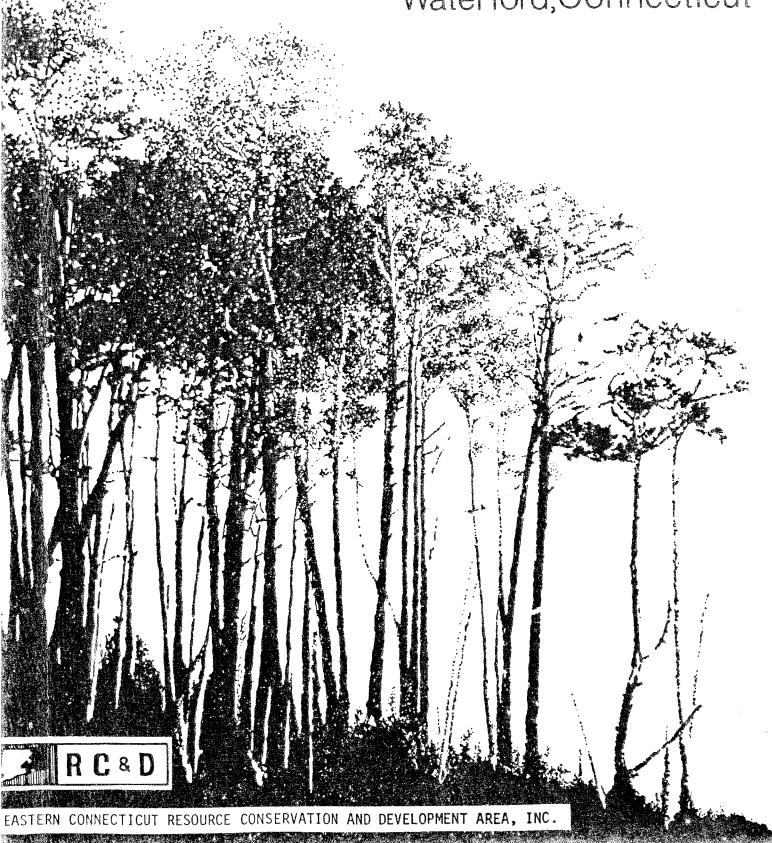
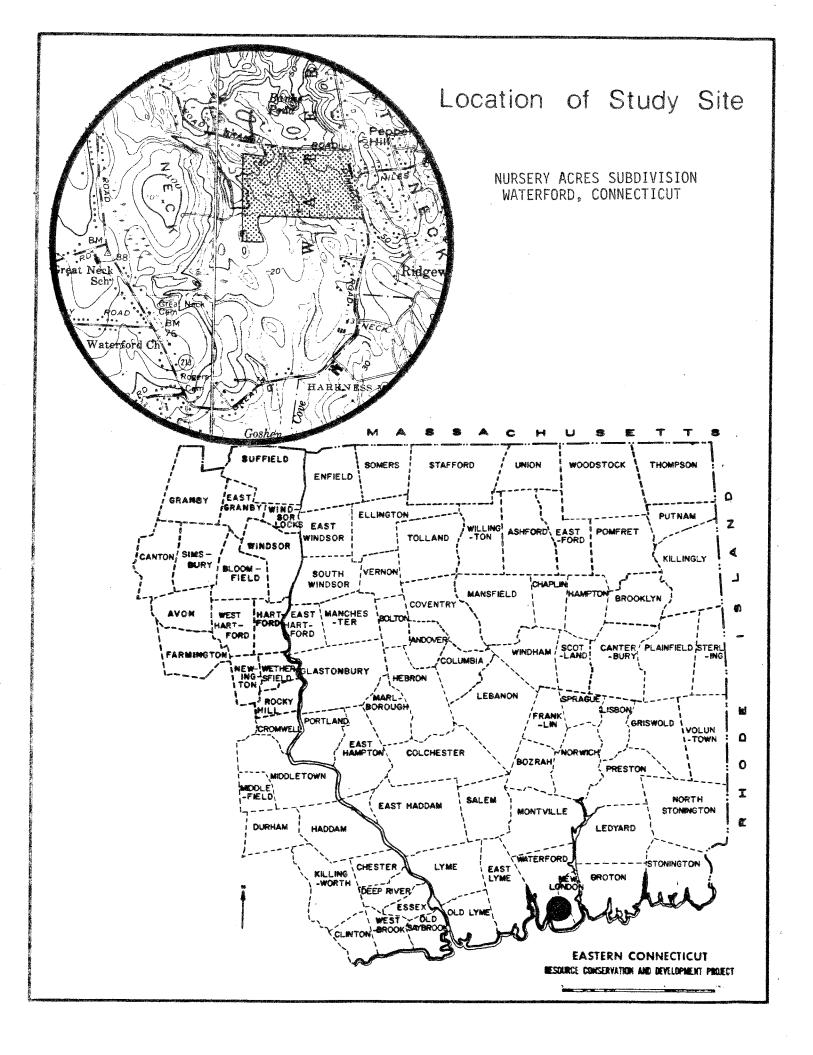
# Environmental Review Team Report Nursery Acres Waterford, Connecticut





## ENVIRONMENTAL REVIEW TEAM REPORT ON NURSERY ACRES WATERFORD, CONNECTICUT

This report is an outgrowth of a request from the Waterford Conservation 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 as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

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

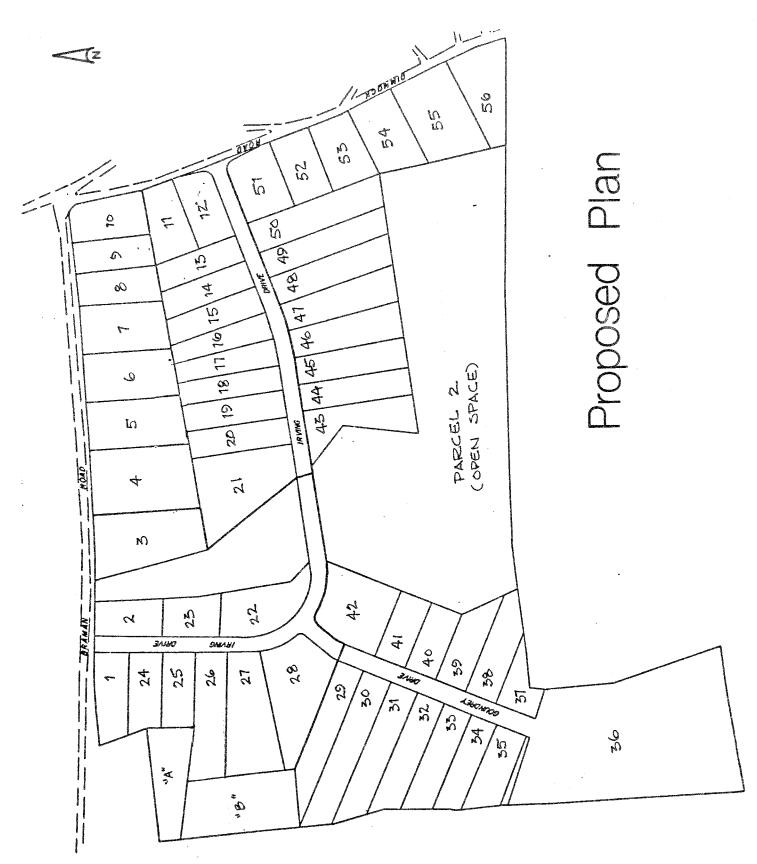
The ERT that field checked the site consisted of the following personnel: Barry Cavanna, District Conservationist, Soil Conservation Service (SCS); Chuck Phillips, Fisheries Biologist (DEP); Bill Warzecha, Geologist, Department of Environmental Protection (DEP); Pete Merrill, Forester (DEP); Tom Seidel, Regional Planner, Southeastern Connecticut Regional Planning Agency; Don Capellaro, Sanitarian, State Department of Health; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Thursday, January 3, 1985. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Waterford. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

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

If you require any additional information, please contact Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, Box 198, Route 205, Brooklyn, Connecticut 06234, 774-1253.



#### INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a proposed subdivision of land in the Town of Waterford. The project site is approximately 69+ acres in size and is located south and west of the intersection of Braman and Dimmock Roads. The property is presently owned by St. Joseph's Church in New London. Preliminary plans for the subdivision have been prepared by William Kent.

Preliminary plans show 56 lots of approximately one-half acre each. Public water supply will be available to each lot. On-site septic systems will be necessary on each lot, as the municipal sewer line ends approximately one mile from the site. A road, to be known as Irving Drive, will connect Braman and Dimmock Roads through the central portion of the property, affording access to interior lots. A spur road, Goundry Drive, will provide additional access. Irving Drive will cross regulated wetland soils in at least three locations. Goundry Drive will cross a small wetland area not presently shown on the preliminary plans (November 11, 1984). Thirteen acres of the property will remain as open space. The property lies within an R-40 (one acre minimum) zone; however, the developer has applied for a "Performance" zoning permit which allows for smaller lot sizes when a portion of the property is kept as open space.

The property is generally flat to moderately sloping. Goshen Cove Brook runs through the central section of the site. A small impoundment of this Brook is located north of the proposed location of Irving Drive. Associated wetland areas extend throughout the property. Several wetland areas observed by the Team during the field review have not been located on the site plan. These wetlands are in the general area of lots 5, 6, 7, 8, 30, 31, 32, 39 and 40. Bedrock outcrops were also observed during the field review in the areas shown generally as CrC (Charlton-Hollis series) on the accompanying soils map.

The Team is concerned with the effect of the proposed development on the natural resource base of this site. Although many severe limitations to development can be overcome with proper engineering techniques, these measures can become costly, making a project financially unfeasible for a developer. Severe limitations to development of this site include regulated wetland soil areas, areas of shallow soil depth to bedrock, areas of rapidly permeable soils and soils which have seasonally high water tables. These limitations will have bearing on the location and proper functioning of on-site septic systems, location of home sites and roadways. Lots 11, 12, 55 and 56 will require wetland crossings in order to utilize non-wetland areas on each lot for building. Lots 50 and 54 are marginal at best, as wetland soils comprise 80-85% of the total land area for each lot. It is questionable whether both a house and septic system could be located on these lots with the required separating distances. Wetland soils also comprise 1/4 to 1/3 of the land area on lots 46, 47, 48, 49, 55 and 56. Approximately 1/3 of the total number of proposed lots ( $20\pm$  of 56) are effected by wetlands (shown or not shown on preliminary plans); those effected by shallow depth of soil to bedrock have

not been determined at this time, however, this could become a concern for the developer when considering measures to overcome these limitations.

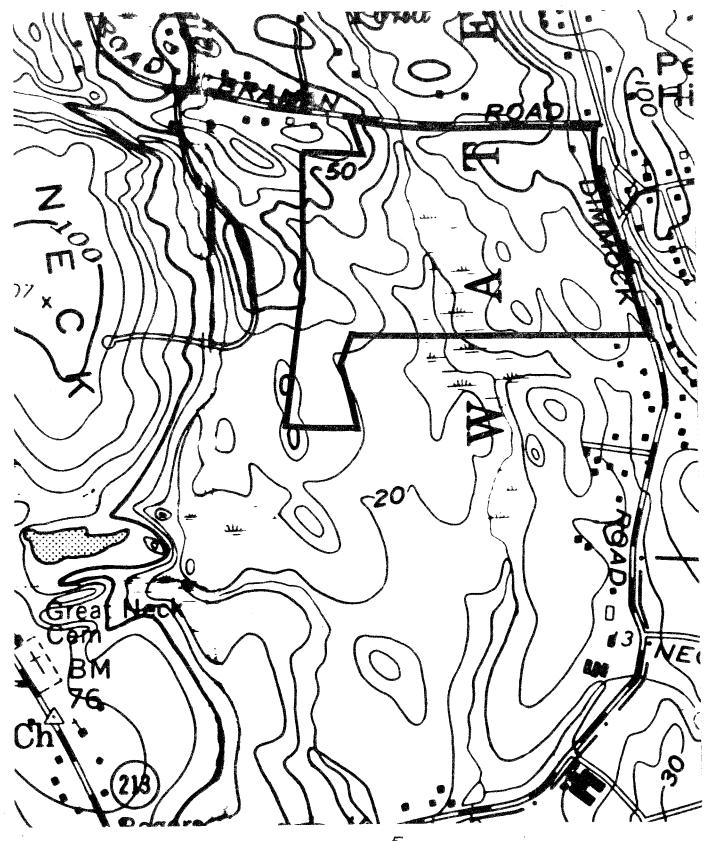
The appropriate Commissions should carefully consider the detailed comments made in the following sections of this report. It would appear that the number of lots presently proposed for this property exceeds the "carrying capacity" of the site. Larger lot sizes would seem more appropriate under these conditions.

Topography

Site Boundary



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#### ENVIRONMENTAL ASSESSMENT

#### TOPOGRAPHY

The ±69 acre project site is located in the southern part of Waterford south of Braman Road and west of Dimmock Road. The land within the property slopes gently towards the streamcourse (Goshen Cove Brook) bisecting the central section. Numerous bedrock outcrops are visible throughout the eastern and western portions of the site and as a result, control the topography to a large extent. Maximum and minimum elevations on the site are ±70 feet and 20 feet above mean sea level, respectively. A small pond, which is an impoundment of Goshen Cove Brook is located in the central portion of the site. This pond is presently being considered as a potential detention basin site for stormwater emanating from the proposed development (see hydrology section). Approximately 20 percent of the property is presently comprised of cultivated fields for a nursery operation.

#### **GEOLOGY**

The subject parcel is located entirely within the New London topographic quadrangle. A bedrock geologic map (GR-574) and a surficial geologic map (GQ-176) by Richard Goldsmith have been published by the U.S. Geological Survey.

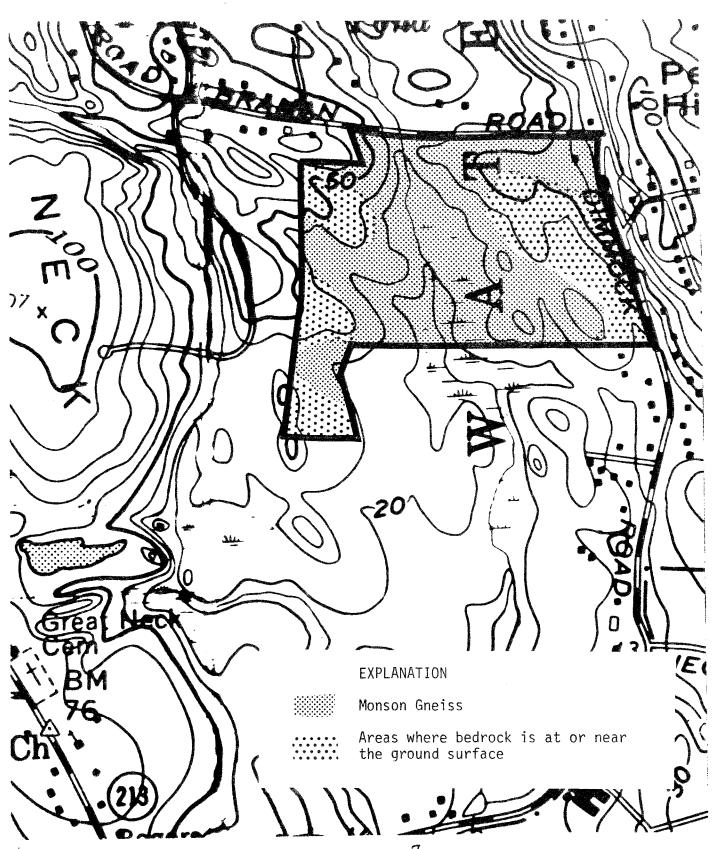
Bedrock outcrops conspicuously throughout the eastern and western parts of the site. Goldsmith classifies the rock type underlying or outcropping within the site as Monson Gneiss. It is a gray to dark gray, medium to coarse grained gneiss composed essentially of the minerals biotite, hornblende, plagioclase and quartz. Trace amounts of the minerals garnet, epidote and magnetite may also be present in the rock. The term "gneiss" is given to crystalline, metamorphic rock (rocks altered by great heat and pressure in the earth's crust) in which bands, rich in granular minerals, alternate with bands in which platy, flaky, or elongated minerals predominate. Depth to bedrock range from zero in rock outcrop areas to probably not much more than 10 feet at various points in between outcrops.

Overlying the bedrock on most of the site is a generally thin cover of material composed of non-sorted, non-stratified rock particles and fragments. This material is referred to as till. "Till" is a glacial sediment which was deposited directly from glacier ice without subsequent re-working by meltwater streams. Rock particles and fragments composing the till range in size from clay to boulders. In general, the till within the site is generally stony, sandy and friable, in the upper few feet, but in some areas it may become siltier, less stony and more compact. Thickness of the till ranges from zero in rock outcrop areas to probably less than 10 feet throughout the remaining portions of the sites. It should be noted that an abundance of large surface boulders are strewn throughout the upland areas in the eastern half of the property.

## Bedrock Geology



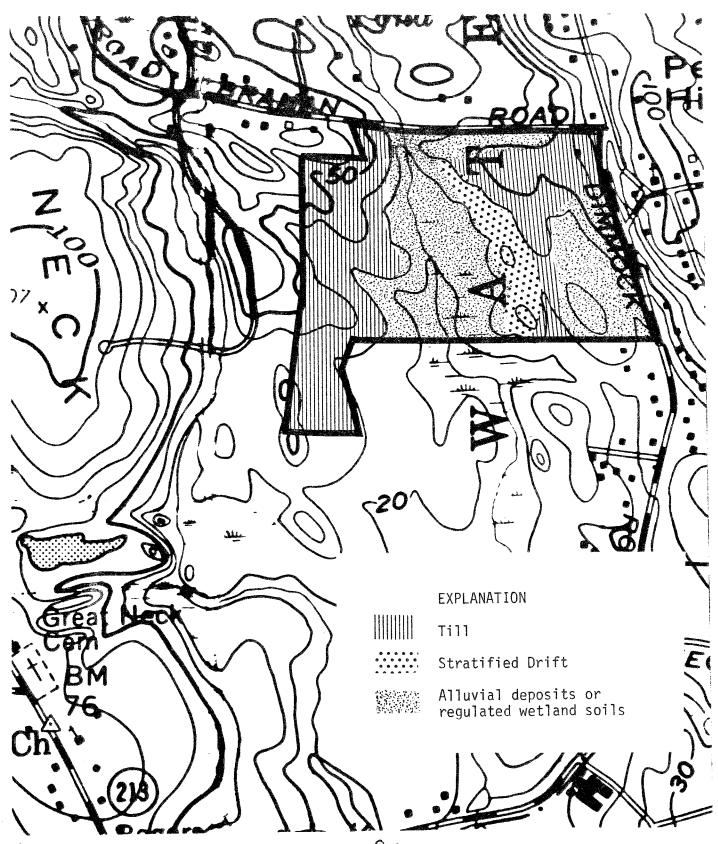
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## Surficial Geology







Another type of glacial deposit found within the site is glacial stream deposits or stratified drift. These deposits, which occupy the valley through which Goshen Cove Brook runs consist of silt, sand and gravel. They were deposited by glacial meltwater streams as glacier ice retreated. Stratified drift deposits are delineated by the symbol HcA, HcB (Haven soils) and Nn (Ninigret soils) on the soils map. The thickness of the stratified drift on the property does not exceed much more than 10 feet (Source: Connecticut Water Resources Bulletin #15).

Overlying till and/or stratified drift astride Goshen Cove Brook are post-glacial deposits called alluvium. These deposits also parallel Dimmock Road in the eastern parts. Alluvial deposits consist of silt, sand and gravel in floodplains of existing streamcourses. These deposits, which are delineated by the symbols Aa (Adrian and Palms mucks) and Wd (Walpole soils) are regulated inland-wetland soils.

Wetland areas through the central portions of the property serve the purpose of diminishing the potential peak flow in Goshen Cove Brook and reduce the chances for flooding downstream. Consequently, destroying wetlands by filling and/or modification may increase those chances. Other important hydrological and ecological functions of wetlands on the site include pollution control and providing habitat for waterfowl and other wildlife. A decision to keep the wetland free from disturbance, i.e., development, filling, and modification, is a judicious one.

Prior to approving any wetland filling(s) or modification, the Town should first require the applicant to assess all of the risks involved in permitting a particular wetland area to be filled from a hydrologic standpoint. Wetland areas approved for filling or modification should be accompanied by a comprehensive erosion and sediment control plan. Wetlands within the site should be staked. This will provide a visual aid to contractors during site development.

#### Development Concerns

The geological limitations which may pose constraints with regard to the proposed subdivision include: (1) areas where bedrock is at or near the surface of the ground; (2) areas containing regulated inland-wetland soils (Aa and Wd on the soils map); and (3) areas containing soils (primarily the soils delineated as Nn on the soils map) which have seasonally high water tables. It should be noted that seasonally high water tables can be encountered with some of the till based soils on the property especially in low lying areas and near streamcourses. These limitations will weigh heaviest on the installation of subsurface sewage disposal systems, foundation placement, and road/driveway construction.

In terms of subsurface sewage disposal, properly engineered and installed systems may be able to surmount the above noted limitations in many instances. Careful planning and testing on each lot is imperative in order to avoid most septic system problems. The soil testing should be conducted during the spring of the year when conditions of adverse wetness are common.

This is particularly important for soils which have seasonally high water tables. Because depth to bedrock is highly variable throughout the site, it is recommended that a sufficient number of deep test pits be excavated on each lot in the proposed leaching field area, particularly in areas where visible rock outcropping is extensive.

In areas where bedrock is at or near ground surface, it may be necessary to blast in order to construct access roads and/or place house foundations. Since the steepest slopes on the site are associated with these areas, it is recommended that a detailed erosion and sediment control plan be formulated and followed very closely with implementation of the project.

Development in designated inland-wetlands areas should be avoided if possible. Based on the site plan submitted to Team members on the day of the field review, it appears that wetlands on the parcel will be crossed by the interior road system in at least three locations. These crossings which consist of about +70 feet, +90 feet and +40 feet are located on Irving Drive in the central and eastern portion of the site. Additional crossings of wetland soils by driveways may also be requested, depending on the final project layout. Although undesirable, wetland road crossings are feasible, provided they are properly engineered.

When crossing wetland soils with roads or driveways, provisions should be made for removing unstable material beneath the road bed, backfilling with a permeable road base fill material, and installing culverts as necessary. The roads should be at least 1.5 feet and preferrably 2 feet above the surface elevation of wetlands. This will allow for better drainage of the roads. It will also decrease the frost heaving potential of the road. Road construction through wetlands should preferably be done during the dry time of the year and should include provisions for effective erosion and sediment control. It is particularly important that culverts be properly sized and located so as not to alter the water levels in the wetland.

Based on the site plan, a large percentage of wetland soils comprise lots 50 and 54. As a result, it may be necessary to combine these lots with adjacent lots, in order to find a suitable area for the sewage disposal system.

#### HYDROLOGY

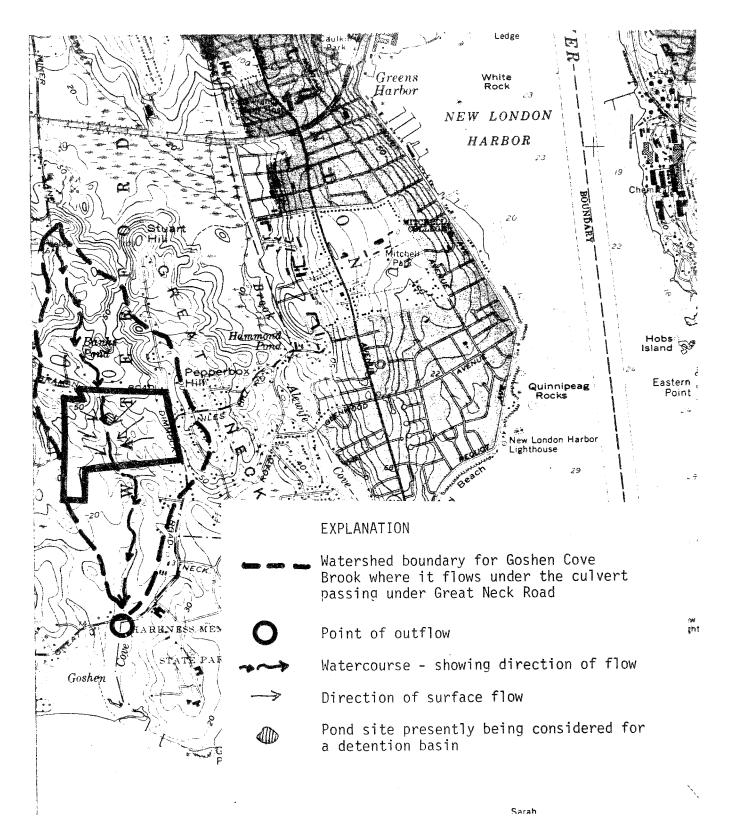
The site is drained entirely by Goshen Cove Brook which flows southward through the wetlands in the central portions of the property. It ultimately empties into Goshen Cove south of the site. At the point where the Brook enters the culvert passing under Great Neck Road, the drainage area for Goshen Cove Brook is about 368 acres or .575 square miles.

Development of the property under the present proposal will increase the percentage of runoff from the site for a given rainfall amount. This difference would result from the construction of impermeable surfaces, such as

### Drainage Areas







-11-

roof tops and paved driveways/roads, over formerly permeable areas; the compaction of soils; and the removal of trees and other natural vegetation.

Peak flows for storms of various magnitudes (e.g., 10-year, 24-hour storm, etc.) may be estimated by a method outlined in Technical Release No. 55, published by the Soil Conservation Service of the U.S. Department of Agriculture. The method involves the determination of runoff curve numbers for a given watershed. A higher curve number indicates that a given amount of runoff will be greater. These numbers relate runoff to rainfall in the watershed on the basis of soil types and the current and proposed land usage. Applying the numbers to rainfall data for given storm events, average slope of the watershed, as well as several other factors, an estimate of peak-flow in a stream can be made. For the purposes of analyzing the peak flows likely to occur under the proposal, a design point and its corresponding watershed was chosen (see Drainage Area Map). The drainage area shown is based upon a particular design point and delineates all the land from which surface runoff ultimately reaches that point.

The results of the Team geologist's calculations, shown below for the design point chosen, should be considered as "ball park" figures with regard to the estimated peak flows and runoff volumes. The calculated <u>percentages</u> of increase, however, should be fairly close.

#### TABLE 1

Peak flows for before-development and after-development conditions at design point shown on the <u>Watershed Boundary Map</u>. All flows given in cubic feet per second.

	10 year 24 hr storm	25 year 24 hr storm	50 year 24 hr storm	100 year 24 hr storm
Before development *Curve number (64)	122	170	215	288
After development *Curve number (66)	134	184	232	307
Percent Increase	10 percent	8 percent	8 percent	7 percent

#### TABLE 2

Runoff volume increases estimated under the present proposal. Estimates are recorded in inches.

	10 year 24 hr storm	25 year 24 hr storm	50 year 24 hr storm	100 year 24 hr storm
Before development	1.58	2.05	2.48	3.07
After development	1.73	2.22	2.67	3.28
Percent Increase	9 percent	8 percent	8 percent	7 percent

Although the increases shown in the tables above are 10 percent or less, it is recommended that careful consideration of stormwater management be given. It is suggested that the applicant be required to submit detailed hydrological information prior to approval of the proposed subdivision.

This information should include pre- and post-development runoff estimates from the site for the 10, 25, 50 and 100 year storm events. Because the Town would like to see off-site flows following the development maintained at present levels, a possible method for controlling runoff on the site might be to establish a detention basin or basins which would alleviate peak flows. Detailed design specifications for all stormwater detention basins should be submitted and reviewed by appropriate town officials. In addition, all storm drain outlets should include a designed energy dissipator to help protect areas below the outlet from gullying.

According to the project spokesman, the small pond in the central portion of the site is presently being considered as a detention basin for handling post-development flows. It does not appear that this pond is in a hydrologic position to noticeably mitigate the increased runoff flows from the site. A detention basin located at the southern property boundary may offer more protection. If relocating the pond is not feasible, the capacity of the existing pond may need to be increased so that it compensates for runoff from developed land areas which cannot be detained by the basin.

#### SOILS

A detailed soils map of this site and detailed soils descriptions are included in this section of the report. This map is a reproduction of the mapped information appearing in the Soil Survey of New London County, Connecticut published by the USDA Soil Conservation Service. The soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The detailed soil descriptions which follow discuss the limitations of each of the soil types for development purposes. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used.

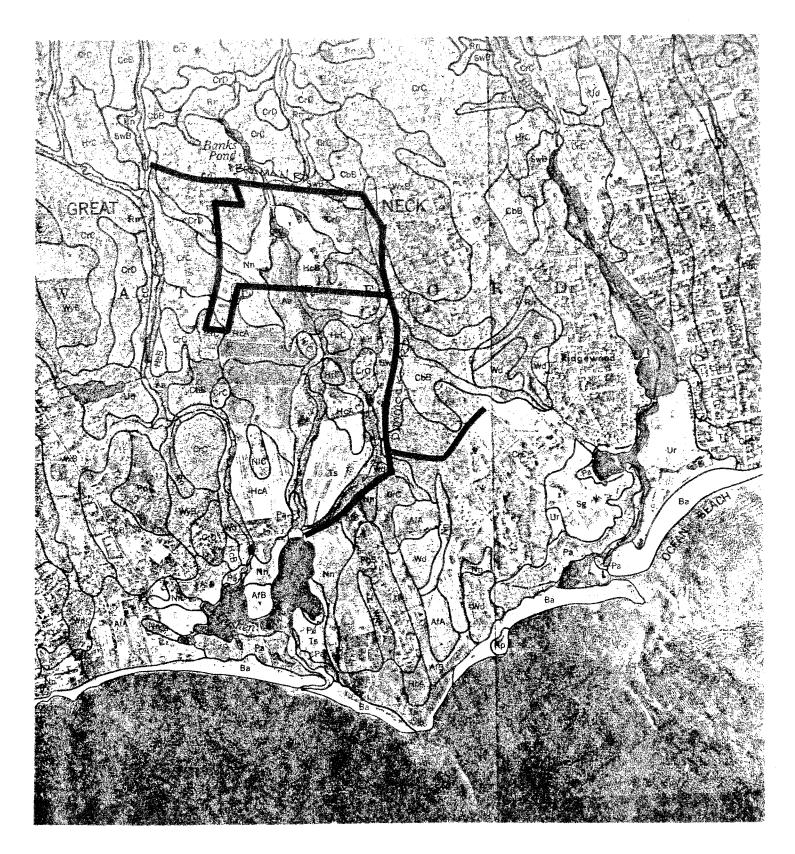
Soils typical of this site include the Adrian-Palms series, the Charlton-Hollis series, the Haven series, the Ninigret series and the Walpole series. The Adrian-Palms and Walpole soils are regulated wetland soils under Public Act 155. Detailed descriptions of these soil types follow.

(Aa) -- Adrian and Palms mucks. These nearly level, very poorly drained soils are in pockets and depressions of stream terraces, outwash plains, and glacial till uplands. Slopes range from 0 to 2 percent.

## Soils



A



The mapped acreage of this undifferentiated group is about 55 percent Adrian soils, 30 percent Palms soils, and 15 percent other soils. Mapped areas consist of either Adrian soils or Palms soils, or both. These soils were mapped together because there are no major differences in most uses and management.

Typically, the Adrian soils have black and very dark grayish brown layers of muck 42 inches thick. The substratum is gray, light yellowish brown, and strong brown gravelly sand to a depth of 60 inches or more.

Typically, the Palms soils have black and very dark brown layers of muck 22 inches thick. The substratum is dark yellowish brown and olive very fine sandy loam and loamy very fine sand to a depth of 60 inches or more.

Included with these soils in mapping are small areas of poorly drained Ridgbury, Leicester, Raypol, Walpole, Limerick Variant, and Rippowam soils and very poorly drained Carlisle, Whitman, and Scarboro soils.

Adrian soils have a high water table which is at or near the surface for most of the year. Permeability is moderately rapid in the organic layers and rapid in the substratum. The available water capacity is high. Runoff is very slow or ponded. Adrian soils are strongly acid through slightly acid.

Palms soils have a high water table which is at or near the surface for most of the year. Permeability is moderately rapid in the organic layers and moderately slow in the substratum. The available water capacity is high. Runoff is very slow or ponded. Palms soils are strongly acid through slightly acid.

These soils are suited to trees. Wetness and low strength make machine planting of seedlings and construction and use of woodland roads impractical. Windthrow is common because of the shallow rooting depth above the water table.

These soils are poorly suited to community development. The major limiting factors are low strength and a high water table which is at or near the surface for most of the year. If drained, the organic material shrinks and subsides. Wetness and low strength make the establishment and maintenance of lawns and gardens difficult.

(CrC)--Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes. This gently sloping to sloping complex consists of somewhat excessively drained and well drained soils on glacial till uplands. Rock outcrops cover up to 10 percent of the surface. Stones and boulders cover 1 to 8 percent of the surface.

The soils of this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used. This complex is about 55 percent Charlton soil, 20 percent Hollis soil, and 25 percent other soils and rock outcrops.

Typically, the Charlton soil has a very dark grayish brown, fine sandy loam surface layer 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 26 inches thick. The substratum is grayish brown fine sandy loam to a depth of 60 inches or more.

Typically, the Hollis soil has a very dark brown, fine sandy loam surface layer 2 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 15 inches thick. Hard, unweathered bedrock is at a depth of 17 inches.

Included with these soils in mapping are small areas of well drained Canton, Narragansett, Paxton, and Montauk soils; moderately well drained Sutton and Woodbridge soils; and poorly drained Leicester soils. Many small areas have bedrock at a depth of 20 to 40 inches. A few small areas in the northwestern part of the county have redder colors in the subsoil.

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

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

These soils are suited to trees. Stoniness and rock outcrops hinder machine planting in many places. Windthrow is common on the Hollis soil because of the shallow rooting depth.

The major limiting factor for community development is the shallow depth to bedrock. Extensive onsite investigations are often needed to locate a suitable site for an onsite septic system. Onsite septic systems need special design and installation to prevent effluent from seeping to the surface in areas downslope from the leaching system. Excavations require blasting in many places. Quickly establishing a plant cover and using mulch and netting, temporary diversions, and sediment basins help to control erosion during construction. Stones and boulders need to be removed for landscaping. The Hollis soil has a shallow rooting depth to bedrock and is droughty. Rock outcrops provide attractive settings for homes in many places.

(HcB)--Haven silt loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on stream terraces and outwash plains. Typically, this Haven soil has a dark brown, silt loam surface layer 7 inches thick. The subsoil is brown, yellowish brown, and dark yellowish brown silt loam 16 inches thick. The substratum is light yellowish brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, well drained Agawam soils, and moderately well drained Ninigret and Tisbury soils. A few areas have a gravelly surface layer and subsoil. Included areas make up about 15 percent of this map unit.

Permeability of the Haven soil is moderate in the surface layer and subsoil and very rapid in the substratum. The available water capacity is high. Runoff is medium. Haven soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid. This soil is suited to trees. Machine planting is practical.

Onsite septic systems function with normal design and installation, but they can pollute the ground water in places. Slopes of excavated areas are unstable. Quickly establishing a plant cover and using mulch, temporary diversions, and sediment basins help to control erosion during construction.

(Nn)--Ninigret fine sandy loam. This nearly level to gently sloping, moderately well drained soil is on outwash plains and stream terraces. Slopes range from 0 to 5 percent. Typically, this Ninigret soil has a very dark grayish bown, fine sandy loam surface layer 8 inches thick. The subsoil is yellowish brown, mottled fine sandy loam 18 inches thick. The substratum is pale brown, mottled loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Agawam and Haven soils, moderately well drained Sudbury and Tisbury soils, and poorly drained Raypol and Walpole soils. Included areas make up about 15 percent of this map unit.

The Ninigret soil has a seasonal high water table at a depth of about 20 inches. Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is high. Runoff is slow or medium. Ninigret soil warms up and dries out slowly in the spring. Unless limed, it is strongly acid or medium acid.

This soil is suited to trees. Machine planting is practical.

The major limiting factor for community development is the seasonal high water table. Onsite septic systems need special design and installation, and fill is required in many places. Onsite septic systems pollute the ground water in places. Slopes of excavated areas are unstable. Foundation drains help to prevent wet basements. Lawns are wet early in spring and late in fall. Quickly establishing a plant cover and using mulch, temporary diversions, and sediment basins help to control erosion during construction.

(Wd)--Walpole fine sandy loam. This nearly level, poorly drained soil is on stream terraces and outwash plains. Slopes range from 0 to 3 percent. Typically, this Walpole soil has a very dark brown, fine sandy loam surface layer 6 inches thick. The subsoil is dark brown and dark grayish brown, mottled sandy loam 15 inches thick. The substratum is grayish brown and olive brown, mottled loamy sand, sand, and coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Sudbury and Ninigret soils, poorly drained Raypol soils, and very poorly drained Scarboro soils. Many areas have a loamy sand or sand subsoil. Included areas make up about 15 percent of this map unit.

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

This soil is suited to trees. Wetness hinders machine planting when the soil is wet. Woodland roads are wet and soft in the spring and fall. Windthrow is common because of the shallow rooting depth above the high water table.

The major limiting factor for community development is the seasonal high water table. Onsite septic systems need special and often unusual design and installation, and areas commonly require extensive filling. In places, onsite septic systems pollute the ground water. Steep slopes of excavations are unstable. Foundation drains help to prevent wet basements. Lawns are wet and soggy in the fall and spring. Quickly establishing a plant cover and using mulch, temporary diversions, and sediment basins help to control erosion during construction.

#### Sediment and Erosion Control

A detailed sediment and erosion control plan should be prepared for this proposal and submitted to the New London County Soil and Water Conservation District for review. This plan should include the following items as a minimum.

#### A. A narrative describing:

- 1. the development:
- 2. the schedule for grading and construction activities including:
  - a. start and completion dates;
  - sequence of grading and construction activities;
  - c. sequence for installation and/or application of soil erosion and sediment control measures;
  - d. sequence for final stabilization of the project site;
- the design criteria for proposed soil erosion and sediment control measures and storm water management facilities.
- 4. the construction details for proposed soil erosion and sediment control measures and storm water management facilities.
- 5. the installation and/or application procedures for proposed soil erosion and sediment control measures and storm water management facilities.

- 6. the operations maintenance program for proposed soil erosion and sediment control measures and storm water management facilities.
- B. A site plan map at a sufficient scale to show:
  - 1. the location of the proposed development and adjacent properties;
  - the existing and proposed topography including soil types, wetlands, watercourses and water bodies;
  - the existing structures on the project site, if any;
  - 4. the proposed area alterations including cleared, excavated, filled or graded areas and proposed structures, utilities, roads and if applicable, new property lines;
  - 5. the location of and design details for all proposed soil erosion and sediment control measures and storm water management facilities:
  - 6. the sequence of grading and construction activities;
  - 7. the sequence for installation and/or application of soil erosion and sediment control measures;
  - 8. the sequence for final stabilization of the development site.

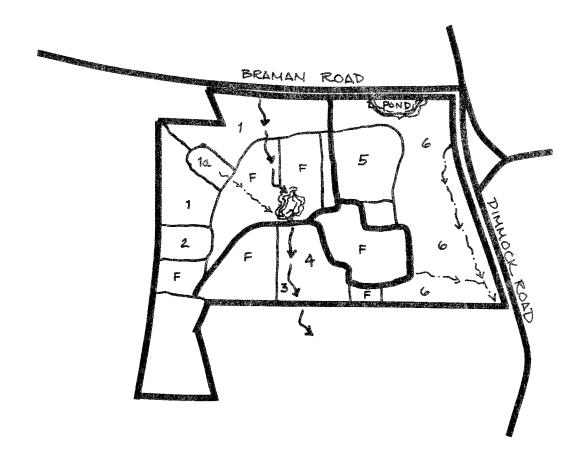
#### **VEGETATION**

Areas noted as "field" are presently in ornamental nursery crops. Apparently plans call for the removal of all these plants before development starts. The remainder of the area is in brushland that is reverting from fields or in woods of mixed hardwood species.

Area #1--This is a stand of mixed hardwoods where the trees in the main canopy are mostly 10 to 14 inches in diameter. Species include black, red, and scarlet oaks, white ash, red maple, black gum, sassafras, black birch and hickories, both pignut and mockernut. The understory has seedlings and saplings of these species, plus spicebush, maple leaf viburnum, bittersweet, bull briar, and catbriar.

Area #1a--This area is similar to Area #1 except it is more moist, so there is more red maple to the mixture, and there is one area near the northwest boundary where bittersweet and briars have taken over to create an area almost devoid of trees. In general, there is more viburnum and spicebush in the understory.

Area #2--The overstory is composed of red maple, black birch, sassafras, black oak and scarlet oak. The average overstory tree is about eight inches in



KEY

VEGETATION TYPE
BOUNDARY

~. -> INTERMITTENT STREAM



POND

F FIELD

DIRT ROAD

diameter. The understory is similar to Area #1, although the area is more dense so there are less tree seedlings. Most of the small plants are shrub species, such as maple leaf viburnum, spicebush, and briars.

Area #3--This is the area just a little higher in elevation than the swampy drainage. The overstory species include black birch, black oak, scarlet oak, white oak, and sassafras. There are both bull briars and catbriars, sassafras and black birch seedlings, and maple leaf viburnum in the understory. Other lesser vegetation was not noticeable in the winter conditions with a snow cover.

Area #4--This area should be considered a woody swamp. The only tree species observed was red maple. The rest of the cover was shrubs and grasses, that included, but was not limited to Tartarian honeysuckle, silky dogwood, blueberry, spicebush, sweet pepperbush, phragmites, and climbing bittersweet. Much of the area was ice covered, indicating that the water table is high and a good part of the area is subjected to seasonal flooding.

Area #5--This area is semi-open with a lot of rock outcropping. There are areas of wild grass with brush and some trees. Tree species include red cedar, scarlet oak, sassafras, black gum and black cherry. For most of the area thse trees are scattered and do not form an overhead canopy. They are pioneer species of the "old field", have poor form and a relatively short life expectancy. Shrubby species include seedlings and saplings of the above trees, plus arrowwood, Tartarian honeysuckle, wild apple, gray dogwood and sumac (smooth and winged).

Area #6--This area has a wide variation of species, but is lumped together as it is all similar in age, stage of development, and ground conditions. The area is generally quite moist with a seasonally high water table and some well-defined surface run-off. Overstory species include white ash, black cherry, sassafras, Norway maple, red maple, sugar maple, a patch of Norway spruce, and a section of black locust. Beside seedlings and saplings of the overstory trees, the understory contains Tartarian honeysuckle, multiflora rose, bayberry, spicebush, sweet pepperbush, and climbing bittersweet everywhere, with a few wild grape vines also to make some really tangled areas.

The impact of intensive development will be to remove another piece of forest land from the production of wood products. The impact of the forest on development of houselots would be best broken down by area: Area #1 will provide lots with minimum ground disturbance (root destruction), most of the trees will survive to provide natural landscaping. Area #2 is rather poorly drained with tree roots near the surface; killing trees by filling or by wind blowdown is a real possibility. Areas #3 and 4 are designated as open-space as it should be, as this is wetland. Area #5 is covered with shrubs and short-lived trees, most of which are not suitable for house-lot landscaping; therefore, it is expected most of this will be removed and landscape planting be implemented. Area #6 will be the most impacted as the high water table combined with tall trees is going to create some blow-down and breakage. Also, the climbing vines are going to be unattractive. Clearing the vines with a bulldozer is going to cause even further damage; much breakage should be expected.

#### FISHERIES CONCERNS

Aquatic resources or the property are limited to a small perennial stream and a irrigation pond through which the stream flows. Plans for development include excavation of the pond and construction of a dike to raise the pond level by 2.5 feet.

As a result of the stream's small size, the pond presently, and in the future, constitutes the primary fishing resource despite its small size and limited depth. Fish expected to inhabit the pond would be sunfish, shiners, bullhead and perhaps a few small native brook trout. Fisheries habitat would improve only marginally with the proposed pond deeping.

The primary effects on fisheries of the proposed development will likely occur in the Goshen cove estuary where changing influx rate and volumes of fresh water could potentially change seasonal salinites of the cove.

#### WATER SUPPLY

Present subdivision plans call for extension of the public water supply into the site to service future homes.

#### WASTE DISPOSAL

Although Waterford has undertaken a recent expansion of public sewers throughout various areas of the town, these facilities terminate approximately one mile from the subject site. Therefore, the proposed development would be served by onsite subsurface sewage disposal systems.

It has been generally recognized and recommended that where lots would have the availability of a public water supply, but will require the use of private sewage disposal facilities a minimum size of one-half acre per lot be allowed. In this regard the proposed lots in the subdivision would meet this criteria.

However, based on visual observations and consideration of Soil Conservation Service mapping data and onsite testing information provided by the developer's engineering firm, it is apparent that not all favorable conditions exit. Some areas will have limitations due to wetlands and high ground water conditions others will be impeded by rock outcrops and the shallowness to underlying ledge. In general, soils tend to be moderately to excesively well drained. One area, however, from about midway on Dimmock Road, southerly, which also has a wetlands area, is apparently poorly drained.

In the upper area along Braman Road on the east side of the entering watercourse, where rock outcrops and/or shallow bedrock is in evidence, there is always a concern for having a sufficiently large, suitable area for sewage disposal installation. In order to accurately determine that such an area, in fact, would be available, a sufficient number of deep test holes are needed on individual lots for ledge profile. For the purposes of sewage disposal, bedrock would need to be at least 4 feet below the bottom area of any leaching system. Because of the likelihood of rock being encountered at varying depths, leaching systems no doubt would need to be kept shallow or spread out over a wider area. The wetland which is present in this area, but not shown on the plans, would also have bearing on available or usable land area on some proposed lots.

For a number of lots which have soils that drain quite rapidly, particularly in the deeper soil layer, high seasonal ground water could be a factor which would need to be overcome in a satisfctory manner. Again, leaching sytems should be kept elevated and spread out. Keeping systems shallow in the upper soil layers should also provide for a greater degree of effluent treatment and renovation.

It is noted that many of the lots are relatively narrow (frontage) and long. Depending on contours and septic system placement, it may be difficult at times to provide necessary lateral leaching are following natural contours while maintaining all required separating distances.

In general, there appears to be at least several lots (#50 and 54) probably several more (5-10% of the total) which should be eliminated or combined with adjacent lots to reduce the density and provide more assurance for proper and satisfactory sewage disposal.

There has also been an ongoing problem in the area with the storage and use of sewage sludge from the New London treatment plant at the adjacent nursery. As future residents in this subdivision will be effected by the odor produced by this agricultural practice, the matter should be resolved promptly.

#### PLANNING CONCERNS

Surrounding land uses are low-density residential to the west and along Braman Road, undeveloped to the north, medium-density residential between Dimmock Road and the New London city line, and a nursery to the south. The New London city line is about one-half mile to the east along Niles Hill Road and the Waterford Civic Triangle area is located about two and one-half miles to the north along Route 156 (Rope Ferry Road).

No existing traffic counts are available for town roads. The nearest state highway is Route 213. The proposed subdivision will access Route 213 to the west along Braman Road, to the south along Dimmock and Lloyd Roads and to the east along Niles Hill Road. The 1982 DOT traffic log indicated an average daily traffic count of 5,700 vehicles on Route 213 in the vicinity of the intersection with Braman Road, 1,300 vehicles on Route 213 in the vicinity of

Dimmock and Lloyd Roads and 1,600 vehicles at the intersection with Niles Hill Road. CONNDOT's data indicate the following items for Route 213:

Location	Volume/Capacity ratio	<u>Peak Hour</u> <u>Volume</u>	Road Capacity Per Hour
Braman and 213	0.4030	806	2,000
Dimmock, Lloyd and 213	0.1204	195	1,620
Niles Hill and 213	0.1605	260	1,620

A volume capacity ratio of 0.75 is considered congested and 1.25 is considered the intolerable threshold, so the road is well below the problem traffic levels.

Fifty-six single-family homes are scheduled to be constructed under this proposal. Data published by CONNDOT\* indicate that a residential subdivision can be expected to generate 10.6 weekday trips per unit with an evening peak of 10.1% of average daily traffic. This will result in 594 more daily trips with an evening peak of 60 trips. The addition of this evening peak hour of 60 trips to any of the current peak hours on Route 213 referred to above results in a new peak-hour volume which is still well below any of the capacities shown above.

No improvements for any state or local roads in this area of Waterford are scheduled in the 1983 Regional Transportation Plan. The proposed intersection of Irving Drive with Dimmock Road should be at the same level as Dimmock Road to improve sight lines. Since the intersection of Irving Drive and Braman Road will be on a vertical curve, it would be desirable to remove some of the trees at this location to assure better sight lines.

<sup>\*</sup>Trip Generation Study of Various Land Uses, Supplement A, by Israel Zevin, Connecticut Department of Transportation, 1975.

## About the Team

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

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

#### PURPOSE OF THE TEAM

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

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

#### REQUESTING A REVIEW

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

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.