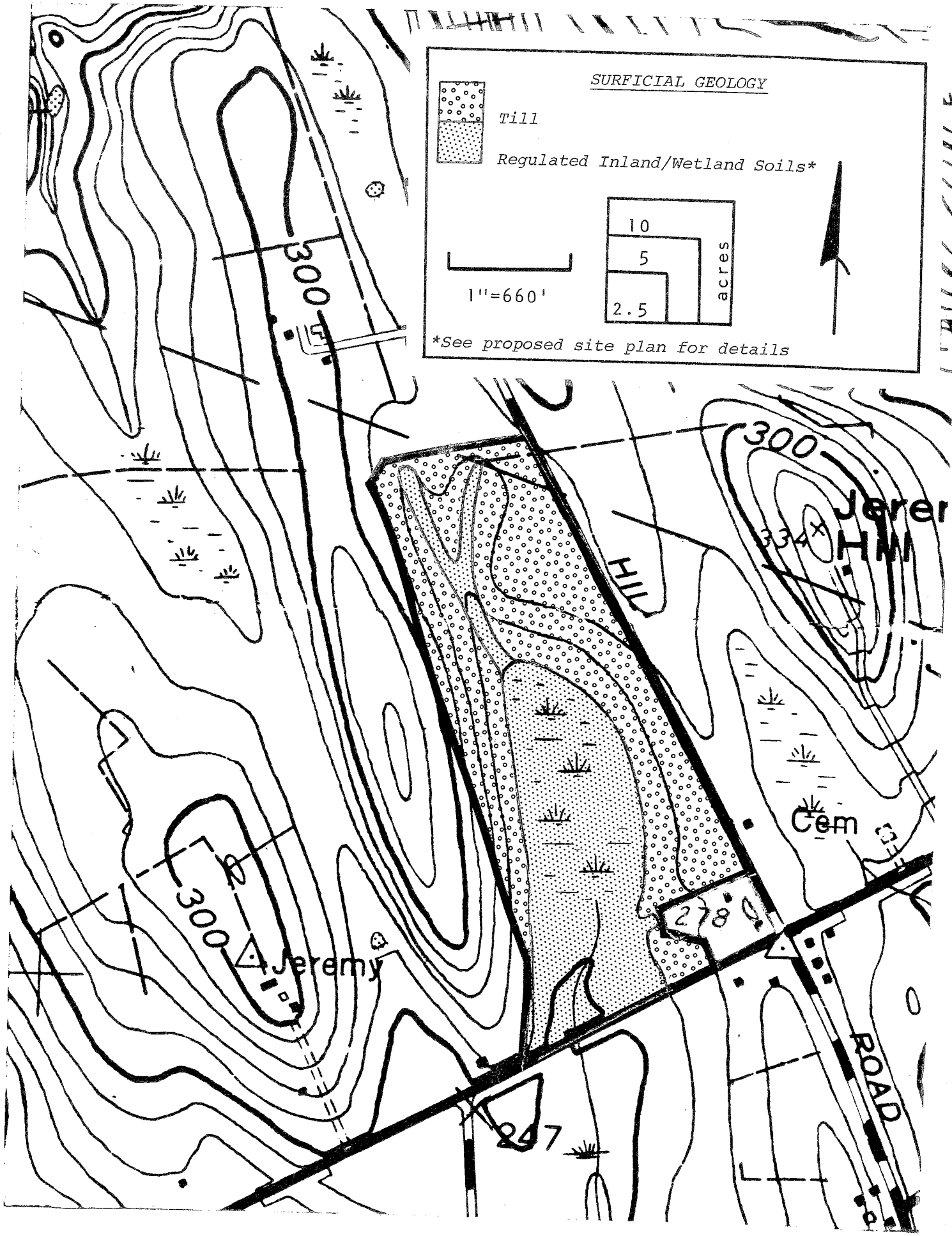
Elevations on the site range from a high of about 290 feet above mean sea level at the eastern, western, and northern boundary lines to a low of about 250 feet above mean sea level where the unnamed streams leaves the property near Route 184 in the southern parts.

The parcel is located within the Old Mystic topographic quadrangle. A bedrock geologic map (Map I-1524, by Richard Goldsmith) for the Old Mystic quadrangle, has been recently published by the U.S. Geologic Survey. The surficial geologic map for the quadrangle has not been published to date. Nevertheless, the Team's geologist was able to reference the Soil Conservation Service's "Soil Survey for New London County" as well as soil data obtained from deep test pits excavated on the site for this part of the report.

No bedrock exposures (ledgerock) were visible on the site during the field inspection nor was it encountered in any of the deep test pits excavated on the site. The depth of deep test pits ranged from 78 inches (6.5 feet) to 92 inches (about 8 feet). The exact depth to bedrock throughout the parcel is unknown. However, it is probably at least 10 feet in most places. The underlying bedrock should pose no major problems in terms of the proposed subdivision. However, it should be pointed out that the developer stated on the review day each of the proposed building lots will be served by bedrock wells. As a result, the underlying bedrock may affect water quality and quantity of water withdrawn from any bedrock wells drilled in the subdivision. This will be discussed in detail in the Water Supply Section of this report.

According to Map I-1524, bedrock underlying the site is classified as Potter Hill Granite Gneiss. These rocks are described by Goldsmith as gray to pinkish-gray granitic gneiss composed of the minerals quartz, feldspar, and biotite with minor amounts of magnetite, muscovite, and apatite. The term "gneiss" refers to a crystalline, metamorphic (process by which rocks are geologically altered by great heat and pressures within the earth's crust) rock. Gneisses are characterized by alternating layers of platy or flaky minerals and more rounded minerals. This material arrangement gives the rocks a distinct banded appearance.

Overlying bedrock throughout the site is a blanket of glacial sediment called till. This material consists of a nonsorted, nonstratified mixture of rock particles of widely varying shapes and sizes. It was deposited directly from glacier ice without substantial reworking by meltwater streams. Based on soil mapping information supplied to Team members, most of the till on the site appears to be a variety which is sandy with some silt in the upper two to three feet. At depth 18"-30", however, the till becomes more silty and more firm. This firmer layer tends to impede groundwater percolating downward through the soil resulting in a high water table during the wet times of the year. According to the soils map, there are


SURFICIAL GEOLOGY
Till
Regulated Inland/Wetland Soils*
1"=660'
10
5
2.5
acres
*See proposed site plan for details
300
300
300
Jerer
HM
334
HILL
Cem
278
Jeremy
ROAD
207

patches of areas within the site which contain soils types that may not have the compact layer at depth. These soils are delineated by the symbol CcB (Canton and Charlton soils) on the soils map.

Seasonally wet areas, comprised of regulated inland-wetland soils generally parallel the small streamcourse in the central parts. These soils types are delineated as Rn (Ridgebury, Leicester and Whitman soils) and Rd (Ridgebury soils) on the accompanying soils map. Because of wetness, these areas hold very low potential for both development and on-site septic systems.

III. GEOLOGIC DEVELOPMENT CONCERNS

In terms of the proposed subdivision development, the major geologic limitations found on the site includes: (1) areas of seasonal wetness (delineated as Rn and Rd on the soils map), and (2) the compact nature of most of the till soils on the site, which commonly results in seasonally high water tables. The presence of numerous surface boulders may also be a nuisance for excavation and landscaping.

These geologic limitations will weigh most heavily on the ability to provide adequate subsurface sewage disposal systems serving each of the 15 homes in the subdivision, since public proposed sewers are not available. In many cases, proper planning and engineering can overcome the above limitations particularly the second. The applicant (Mr. McGuire) indicated on the review day that all septic systems serving houses in the proposed subdivision will be specially designed by an engineer, and that regulated inland-wetland soils will not be disturbed except in few areas for the construction of access drives.

Certain Team members discussed with the applicant and project engineer possible layouts for house, septic system, and well primarily for lots #6-12 and #15 along Jeremy Hill Road. One possible arrangement would be to locate septic systems, houses, and wells in a straight line parallel to Jeremy Hill Road and to alternate the locations of septic systems and wells on each lot. This arrangement would be compatible with the topographic conditions and wetlands in this part of the subdivision. For example, the layout for this part of the subdivision might be septic system, house, and well on one lot, then well, house, and septic system on the next lot, etc. continuing down the road.

Based on the site plan made available to Team members, there appears to be suitable area on each lot to construct a house and install a septic system and well. It should be pointed out that design criteria for septic systems constructed on compact till soils may include the installation of a curtain drain in order to intercept groundwater moving towards a particular septic system. Based on the arrangement mentioned in the last paragraph, it may be possible to connect house footing drains with a curtain

drain. Many of the lots appear to have sufficient gradient for footing drain and curtain drain discharge lines.

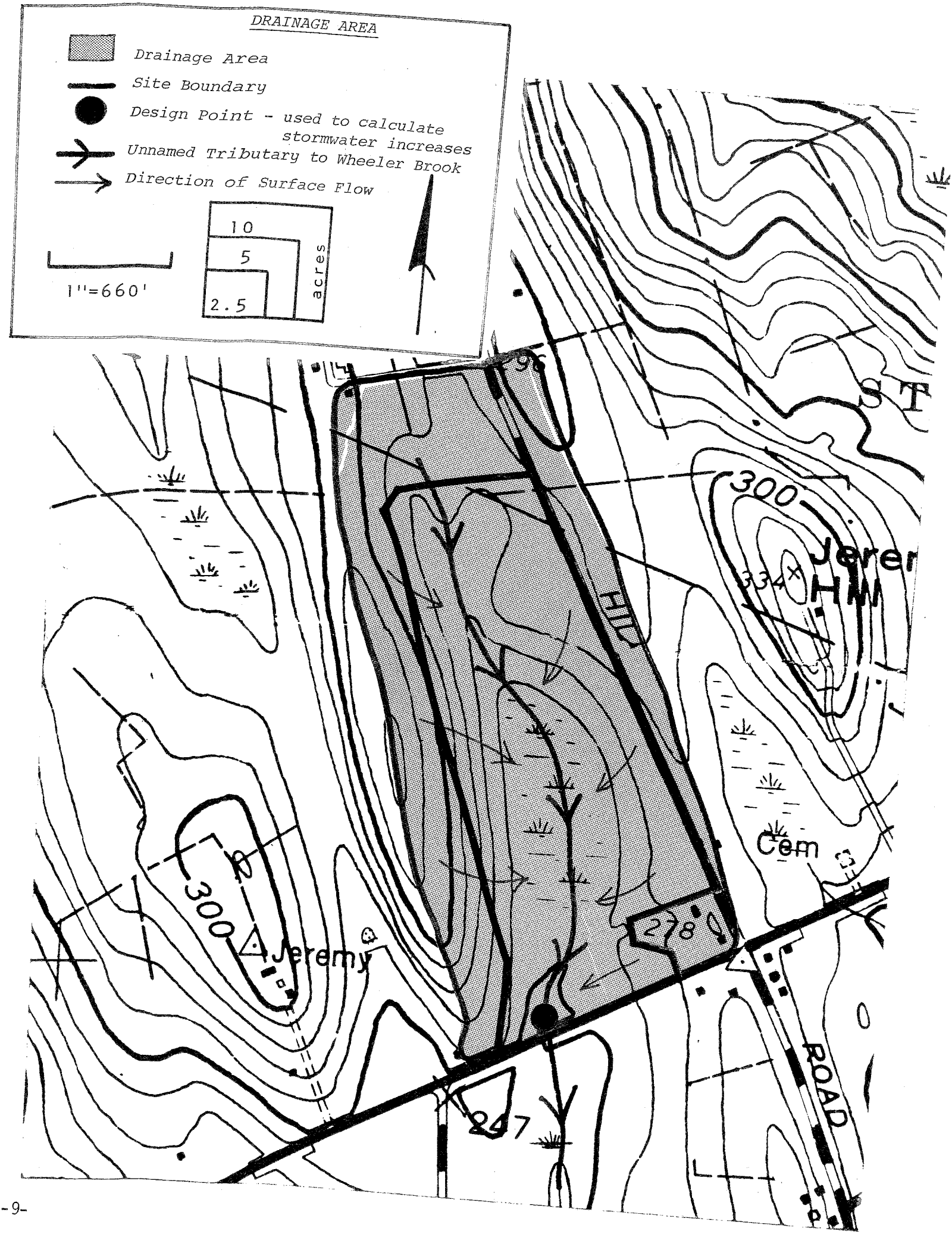
House footing drains should be considered due to the presence of a seasonally high water table. The installation of house footing drains would hopefully keep basements dry. However, the installation of a curtain drain(s), and house footing drains, particularly on lots with limited developable areas, may make the installation of a septic system problematic because of separating distances required by the State Public Health Code.

Once septic systems are engineered and approved by the proper authorities (i.e., local and state health department), it is important that the systems be installed properly in accordance to design specifications, the State Public Health Code and any local ordinances, if applicable. If there is a particularly difficult lot in terms of subsurface sewage disposal, the Town may consider requiring the applicant's engineer to supervise the installation of that septic system.

As mentioned earlier, regulated wetland soils on the site will not be disturbed except for driveway crossings. According to the site plan, which includes the delineation of wetland boundaries by a certified soil scientist on the property, it appears that access to lot #1 and possible #2 and #13 will need to cross some of the wetland areas. Wetland crossings are generally feasible provided they are properly designed (e.g., culverts are properly sized and installed, permeable road base fill material is used). The roads 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 the year with adequate provisions for effective erosion and sediment control. Detailed plans for any proposed road crossings through wetlands should first be submitted to the proper Town authorities and commissions for their review, comment and final approval prior to beginning any construction.

IV. HYDROLOGY

The proposed subdivision lies within the drainage area of an unnamed tributary to Wheeler Brook. Surface runoff and groundwater on the site flow generally downslope to the wetland areas in the central parts. Water is then transported via the unnamed stream bisecting the wetlands to Wheeler Brook. The streamcourse flows in a southerly direction through the site. The overall drainage area of the streamcourse, to the point at which it passes through the 36" reinforced concrete pipe under Route 184, is approximately 143 acres.


DRAINAGE AREA
Drainage Area
Site Boundary
Design Point - used to calculate stormwater increases
Unnamed Tributary to Wheeler Brook
Direction of Surface Flow
1"=660'
10
5
2.5
acres
300
Jeremy
Cem
ROAD
278
247
334
HM

Development of the site will lead to some increases in runoff. The amount of the increases will depend upon the extent of development, the amount of impervious surfaces created, and the amount of vegetation removed.

Peak flows for certain storm events (such as the 10 year, 25 year, 50 year, and 100 year storm) may be estimated by a method described in Technical Release No. 55 of the Soil Conservation Service. This method considers soil types, vegetative cover, land use, slopes, and other factors. In order to calculate runoff changes and peak flows, TR-55 requires the estimation of curve numbers, which relate amounts of precipitation to amounts of runoff. It should be noted that the rainfall figures used in the hydrologic calculations represent an amount that would occur within a 24 hour period. A higher curve number indicates that a greater volume of runoff would occur following a given amount of runoff.

Based on the proposed site plan and some assumptions made by the applicant regarding amounts of impervious surfaces to be created on each of the lots and general drainage information, it is estimated that development of the site would increase the curve number by less than 1 (from 69.5 to 69.6). Based on these estimates, the resultant peak flow increases to the unnamed stream should not have a significant effect on the wetlands and downstream areas. As a result, no harmful effects, such as flooding from these increases are anticipated. As a precautionary measure, however, the project engineer may want to check the 36" culvert passing under Route 184.

Some wetland areas have the ability to perform important positive hydrological functions such as: (1) serving as a flood and stormwater retention area, which reduces downstream flood flows during periods of heavy precipitation, (2) improving surface water quality through various biochemical processes, and (3) trapping sediments from upstream areas.

It appears that the wetland area on the site would be in a good hydrologic position for detaining the anticipated increases in stormwater runoff from the proposed subdivision. For this reason and the other reasons mentioned above, a decision to keep the wetlands on the site undisturbed would be advised.

V. WATER SUPPLY

Potable water for the proposed development would be provided by private on-site wells. In general, the level of building density (lots) would be low and wells would be spread out. As wells for single family dwellings do not need a large yield for normal domestic purposes, the minimum required separation distance of at least 75 feet from well site to sources of contamination or pollution is usually reflected when locating facilities. Certain soil conditions, however, can dictate the need for greater distances in order to further assure safe water quality. Along with consideration

of the terrain and geology, is the factor of proper well construction. Drilled wells will usually afford greater protection of a groundwater source and allows for more flexibility in placement. While it is not usually possible to predict accurately the yield of a given well, drilled wells in most cases are successful as to providing both an adequate yield and safe water.

Due to the lack of a suitable stratified drift (sand and gravel) aquifer on-site, which, depending upon certain hydrogeologic characteristics of a particular area may produce a high yielding well, it appears wells would have to tap the underlying bedrock aquifer. Wells drilled in bedrock generally supply small but reliable yields of groundwater. However, since the yield of a given well depends upon the number and size of water bearing fractures that it intersects, and since the distribution of fractures in bedrock is irregular, there is no practical way, possibly outside of expensive geophysical testing, of predicting the yield of a well drilled in a specific location. Because fractures in the rock generally occur within the first 100 to 150 feet of the surface, it has been shown that the probability of increasing the yield of a well decreases with depth below this level.

Each well should ideally be located on a relatively high portion of a lot, properly separated from the sewage disposal system or any other potential pollutant (e.g., fuel oil storage tank, etc.) and in a direction opposite the expected direction of groundwater movement.

In areas where a number of wells are drilled relatively close together, there may be a chance of well interference (that is, the yield of one well detracting from the yield of another during pumping periods). As a result, it is advisable to space wells as far apart as possible, to minimize the risks of mutual interference.

In the lower Thames and southeastern coastal river basins (which the site lies within), 274 wells tapping crystalline bedrock were surveyed for Connecticut Water Resources Bulletin No. 15. According to the survey, about 90 percent of the wells drilled yielded at least 3 gallons per minute (gpm). A well yield of 3 gpm is generally satisfactory for most domestic uses.

According to the applicant, bedrock wells serving homes, east of the subdivision, along Jeremy Hill Road supplied adequate amounts of water to wells. These wells are presumed to tap bedrock which is the same as the rock unit underlying the site.

The natural quality of groundwater should be satisfactory. However, in some instances, depending upon the composition of underlying bedrock, the presence of iron and/or manganese in water beyond recognized drinking water standards can create problems of taste, color and staining. Where this occurs, it is necessary to treat and remove excessive iron and manganese from the water in order to prevent objectionable conditions.

VI. SEWAGE DISPOSAL

Although the Town does have municipal sewerage disposal facilities, this part of town is beyond the service area and the development in question would be served by on-site subsurface sewage disposal systems.

Based on visual observations and according to soil survey data and deep test hole information, most of the property has a high seasonal groundwater condition in the range of 18-24 inches. The underlying soil, due to the firmness or compactness, has slow permeability and the downward movement of water is restricted resulting in "perched" water. Wetlands also take up a considerable part of the landscape, particularly on lots along Jeremy Hill Road where the amount of usable land area for sewage disposal purposes is limited.

It is noted that the overall density for this subdivision has been reduced from the initial concept of 20 lots. With the possible exception of 1 or 2 lots near the existing house which was originally a part of the subdivision, remaining lots would be in areas of special concern and would, therefore, require detailed engineering design plans for sewage disposal systems. In general, to overcome such limitations, systems should be elevated in suitable fill, made large, and kept shallow and spread out with the natural contours. Also, curtain or groundwater intercepting drains should be utilized and surface water diverted by incorporating drainage swales.

Along with any actual physical construction would be the need for careful layout of houses, drains, wells, sewage systems and separating distances from wetlands, waterways, site features to be kept, etc. Inspection and/or testing of placed fill material prior to the time of actual system installations should also be part of an approved process.

VII. SOILS

A detailed Sediment and Erosion Control Plan should be prepared to comply with the new state law. For further information or questions, contact: U.S.D.A., Soil Conservation Service, New London County, 887-4163.

CcB - Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on glacial till upland hills, plains, and ridges. Stones and boulders cover 1 to 8 percent of the surface. These soils were mapped together because there are no major differences in use and management. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is medium.

This soil warms up and dries out rapidly in the spring. The soil is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium. This soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stones and boulders make the use of farming equipment difficult. These soils are in capability subclass VIs.

PbC - Paxton and Montauk fine sandy loams, 8 to 15 percent slopes

These sloping, well drained soils are on drumloidal, glacial till, upland landforms. These soils were mapped together because there are no major differences in use and management. Permeability of the Paxton soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is rapid. Paxton soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

Permeability of the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. The available water capacity is moderate. Runoff is rapid. Montauk soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

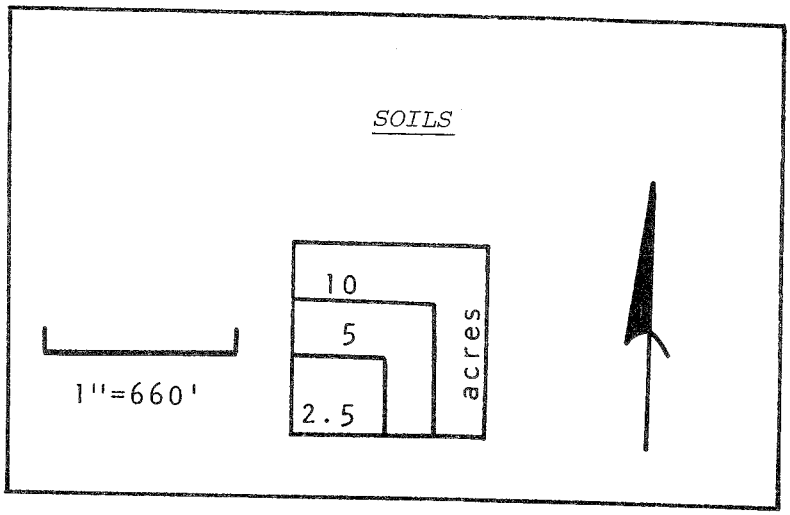
These soils are suited to cultivated crops. These soils are in capability subclass IIIe.

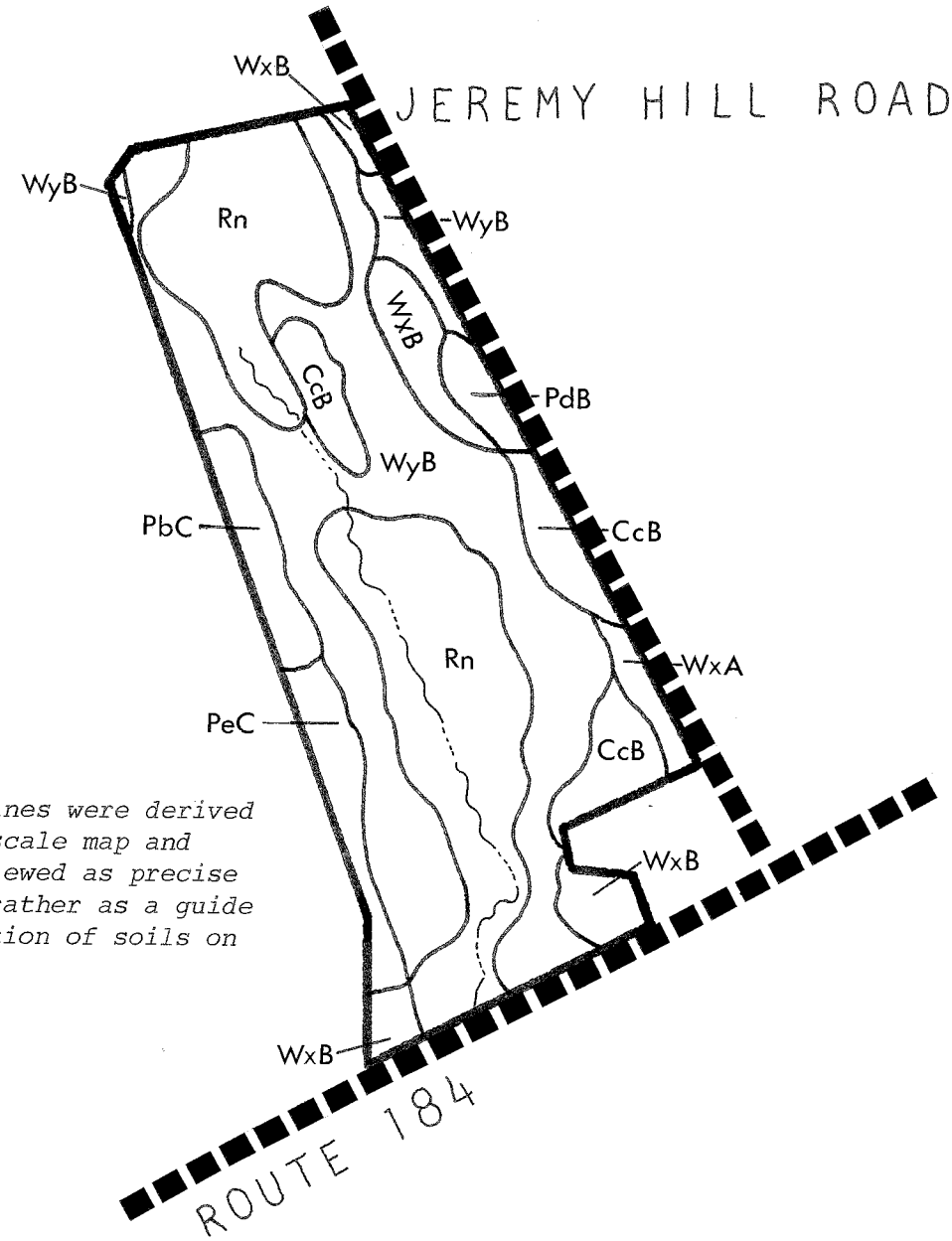
PdB - Paxton and Montauk very stony fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on drumloidal, glacial till, upland landforms. Stones and boulders cover 1 to 8 percent of the surface. These soils were mapped together because there are no major differences in use and management. Permeability of the Paxton soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium. Paxton soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

Permeability of the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. The available water capacity is moderate. Runoff is medium. Montauk soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

These soils are not suited to cultivated crops because stoniness makes the use of farming equipment difficult. These soils are in capability subclass VIs.





Soil boundary lines were derived from a smaller scale map and should not be viewed as precise boundaries but rather as a guide to the distribution of soils on the property.

JEREMY HILL ROAD & RT. 184
Stonington, Ct.

Soils Descriptions & Soils Limitations

Soil Symbol	Soil Name	BUILDING SITE DEVELOPMENT: Dwellings w/o Basements	Dwellings w/ Basements	Lawns and Landscaping	SANITARY FACILITIES: Septic Tank Absorption Fields
CcB	Canton	Slight	Slight	Moderate: large stones	Slight
"	Charlton	Slight	Slight	Moderate: large stones	Slight
PbC	Paxton	Moderate: slope, wetness	Moderate: slope, wetness	Moderate: slope	Severe: percs slowly
PdB	Paxton	Moderate: wetness	Moderate wetness	Moderate: large stones	Severe: percs slowly
PeC	Paxton	Moderate: slope, wetness	Moderate: slope, wetness	Moderate: slope, large stones	Severe: percs slowly
"	Montauk	Moderate: slope, wetness	Moderate: slope, wetness	Moderate: slope, large stones	Severe: percs slowly
Rn	Ridgebury	Severe: wetness	Severe: wetness	Severe: wetness	Severe: percs slowly, wetness
"	Leicester	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
"	Whitman	Severe: ponding	Severe: ponding	Severe: ponding	Severe: percs slowly, ponding
WxA	Woodbridge	Moderate: wetness	Severe: wetness	Moderate: wetness	Severe: percs slowly, wetness
WxB	Woodbridge	Moderate: wetness	Severe: wetness	Moderate: wetnass	Severe: percs slowly, wetness
WyB	Woodbridge	Moderate: wetness	Severe: Wetness	Moderate: wetness, large stones	Severe: percs slowly, wetness

Note - See soils descriptions for Compositon and behavior characteristics

PeC - Paxton and Montauk extremely stony fine sandy loams, 3 to 15 percent slopes

These gently sloping to sloping, well drained soils are on drumloidal, glacial till, upland landforms. Stones and boulders cover 8 to 25 percent of the surface. Permeability of the Paxton soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium or rapid. Permeability of the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. The available water capacity is moderate. Runoff is medium to rapid. Both of these soils warm up and dry out rapidly in the spring. They are strongly acid or medium acid. These soils are not suited to cultivated crops because of stoniness. The major limiting factor for community development is the very slow, slow, and moderately slow permeability in the substratum. On-site septic systems need careful design and installation to prevent effluent from seeping to the surface in areas downslope from the leaching system. These soils are in capability subclass VIIs.

Rn - Ridgebury, Leicester, and Whitman extremely stony fine sandy loams

These nearly level, poorly drained and very poorly drained soils are in drainageways and depressions of glacial till upland hills, ridges, plains, and drumloidal landforms. Stones and boulders cover 8 to 25 percent of the surface. These soils were mapped together because there are no major differences in use and management. The Ridgebury soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow or slow. Ridgebury soil warms up and dries out slowly in the spring. It is strongly acid through slightly acid.

The Leicester soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is very slow or slow. Leicester soil warms up and dries out slowly in the spring. It is very strongly acid through medium acid.

The Whitman soil has a high water table at or near the surface for most of the year. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow, or the soil is ponded. Whitman soil warms up and dries out very slowly. It is very strongly acid through slightly acid.

These soils are not suited to cultivated crops. Stoniness makes the use of farming equipment impractical. These soils are in capability subclass VIIs.

WxB - Woodbridge fine sandy loam,
3 to 8 percent slopes

This gently sloping, moderately well drained soil is on drumloidal, glacial till, upland landforms. The Woodbridge soil has a seasonal high water table at a depth of about 18 inches. It has moderate permeability in the surface layer and subsoil and slow or very slow permeability in the substratum. The available water capacity is moderate. Runoff is medium. This soil warms up and dries out slowly in the spring. Unless limed, it is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is well suited to cultivated crops. This soil is in capability subclass IIw.

WxA - Woodbridge fine sandy loam,
0 to 3 percent slopes

This nearly level, moderately well drained soil is on drumloidal, glacial till, upland landforms. The Woodbridge soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is slow. This Woodbridge soil warms up and dries out slowly in the spring. Unless limed, it is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is well suited to cultivated crops. This soil is in capability subclass IIw.

WyB - Woodbridge very stony fine sandy loam,
0 to 8 percent slopes

This nearly level to gently sloping, moderately well drained soil is on drumloidal, glacial till, upland landforms. Stones and boulders cover 0 to 8 percent of the surface. The Woodbridge soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium. This Woodbridge soil warms up and dries out slowly in the spring. It is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is not suited to cultivated crops because of stoniness. This soil is in capability subclass VIs.

VIII. VEGETATION

The proposed subdivision area can be broken down into several vegetative types. The vegetation map gives a rough approximation of the areas. The vegetative inventory is as follows:

Area #1 - Actively cultivated fields (hay or corn).

Area #2 - This area was field; 30-40 years ago, but now has reverted to a red maple stand with the main canopy trees being eight to ten inches in diameter. Other main canopy species include black gum, mockernut hickory and shagbark hickory. Understory species include spicebush, arrowwood, black cherry seedlings and poison ivy.

Area #3 - This area of predominately red maple is typical of many poorly drained areas. Most of the red maple is of poor form. Other species in the main canopy include white or green ash, sassafras, black gum, and yellow birch. There is also a mid-level canopy of blue beech, red maple, white ash and poison sumac. The understory includes sweetpepper bush, spicebush, azaleas, blueberry, and many unidentified ferns.

Area #4 - This is an area within Area #3 that is almost exclusively red maple, with a dense understory of sweetpepper bush and azaleas. Although these trees are small and quite uniform in size, this was not an old field but rather tree growth that is inhibited by poor water drainage. These areas can easily be killed out by any increase in water level.

Area #5 - This is a varying width strip of land along the western edge of the property. This land rises steeply from the wetland and supports a good growth of oaks. There are some red oak of 24 inches and greater in diameter. Other species include yellow birch, white ash, red maple, shagbark hickory and a few white oak. The mid-level canopy contains saplings of the same species plus blue beech and sugar maple. Understory species include mountain laurel, maple leaf viburnum, blue beech, blueberry, Japanese barberry and ferns.

Area #6 - This is a rather small area of mixed upland hardwoods, predominated by black and white oaks. Other species included are black birch, American beech and red maple.

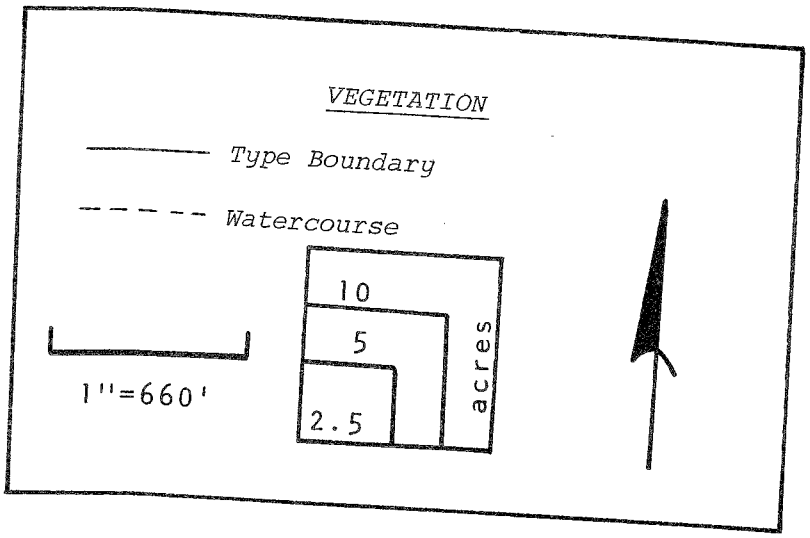
The understory is fairly light. There are some seedling-saplings of the overstory species, especially black birch plus viburnums (mostly mapleleaf) and some sweetpepper bush.

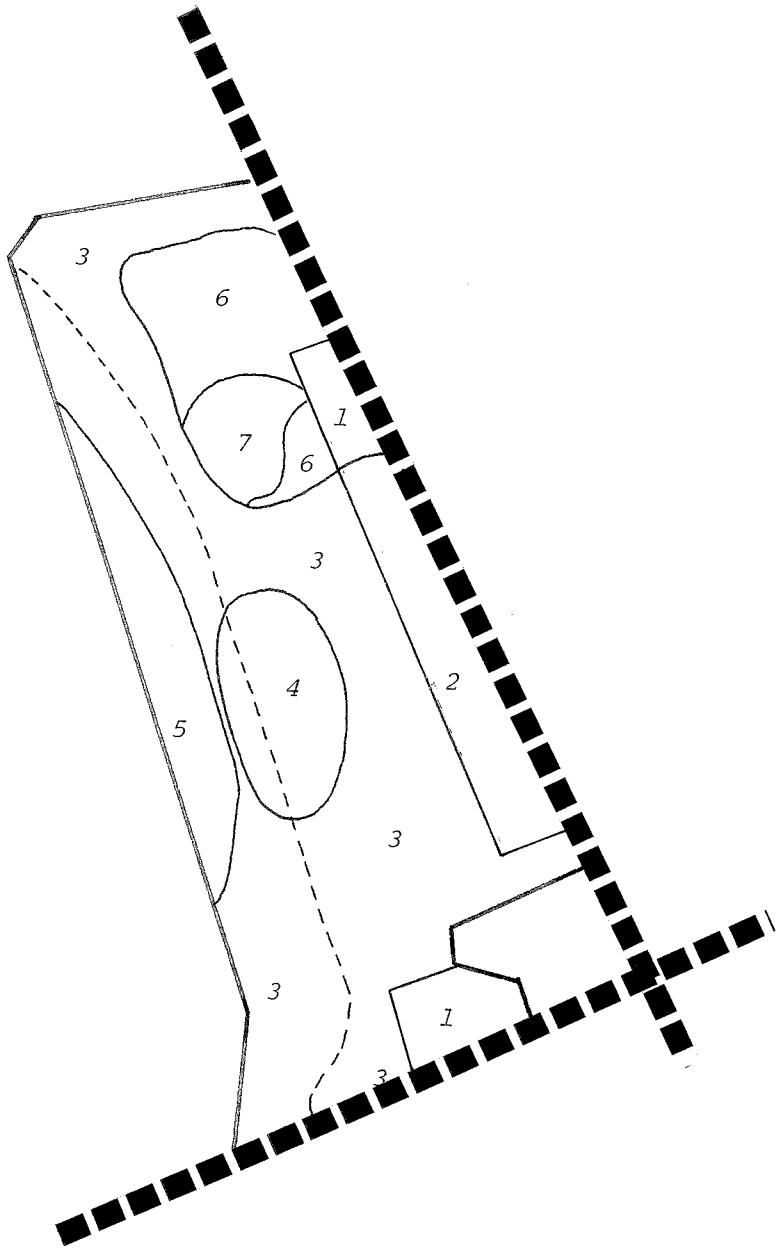
Area #7 - This was part of Area #6, but it has been nearly clearcut for cordwood. There is only a scattering of trees, but the sprouts and understory is the same as in Area #6.

The effect of development on this land is going to be directly related to any change in the present water pattern. Lessening the amount of surface water will favor a change in species, but the change will be mostly in the understory and should not have an adverse effect on the larger trees. On the other hand, an increase in the surface water and/or ponding could cause tree mortality.

If the houses are placed too near the wetland where the trees are shallow-rooted, the openings around the house-lawn area could lead to extensive blowdown.

Development of this area must consider and make plans for any increase in water run-off.


VEGETATION
Type Boundary
Watercourse
10
5
2.5
acres
1"=660'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IX. WILDLIFE HABITAT

Wetlands cover a portion of the proposed project site. Wetlands are absolutely essential areas for many species of wildlife and important to all because they provide habitat requirements needed for survival.

Wetland habitat provides a rich variety of food, cover, nesting and brood rearing sites for a great number of wildlife species. They provide breeding and nesting sites for waterfowl, and habitat for more than 50 species of game and non-game species including beaver, bobcat, fox, mink, muskrat, opossum, white-tailed deer, and snowshoe hare. Because of previous development there is less wetlands available for use by wildlife. Developing any small area by building on it will leave the majority of the area unavailable for wildlife to use.

Development will decrease the amount of habitat simply because the land will be occupied by physical buildings. The quality of the habitat will be decreased because an undeveloped area of land will be broken up with buildings and human activity.

Some species which require larger undeveloped areas will probably be forced out or will reduce their use of the area. They may be able to move into adjacent undeveloped areas if ther eis suitable habitat available and the competition with other species already occupying the area is not too great.

Other species which are more adaptable to man's presence will probably remain. Some new species may even be attracted to the area.

If carried out, the following wildlife recommendations can help lessen the impact to some species using the area. Some animals will leave the area, but others may find it even more attractive after development.

1) Design of Development/Wetlands

The impact on wildlife of the area can be lessened to some degree if some thought is given to the development. Housing developments can be designed in two basic ways. Houses can be built on larger house lots or they can be built on small lots or in clusters, leaving open space areas. Both designs leave more open space for wildlife as opposed to having small lots and developing the entire acreage.

Probably none of the wetland areas should be developed due to the severe limitations caused by soil capabilities and the regulations governing their development. They are important to wildlife as feeding, nesting and cover areas.

A buffer area of uncut vegetation should be left along the entire length of the watercourse. This will provide food, cover and nesting sites for many species. Because the brook will remain shaded, water

temperatures will not rise, making the brook uninhabitable for some species.

2) Clearing

When the initial clearing for building is done, try to leave as many trees and shrubs as possible, especially those useful to wildlife. Some useful species include:

white oak (Quercus albra)
red oak (Quercus rubra)
black cherry (Prunus serotina)
quaking aspen (Populus tremuloides)
red-osier dogwood (Cornus stolonifera)
apple (Malus spp.)

3) Landscaping

On small acreage with many buildings, landscaping can do a great deal to provide habitat and make an area attractive to wildlife. First, leave as many trees as possible around the buildings. This will not only benefit wildlife by providing food, cover and nesting sites (especially for songbirds), but will also be more aesthetically pleasing for the residents of the development.

Leave as many snag trees (standing dead trees) and den trees (trees with holes) as possible. These trees are used by insect eating birds and cavity nesting birds and mammals.

Plant trees and shrubs which are useful to wildlife and landscaping such as:

Japanese barberry (Bergeris bulgaris)
flowering dogwood (Cornus florida)
honeysuckle (Lonicera spp.)
juniper (Juniperus spp.)
bayberry (Myrica pensylvanica)
red-osier dogwood (Cornus stolonifera)
American mountain ash (Sorbus americana)
chokecherry (Prunus virginiana)
autumn olive (Elaegnus umbellata)
winterberry (Ilex verticillata)
American cranberrybush (Veburnum trilobum)
red maple (Acer rubrum)
maple-leaved birburnum (Biburnum acerifolium)
alternate leaf dogwood (Cornus stolonifera)
American holly (Ilex opaca)

A variety of trees and shrubs should be used. Most species of wildlife need to have cover when they move from place to place. By leaving corridors of vegetation, this will allow wildlife to utilize the area and also have access to adjacent areas. Large expanses of lawn with no trees or shrubs present should be discouraged. These factors will allow wildlife to better utilize the area and thus make it more attractive to wildlife.

X. PLANNING CONCERNS

The subdivision that is the subject of this report is located in a relatively rural area of the Town of Stonington. The property is zoned RR-80 (Rural Residence 80). It is proposed that the subdivision contain fifteen lots, ranging in size from 1.84 acres to 7.3 acres. Four of these will have access from State Route 184, and the remainder from Jeremy Hill Road, a two-land town road. To the east of the proposed subdivision, across Jeremy Hill Road, is another subdivision in which most of the houses have already been constructed and are occupied. To the west and north of the proposed subdivision, the land is largely undeveloped. The only commercial activity in the immediate neighborhood is a motel and camper sales facility which is located on the southeast corner of Route 117 and Jeremy Hill Road, diagonally across from the proposed subdivision. The subdivision does border on its north side with the Town of North Stonington. The adjacent land in North Stonington is also largely undeveloped.

The traffic impact of the proposed fifteen single-family houses would seem to be small. The Connecticut Department of Transportation's 1982 Traffic Log* gives a figure of 3,300 vehicles per day for the Average Daily Traffic (ADT) on the section of Route 12 which includes the intersection with Jeremy Hill Road. Connecticut Department of Transportation data** also indicate that the mean number of trips per day per single-family house in a subdivision is 10.6.* If we take a worst case and assume that all trips generated by all fifteen houses in the subdivision would utilize Route 184, then traffic on that roadway would be increased by 159 trips, an increase in the ADT of 4.8%. This percentage, of course, represents the worst possible case, as some trips are certain to be on Jeremy Hill Road with destinations to the north or south. These would not affect Route 184. However, commuting to the major employment areas in Groton and New London would utilize Route 184. Nevertheless, the impact on that route could not be expected to be large.

As mentioned above, there is another already-developed subdivision directly across Jeremy Hill Road from this proposal. It is suggested that, if possible, the driveways in the subdivision under consideration here should be arranged to be opposite those on the other side of the road, in order to minimize conflicts between vehicles simultaneously entering or leaving those driveways.

In summary, provided that the natural resource problems discussed elsewhere in this report are satisfactorily solved, this proposed subdivision should not cause any difficulties. In fact, it could be considered a logical extension of the subdivision already existing across Jeremy Hill Road.

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* Traffic Log of State Numbered Routes and Roads, 1982. Connecticut Department of Transportation.

** Trip Generation Study of Various Land Uses, Connecticut Department of Transportation, 1974.

XI. SUMMARY

TOPOGRAPHY AND GEOLOGY - Page 2

The parcel is characterized by terrain that slopes gently towards a wetland area in the central portion of the property. A small stream originates in this wetland and eventually empties into Wheeler Brook.

The depth to bedrock is unknown, but it should not pose a major problem in developing the site. Overlying the bedrock is a blanket of till, the upper layer being sandy, and the lower layer becoming more silty and firm.

Seasonally wet areas, comprised of regulated inland-wetland soils parallel the stream. Because of wetness these areas have little potential for development and on-site septic systems.

GEOLOGIC DEVELOPMENT CONCERNS - Page 7

The major geologic limitations of the site are: (1) areas of seasonal wetness (delineated as Rn and Rd on the soils map), (2) the compact nature of most of the till soils on the site, which commonly result in a seasonally high water table, (3) the presence of numerous surface boulders which may be a nuisance for excavation and landscaping. In many cases, proper engineering and planning can overcome the above limitations.

See page 7 for a discussion of possible layouts for houses, septic systems and wells.

Any wetland crossings must be properly designed, and it is recommended that any road construction through wetland areas should be done during the dry time of the year. Detailed plans of wetland crossings should first be submitted to the town authorities for their review and comment prior to any construction.

HYDROLOGY - Page 8

The proposed subdivision lies within the drainage area of an unnamed tributary to Wheeler Brook. The overall drainage area of the streamcourse is approximately 143 acres.

Development of the site will lead to some increases in runoff. Based on estimates, the resultant peak flow increases to the unnamed stream should not have a significant effect on the wetlands and downstream areas. The project engineer should check the 36" culvert passing under Route 184 as a precautionary measure.

It is advised that the wetland areas on the site should be left undisturbed since they are important in serving several positive hydrological functions.

WATER SUPPLY - Page 10

It appears that wells on the site will have to tap the underlying bedrock aquifer. Each well should ideally be located on a relatively high portion of a lot, properly separated from the sewage disposal system or any other potential pollutants, and in a direction opposite the expected direction of groundwater movement.

SEWAGE DISPOSAL - Page 12

The property has a high seasonal groundwater condition, and the underlying soil, due to compactness, has slow permeability and downward movement of water is restricted resulting in "perched" water. Wetlands also limit the amount of usable land area suitable for sewage disposal systems.

Most lots are in areas of special concern and would require detailed engineering design plans for sewage disposal systems. For further discussion of plans, see pages 7 and 12.

SOILS - Page 12

A detailed Sediment and Erosion Control Plan should be prepared to comply with the new state law.

VEGETATION - Page 17

The proposed subdivision may be broken down into 7 vegetative types. See vegetation map for areas covered.

The effect of development on this parcel is directly related to any changes in the present water pattern. An increase in the surface water and/or ponding could cause tree mortality. Lessening the amount of surface water will favor a change in species. If houses are placed too near the wetland area where the trees are shallow rooted, the openings around the house/lawn area could lead to extensive blowdown.

WILDLIFE HABITAT - Page 20

The wetlands portion of the site serves an important function for wildlife by providing habitat requirements needed for survival. Development will decrease the amount and the quality of habitat, but there are management considerations which would lessen the impact on wildlife. Thought should be given to the design of the development so that as much open space as possible is left. A buffer area of vegetation should be left along the watercourse. As many trees as possible should be left when clearing for building, and landscaping should be down with wildlife in mind.

PLANNING CONCERNS - Page 22

The traffic impact of the proposed subdivision would appear to be small, even when a worst case is calculated.

It is suggested that the driveways of the proposed subdivision be arranged opposite those on the other side of Jeremy Hill Road to minimize conflicts between vehicles simultaneously entering or leaving the driveways.

This proposed subdivision could be considered a logical extension of the subdivision already in existence across Jeremy Hill Road.