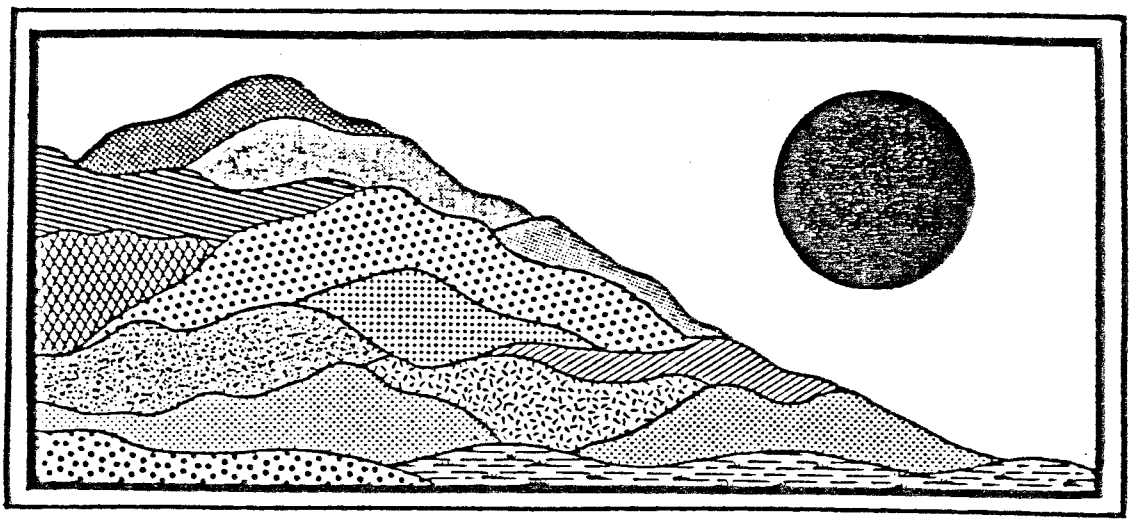
Salem Meadows

Salem, Connecticut

June 1988



ENVIRONMENTAL REVIEW TEAM REPORT

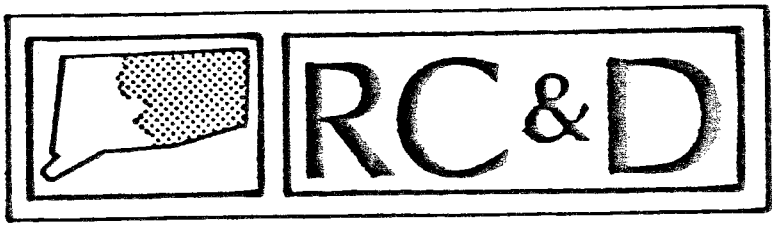
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Salem Meadows

Salem, Connecticut

Review Date: MARCH 24, 1988

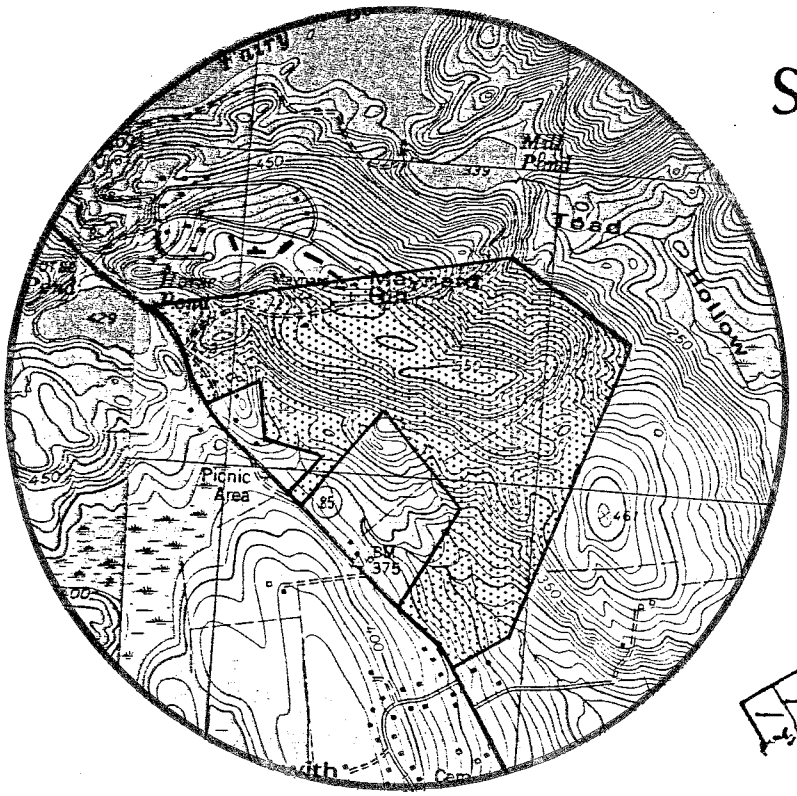
Report Date: JUNE 1988

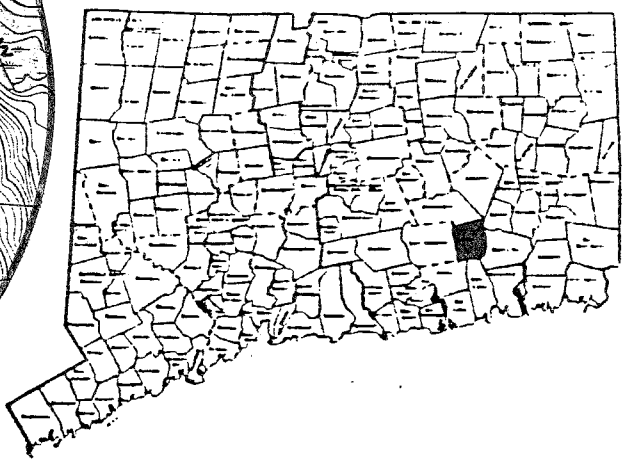


ENVIRONMENTAL REVIEW TEAM
PO BOX 198
BROOKLYN, CONNECTICUT 06234

Site Location

SALEM MEADOWS SUBDIVISION
SALEM, CONNECTICUT





EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT
ON
SALEM MEADOWS SUBDIVISION
SALEM, CONNECTICUT

This report is an outgrowth of a request from the Salem Planning and Zoning Commission to the New London 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 Council 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, March 24, 1988. Team members participating on this review included:

Don Capellaro	--Sanitarian - CT Department of Health
Liz Rogers	--Soil Conservationist - U.S.D.A., Soil Conservation Service
Tom Seidel	--Regional Planner - Southeastern CT Regional Planning Agency
Elaine Sych	--ERT Coordinator - Eastern CT RC&D Area
Bill Warzecha	--Geologist - DEP, Natural Resources Center

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

This report represents the Team's findings. It is not meant to compete with private consultants by providing 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 Executive Committee hopes you will find this report of value and assistance in making your decisions on this proposed subdivisdion.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P. O. Box 198
Brooklyn, CT 06234
(203) 774-1253

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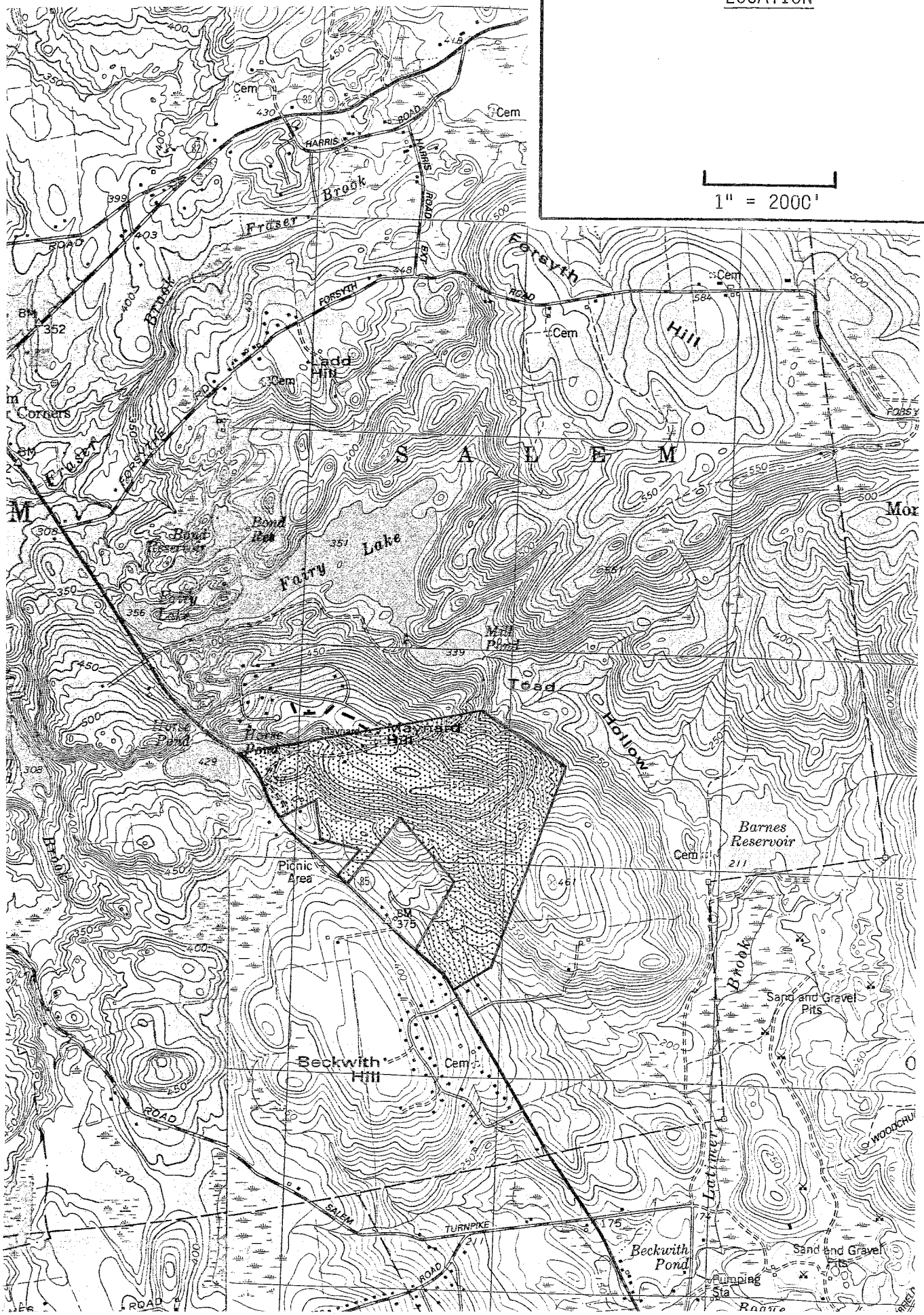
LOCATION

1" = 2000'



1. INTRODUCTION

The Eastern Connecticut Environmental Review Team has been asked to review the preliminary plans for the Salem Meadows Subdivision. Because the plans were very preliminary in nature this report contains general natural resource information, comments and recommendations concerning the proposed development. At a later date when plans become more finalized or change substantially from those reviewed, the Town may want to request further Environmental Review Team assistance.

The parcel of some ±208 acres is located on the east side of Route 85 adjoining the former Fairy Lake Apartment complex property at the north. The site has a roadway near the lower north corner which leads into the property. There are two existing dwellings, one of which is occupied and is presently privately owned. The other larger structure is vacant. There is a large open field area near the north boundary line and about midway up along that side. The remaining acreage is wooded, and a considerable portion is steeply sloping with some areas of rock outcrops and boulders. Also, there is a large area of wetlands toward the west side of the parcel with several lesser areas along the southern property line. Defined watercourses drain the wetlands with outflow going toward the east and southeast eventually becoming a part of the reservoir system of the New London public water supply.

A preliminary subdivision plan by the applicant's engineers, McDonald/Sharpe & Associates, indicates a possible layout of 64 lots with each lot being a minimum of 80,000 square feet. In conjunction with roadway development, the main road in would split at the open field and run in two parallel roads of different lengths and ending in cul-de-sacs. A minimum number of lots would actually be located on Route 85. The lower portion of the property (towards west) would be developed around a parcel having an existing plant and garden center.

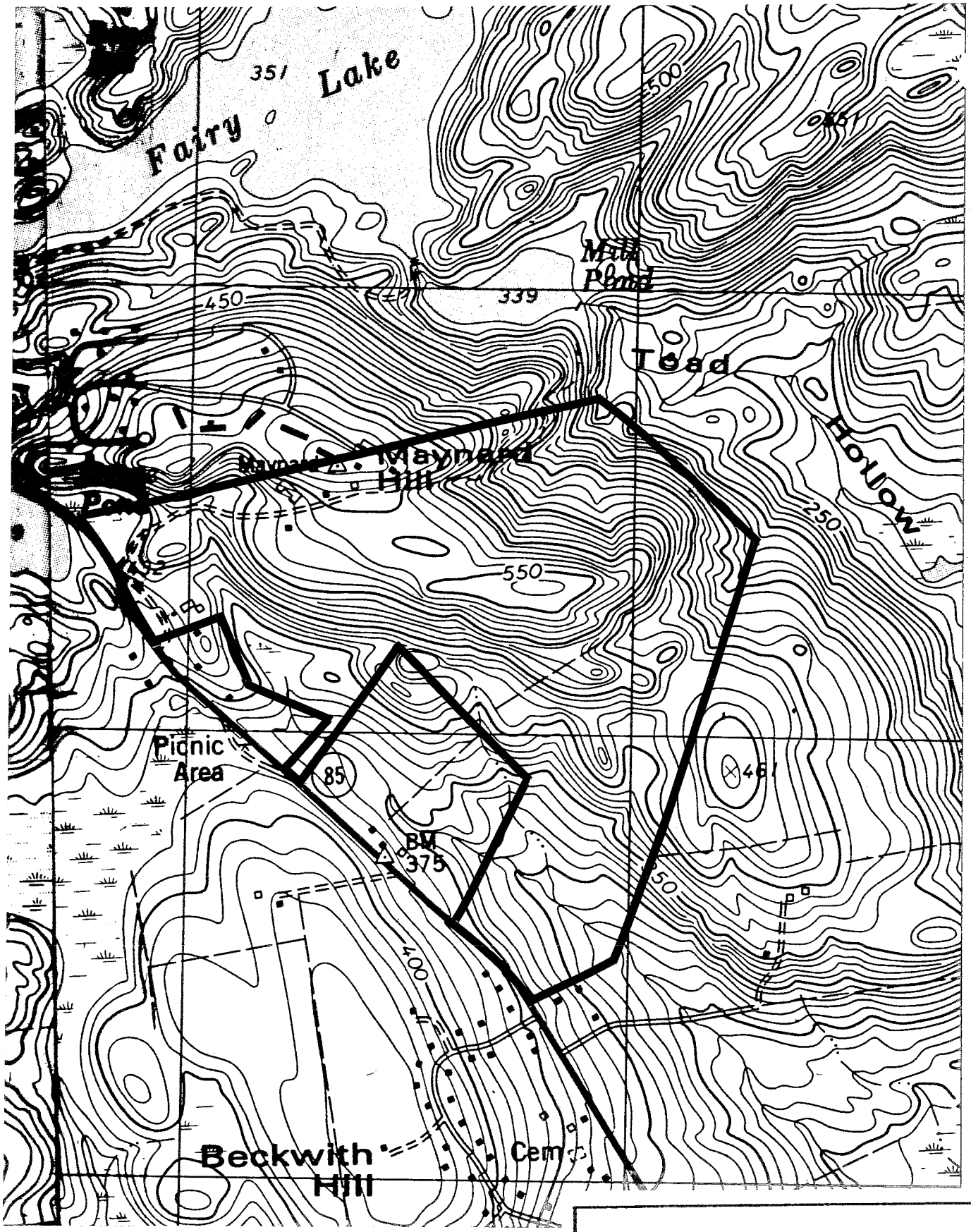
2. SETTING AND TOPOGRAPHY

The site, about 208 acres in size, is located in the southeast corner of Salem. The site abuts Route 85 to the west, several single family and multi-family residential properties to the north and undeveloped land to the east and south. Except for about 7 acres of the site along Route 85 in the western part, the site lies within a public water supply watershed (City of New London). Public water supply lands (City of New London) border the site on the northeast.

The proposed 64 lot subdivision site is located in a RU-A zone. Permitted uses of the land include residential development at a minimum lot size of 80,000 square feet. Land use in the area consists of single and multi-family residential buildings, as well as scattered commercial development which are mainly along Route 85. Town zoning regulations require the septic systems and structures be set back 50 feet and 25 feet respectively, from regulated wetland soils.

The site encompasses Maynard Hill. Except for a large open field that occupies the tableland of the hill, the site is entirely wooded. The presence of stonewalls transecting the site and stone piles are indicative of the land's agricultural past.

Slopes within the site range from gentle on top of Maynard Hill to steep slopes flanking the north and south sides of the hill. The underlying bedrock controls the topographic condition on the site. Six lots (59--64) will be accessed from Route 85 via individual driveways, the remainder from an interior road system. Each lot will be serviced by individual on-site wells and septic systems.



TOPOGRAPHY

Approximate Site Boundary

1" = 1000'

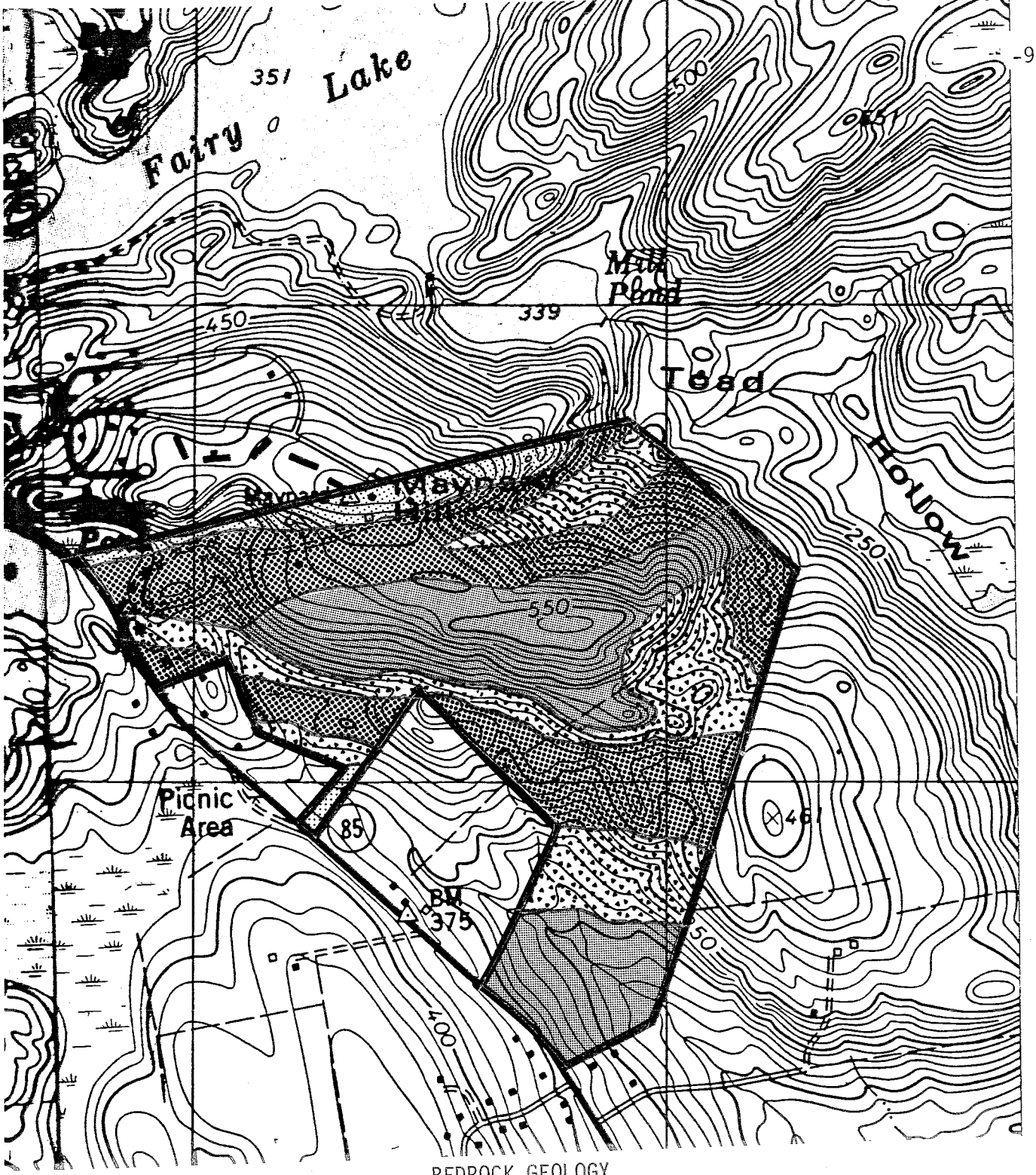
3. GEOLOGY

The site lies entirely within the Montville topographic quadrangle. A bedrock geologic map (GQ-609, by R. Goldsmith) and a surficial geologic map (GQ-148, by R. Goldsmith) for the quadrangle have been published by the U. S. Geological Survey. In addition, the Team's Geologist referenced John Rodgers' **Bedrock Geological Map of Connecticut** and the **Soil Survey for New London County** for this section of the report.

Bedrock in the vicinity of the site consists primarily of complex, crystalline metamorphic rocks. The rocks, which are from the Proterozoic Era (more than 1,100 million years ago), have been subjected to the heat and pressure of mountain building (metamorphism). They are greatly changed since their deposition as mud, silt, sand or volcanic material. Foliation (layering of minerals) has developed as micas, and other platy minerals grew along preferred directions in response to heat and pressure. The resulting metamorphic rocks are schists, gneisses, quartzites and amphibolites. "Gneisses" are characterized by light and dark colored minerals arranged in layers with a banded, streaky or speckled appearance. "Quartzites" are typically a compact, hard rock with a quartz content greater than 90%. It has a sugary texture. "Schists" are generally cleavable rocks with layers defined by parallel arrangement of platy or flaky minerals. Finally, "amphibolites" are dark, metamorphic rocks, chiefly composed of hornblende and plagioclase feldspar.

From a regional standpoint, the site is located within the Montville Dome, an area of uplifted bedrock. As a result of this past geologic activity, it is expected that the upper few hundred feet of bedrock is fractured. (See **Water Supply Section**). Of the limited subsurface exploration for subsurface sewage disposal conducted on the open fields, bedrock was encountered at depths ranging from about 4.5 feet to almost 8 feet below ground. Bedrock within the site ranges from zero where it is exposed at ground surface to probably not much more than 10 feet. A band of exposed bedrock (outcrops) traverses the site in an east-west direction. The underlying bedrock will be the major source of water to domestic wells installed in the subdivision.

Deep test hole information supplied to Team members, surficial geologic and soil mapping data indicates that the unconsolidated materials overlying bedrock consist of glacial till. It was plastered onto the metamorphic bedrock underlying the site by moving glacial ice. Till consists of ground up rock material which may range in size from clay to boulders or any combination of these intermediate sizes. Because the ice moved the particles without regard to their sizes or shapes, till textures may be locally quite variable. Two types of till have been identified in Connecticut. One is fairly loose and sandy, while the other is typically silty, crudely layered and compact. Based on soils mapping information supplied to Team members, it appears that the sandier, looser variety of till covers most of the site. However, subsurface exploration information, generally restricted to the open field within the site, indicates the presence of a "firm" or "compact" soil zone about 2.5 to 3.5 feet below ground surface. It seems likely that these zones could impede the downward movement of water resulting in a seasonally high water table especially during the wet months of the year.



BEDROCK GEOLOGY

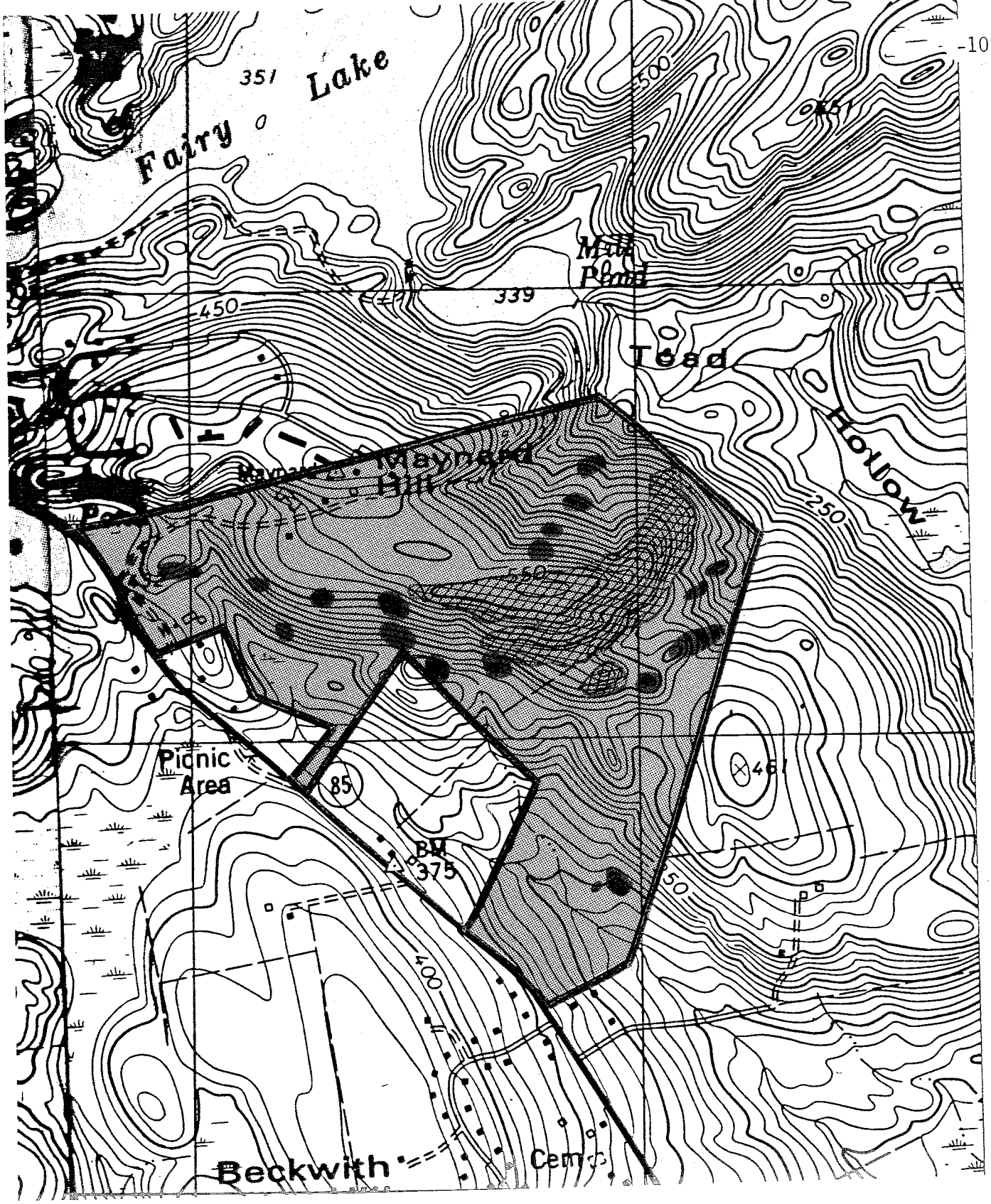
Hope Valley Alaskite Gneiss (light pink to gray, medium to coarse-grained granitic gneiss)

Plainfield Formation (interlayered, thinly bedded quartzite, mica schist and dark gray gneiss)

Plainfield Formation (quartzite)

Biotite granitic gneiss

Scale 1" = 1000'



SURFICIAL GEOLOGY

Till

Bedrock outcrops

Areas where bedrock is at or near ground surface

Scale 1" = 1000'

As noted on the subdivision plan submitted to Team members, the major inland-wetland area on the site is delineated along this unnamed streamcourse in the western part. Also, there are several small wetland pockets scattered along the southern border. The soils comprising these areas range from poorly to very poorly drained and are found mainly in drainageways and depressionals features on the upland till soils, respectively.

Because seasonally high water tables and frequent flooding (mid-November to mid-April and following major storm events) characterize these areas, they hold very low potential for develoment purposes.

It seems that the flood control attributes and sediment retention capabilities of the wetlands are good. The best areas are those which have gradients that are flat and relatively wide. The drainageways, which have steep gradients serve as conduits for surface runoff to adjacent, larger streamcourses or wetland areas.

All areas identified as wetland soils are considered "regulated areas" under Chapter 440 of the Connecticut General Statutes. Any proposed activity such as grading, filling or modifications that impacts regulated areas are subject to approval by the Salem Inland Wetland Commission. In reviewing a proposal, the Commission needs to determine the impact that the proposed activity will have on the wetland. If the Commission feels that the regulated areas are serving an important hydrologic or ecologic function and that the impact of the proposed activity will be severe, they may deny the activity altogether, or at least require measures that would minimize the impact.

Present plans indicate that wetland activities include a narrow road crossing of wetland soils between Lot 56 and 2 and the potential construction of driveways over wetland soils on Lots 36--38, 46 and 47. Although an existing driveway traverses the wetlands crossing between Lots 56 and 2, it appears that road fill material may extend into the regulated area. Once plans become more definite, i.e., road and driveway layout, it is suggested that fill lines be shown on the subdivision plans and the volume of fill to be placed over regulated soils be quantified. This will greatly help land-use decision makers in Town in reviewing the proposed project. The U.S. Army Corps of Engineers should be contacted if more than one acre of wetland is impacted, as they may require a permit.

4. HYDROLOGY

The site can be subdivided into three subdrainage areas. Drainage runoff from the eastern-most limits of the site flows downslope via seasonal drainageways to Toad Hollow. The drainageways act as conduits for surface water. Toad Hollow flows into Barnes Reservoir, a city of New London public water supply reservoir. Except for seven acres at the northwest corner, the remainder of the site flows to the major streamcourse which is unnamed and flows in a southerly direction through the western part. The streamcourse is tributary to Latimer Brook. Drainage runoff from the seven acres flows under Route 85 into Horse Pond whose outlet is a tributary to Shingle Mill Pond. Generally speaking, groundwater flow on the site presently reflects the surface waterflow.

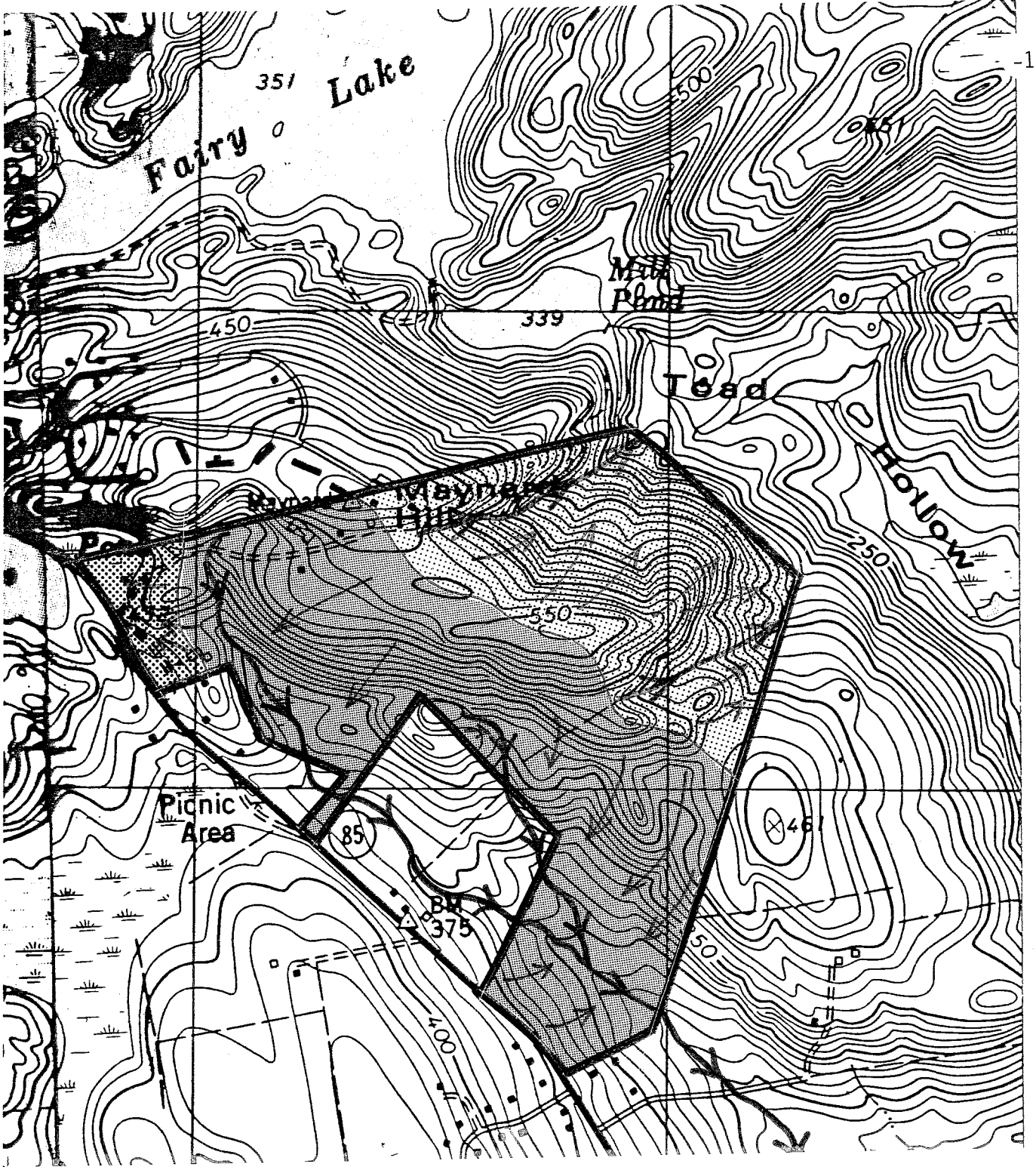
According to DEP, groundwater for all of the proposed subdivision site, except for the portion that drains to Horse Pond, is classified as GAA. This means that groundwaters are within a public water supply watershed (City of New London), and is presumed suitable for direct human consumption. The State's goal is to maintain that condition by banning almost all discharges to groundwater. Groundwater within the seven acre portion is classified as GA, which means it is within the area of influence of private and potential public water supply wells. It is also presumed to be suitable for direct human consumption. Like the GAA areas, certain discharges to the groundwater may be restricted.

Surface water quality for the GAA areas noted above are classified as Class AA, which means that they are existing or proposed public drinking water supply impoundments and/or tributary surface waters.

Development of the site under present plans would be expected to cause some increases in the amount of runoff shed from the site. These increases would arise mainly from the creation of impervious surfaces such as roof tops, driveways, patios, or interior road systems over otherwise pervious soils. Detailed hydrologic calculations for the proposed subdivision have not been prepared to date. A careful stormwater management plan which includes pre- and post-development runoff calculations should therefore be required by the Town prior to subdivision approval. Design specifications for all stormwater control facilities and erosion control devices should be included on the subdivision plan for review by appropriate Town officials.

The major concerns are increased runoff including flooding and the potential for streambank erosion. Although both are of concern with regard to the proposed project, it seems likely that the latter would be of most concern, especially in view of the very steep slopes present on the site and the presence of silty soils. The biggest concern, however, with regard to the latter is the fact that most of the site is located within a public water supply reservoir watershed.

It seems likely that the existing high surface water quality for the site may be affected by the project. For this reason, it is most important that a sound erosion and sediment control plan be prepared, implemented and enforced. To give an example: if uncontrolled activity occurs on the site during construction periods, surface waters in this area could probably pick up significant amounts of suspended and dissolved solids and transmit them to the streamcourses. This may result



WATERSHED BOUNDARY

Land area that drains to Toad Hollow and ultimately Barnes Reservoir

Land area that drains to an unnamed tributary to Latimer Brook

Land area that drains under Route 85 and to Horse Pond

Major streamcourses showing direction of flow

Surface runoff showing direction of flow

Scale 1" = 1000'

in strong coloration, as well as a substantial increase in turbidity in the streamcourses and downstream surface water bodies. Also, after the project is completed, it seems likely that steep road and driveway grades will require heavy sand and salt application during winter months. Although most of the sand should be trapped in catch basins or sediment basins, salt and other dissolved materials and some suspended particles probably will be transmitted into the streamcourses. As a result, it is strongly suggested that the local health department and the City of New London Water Department be contacted regarding the proposed subdivision as soon as possible. Below is a copy of Section 19-13-B32. Sanitation of watersheds of the State Public Health Code, which regulates activity to land and watercourses tributary to a public water supply including both surface and groundwaters. With respect to the proposed subdivision, it appears that all sections would be of concern and need to be addressed with respect to the project. In order to ensure that water quality to the stream is maintained at the highest quality, the town needs to coordinate the stormwater management plan for the subdivision closely with DEP Water Compliance, local health department and representatives from the City of New London Water Department.

SANITATION OF WATERSHEDS

Sec. 19-13-B32. Sanitation of Watersheds. Unless specifically limited, the following regulations apply to land and watercourses tributary to a public water supply including both surface and ground water sources.

(a) As used in this section, "sewage" shall have the meaning found in section 19-12-B20(a) of the public health code: "Toxic metals" shall be arsenic, barium, cadmium, chromium, lead, mercury and silver and the salts thereof; "high water mark" shoal be the upper limit and any land area which water may cover, either standing or flowing, at any time during the year and "watershed" shall mean land which drains by natural or man-made causes to a public drinking water supply intake.

(b) No sewage disposal system, cesspool, privy or other place for the deposit or storage of sewage shall be located within one hundred feet of the high water mark of any reservoir or within fifty feet of the high water mark of any stream, brook, or watercourse, flowing into any reservoir used for drinking purposes.

(c) No sewage disposal system, cesspool, privy or other place for the deposit or storage of sewage shall be located on any watershed, unless such facility is so constructed that no portion of the contents can escape or be washed into the stream or reservoir.

(d) No sewage shall be discharged on the surface of the ground on any watershed.

(e) No stable, pigpen, chicken house or other structure where the excrement of animals or fowls is allowed to accumulate shall be located within one hundred feet of the high water mark of a reservoir or within fifty feet of the high water mark of any watercourse as above mentioned, and no such structure shall be located on any watershed unless provision is made in a manner acceptable to the commissioner of health services for preventing manure or other polluting materials from flowing or being washed into such waters.

(f) No toxic metals, gasoline, oil or any pesticide shall be disposed of as a waste into any watercourse tributary to a public drinking water supply or to any ground water identified as supplying a public water supply well.

(g) Where fertilizer is identified as a significant contributing factor to nitrate nitrogen occurring in excess of 8 mg/l in a public water supply, fertilizer application shall be made only under current guidelines established by the commissioner of health in cooperation with the state commissioner of agriculture, the college of agriculture of the University of Connecticut and the Connecticut agricultural experiment station in order to prevent exceeding the maximum allowable limit in public drinking water of 10.0 mg/l for nitrite plus nitrate nitrogen.

(h) Where sodium occurs in excess of 15 mg/l in a public drinking water supply, no sodium chloride shall be used for maintenance of roads, driveways, or parking areas draining to

that water supply except under application rates approved by the commissioner of health, designed to prevent the sodium content of the public drinking water from exceeding 20 mg/l.

(i) The design of storm water drainage facilities shall be such as to minimize soil erosion and maximize absorption of pollutants by the soil. Storm water drain pipes, except for crossing culverts, shall terminate at least 100 feet from the edge of an established watercourse unless such termination is impractical, the discharge arrangement is so constructed as to dissipate the flow energy in a way that it will minimize the possibility of soil erosion, and the commissioner of health finds that a discharge at a lesser distance is advantageous to stream quality. Special precautions shall be taken to protect stream quality during construction.

5. WATER SUPPLY

As mentioned earlier,the underlying bedrock appears to be the most suitable aquifer to serve the proposed 64 individual water supply wells. Obtaining water from any given bedrock well is dependent upon the number and size of water transmitting fractures that are encountered by the well. The metamorphic rocks underlying the site respond to geologic forces by fracturing and forming distinct open joints. If the underlying rock contains continuous and interconnected fractures and joints, then the availability of groundwater for domestic uses should be good. In the Lower Thames and Southeastern Coastal River Basin, a large number of wells (2,000) were surveyed for Connecticut Water Resources Bulletin No. 15. Of all those wells surveyed that tapped a type of bedrock similar in physical characteristics to the bedrock underlying the site, 90 percent yielded 3 gallons per minute or more. In most cases rock wells will yield sufficient water to provide for normal domestic uses. In cases where yields tend to be quite low (1-2 gpm) added water storage capacity can be provided by increasing well depth and also by use of larger pressure/storage tanks.

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

In general, wells should be located toward the high side of lots in a direction away from the normal expected flow of groundwater from any source of subsurface pollution. They must be properly separated from on-site sewage disposal systems and other potential sources of pollution which could affect the safety and quality of the water. In housing developments,in addition to sewage, particular concern must be given for any buried fuel storage tanks and on-site disposal for any waste water associated with water softening equipment utilizing salt.

Properly constructed drilled wells generally afford the greatest degree of protection against possible sources of pollution. They will usually allow for more flexibility in actual site placement. All types of wells are to be constructed by persons who are state licensed for this profession. Proposed well sites should be inspected by the Town sanitarian or appropriate sanitation official before the issuance of a permit of approval to actually construct such wells. The sanitation or health official must generally insure that provisions of the State Public Health Code, State Well Drilling Board and local ordinances have been followed.

The natural quality of groundwater should be safe and satisfactory. However, in many locations certain rock formations alter the quality of water coming in contact with such. Two of the most common components produce elevated levels of iron and/or manganese which may affect water quality. As a result it may be necessary to install appropriate water treatment systems in order to reduce concentrations to non-objectionable levels.

6. GEOLOGIC DEVELOPMENT CONCERNS

As mentioned earlier, the proposed subdivision will rely on individual on-site wells and septic systems. For the purpose of this report, the major geologic limitations on the site with respect to the proposed development include the following: (1) areas of shallow bedrock conditions and continuous outcroppings of ledgerock which occur mainly across the central parts (east to west) of the site; (2) the presence of moderate to very steep slopes, which are associated with the ledgerock outcrop areas on the site; (3) several lots, which contain a high percentage of regulated inland-wetland soils and (4) the presence of some soils that have seasonally elevated water tables and moderately slow percolation rates, mainly the upland soils that flank wetland soils along the major watercourses on the site and those that are in close proximity to mapped wetlands.

The geologic limitations mentioned above clearly indicate that most on-site septic systems serving the proposed lots will require detailed engineering design plans. Because of the likelihood of shallow bedrock conditions and water tables, it is highly probable that shallow leaching trench systems will be utilized on most lots. It seems likely that groundwater intercepting drains will need to be incorporated on those lots with seasonally high water tables, also proper fill material may be needed in areas of shallow bedrock and compact till to ensure proper separating distances. Since limited subsurface exploration has taken place only in the open field area, additional deep test holes and percolation tests will need to be performed on each of the proposed lots with respect to subdivision approval as well as individual designs of sewage disposal systems. In areas of shallow bedrock, it is not uncommon to excavate several deep test pits in order to determine a profile of the bedrock surface. Careful planning needs to take place in the shallow to bedrock areas to ensure that sewage does not leak into the bedrock, especially since the proposed homes will rely on individual bedrock wells. In this regard, it might be helpful to Town officials if continuous ledgerock exposures were identified on the subdivision plan.

Additional soil testing needs to be conducted on the remainder of the site before an accurate assessment of the soil's ability to handle wastewater discharges can be made. A cursory review of soil mapping data and visual observations made during the field walk indicates that a number of lots along the lower cul-de-sac appear to be unfavorable for development due to shallow bedrock conditions, ledgerock outcroppings and steep slopes. It seems likely that some of these lots are unsuitable for development or that the costs to prepare them for development greatly exceed the benefits. The presence of some overflowing septic systems serving single family and multi-family homes north of the property on the review day, clearly indicate the difficulty of the area for construction of on-site septic systems.

Final determination of total lot layout should be based on more testing and overall site evaluation in order to have reasonable assurance of the availability of a suitable and sufficient size area for sewage disposal purposes on each designated lot.

Based on present plans, it appears that the geologic limitations mentioned earlier would also be a hindrance, in terms of road and and driveway construction and placement of house foundations, particularly in the shallow to bedrock and steeply sloping areas.

The subdivision plan indicates that a great deal of reshaping, regrading and filling in shallow to bedrock areas (central parts-east to west) will probably be required. As a result, blasting will be necessary. If proper precautions are not taken, there is a chance that blasting could lead to;

(1) Increased turbidity levels in surface water and groundwater at least in the immediate vicinity of activity. Because most of the site is located in a public water supply watershed, this concern warrants close examination.

(2) Increase or decrease the number of fractures or openings in the solid bedrock at least in the immediate vicinity, which may or may not impact nearby wells which rely on the underlying bedrock as a water source.

(3) Possibly cause damage to nearby structures and foundations.

In regard to the possibility of damage, a pre-blast survey of surrounding properties should probably be considered to reduce the chance for unwarranted damage claims. Any blasting activity which takes place on the site should be under the strict supervision of persons experienced with state-of-the-art blasting techniques. This should reduce the chance of unnecessary seismic shock or possible damage claims.

Considering the distribution of wetlands on the site, it appears that the applicant's technical staff have chosen the most appropriate locations for disturbance. Once plans become more complete, Town officials should take a close look at those lots whose driveways need to cross wetlands. There may be an alternate route available which would not require wetland crossings. Although undesirable, wetland road/driveway crossings are feasible, provided they are properly engineered. The road/driveway should be constructed adequately above surface elvation of the wetlands. This will allow for better drainage of the road/driveway and also decrease the frost heaving potential of the road. All unstable material should be replaced by proper road base fill. Ideally, road construction through the wetlands should be done at a dry time of the year. The proposed wetland crossings are in locations where erosion control efforts will be paramount so that the wetland/watercourse system is adequately protected from silt. Wetland fill lines should be clearly shown on the subdivision plan so that areas of disturbance are clearly delineated. Also, the amount of fill material should be determined and this information made available to Commission members. Finally, culverts should be properly sized and located so as not to alter the water levels in the wetlands or cause flooding.

7. EROSION AND SEDIMENT CONTROL

The developer's proposal was general in nature. When a detailed plan is submitted, it will be necessary to include an erosion and sediment control plan containing the following information:

A. A narrative describing:

1) the development
2) the schedule for grading and construction activities including:

a. start and completion dates
b. sequence of grading and construction activities
c. sequence for installation and for application of soil erosion and sediment control measures
d. sequence for final stabilization of the project site

3) the design criteria for proposed soil erosion and sediment control measures and stormwater management facilities
4) the construction details for proposed soil erosion and sediment control measures and stormwater management facilities
5) the installation and/or application procedures for proposed soil erosion and sediment control measures and stormwater management facilities

B. A site plan map at a sufficient scale to show:

1) the location of the proposed development and adjacent properties
2) the existing and proposed topography, including soil types, wetlands, watercourses and water bodies
3) the existing structures on the project site
4) the proposed area alternatives including cleared, excavated, filled or graded areas and proposed structuress, utilities, roads, etc.

When the erosion and sediment control plan is completed the Soil Conservation Service, working through the New London County Soil and Water Conservation District, will be available to review the plan at the Town's request.

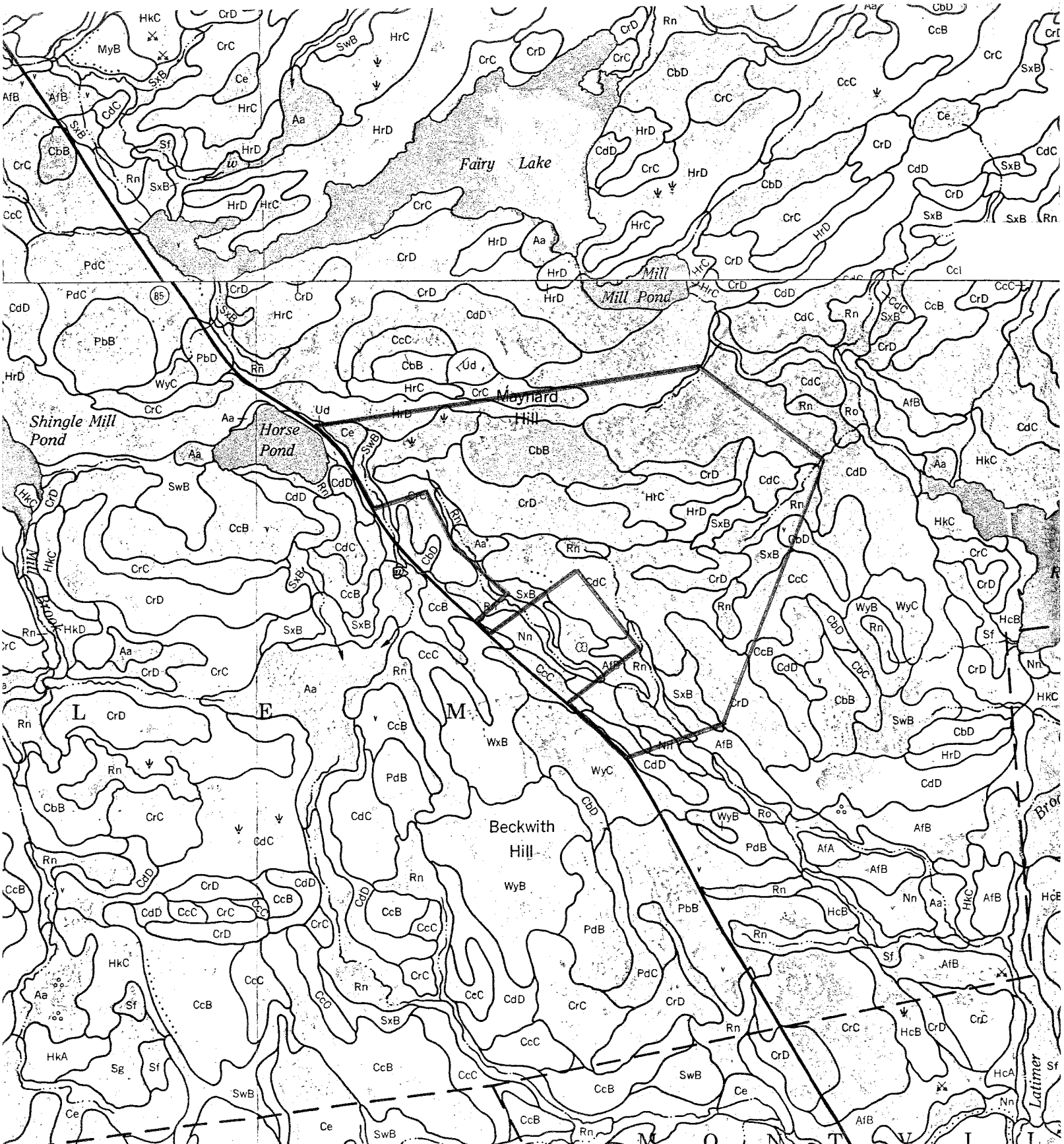
United States Department of Agriculture

Soil Conservation Service

New London USDA-SCS
562 New London Turnpike
Norwich, CT 06360
887-4163

Scale 1"=1320'

Approximate Site Boundary



LIMITATIONS CHART FOR BUILDING SITE DEVELOPMENT

Soil name and map symbol	Dwellings without basements	Dwellings with basements	Local roads and streets	Lawns and landscaping	Septic tank absorption field
*Aa -					
Adrian	Severe: ponding, low strength	Severe: ponding	Severe: ponding, low strength, frost action	Severe: excess humus, ponding	Severe: ponding, poor filter
Palms	Severe: ponding low strength	Severe: ponding	Severe: ponding frost action, low strength	Severe: ponding, excess humus	Severe: ponding
#AfB -					
Agawam	Slight	Slight	Slight	Slight	Severe: poor filter
#CbB -					
Canton	Slight	Slight	Slight	Slight	Slight
Charlton	Slight	Slight	Slight	Slight	Slight
CbD -					
Canton	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Charlton	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
CcC -					
Canton	Moderate: slope	Moderate: slope	Moderate: slope	Moderate: slope, large stones	Moderate: slope
Charlton	Moderate: slope	Moderate: slope	Moderate: slope	Moderate: slope, large stones	Moderate: slope
CdC -					
Canton	Moderate: slope	Moderate: slope	Moderate: slope	Moderate: slope, large stones	Moderate: slope
Charlton	Moderate: slope	Moderate: slope	Moderate: slope	Moderate: slope, large stones	Moderate: slope
CdD -					
Canton	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Charlton	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Ce -					
Carlisle	Severe: ponding, low strength	Severe: ponding, low strength	Severe: ponding, low strength, frost action	Severe: ponding, excess humus	Severe: ponding
CrC -					
Charlton	Moderate: slope	Moderate: slope	Moderate: slope	Moderate: slope, large stones	Moderate: slope
Hollis	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: thin layer	Severe: depth to rock
CrD -					
Charlton	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Hollis	Severe: slope, depth to rock	Severe: slope, depth to rock	Severe: slope, depth to rock	Severe: slope, thin layer	Severe: slope, depth to rock
HrC -					
Hollis	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: thin layer	Severe: depth to rock
Charlton	Moderate: slope	Moderate: slope	Moderate: slope	Moderate: slope, large stones	Moderate: slope
Rock Outcrop					

HrD -					
Hollis	Severe: slope, depth to rock	Severe: slope, depth to rock	Severe: slope, depth to rock	Severe: slope, thin layer	Severe: slope, depth to rock
Charlton	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Rock Outcrop					
#Nn -					
Ninigret	Moderate: wetness	Severe: wetness	Moderate: frost action, wetness	Moderate: wetness	Severe: wetness, poor filter
*Rn -					
Ridgebury	Severe: wetness	Severe: wetness	Severe: wetness, frost action	Severe: wetness	Severe: percs slowly, wetness
Leicester	Severe: wetness	Severe: wetness	Severe: wetness, frost action	Severe: wetness	Severe: wetness
Whitman	Severe: ponding	Severe: ponding	Severe: frost action, ponding	Severe: ponding	Severe: percs slowly, ponding
SwB -					
Sutton	Moderate: wetness	Severe: wetness	Moderate: frost action, wetness	Moderate: large stones, wetness	Severe: wetness
SxB -					
Sutton	Moderate: wetness	Severe: wetness	Moderate: frost action, wetness	Moderate: wetness, large stones	Severe: wetness

*Designated wetland soils regulated under P.A. 155
#Map units that qualify as Prime Farmland

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. 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. 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 capicity is high. Runoff is very slow or ponded. Adrian soils are stronly 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 substatum. The available water capacity is high. Runoff is very slow or ponded. Palms soils are strongly acid through slightly acid. Under P.A. 155 this is a designated wetland soil.

AfB - Agawam fine sandy loam, 3 to 8 percent slopes

This gently sloping, well drained soil is on stream terraces and outwash plains. Permiability of the Agawam 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. Unless limed, the soil is strongly acid or medium acid. This soil is well suited to cultivated crops. This soil is in capability subclass IIe.

CbB-Canton and Charlton fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on glacial till upland hills, plains, and ridges. Typically, the Canton soil has a very dark grayish brown, fine sandy loam surface layer 8 inches thick. The subsoil is dark yellowish brown fine sandy loam and sandy loam 16 inches thick. The substratum is grayish brown gravelly sand to a depth of 60 inches or more. Typically, the Charlton soil has a very dark grayish brown, fine sandy loam surface layer 8 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 21 inches thick. The substratum is grayish brown fine sandy loam to a depth of 60 inches or more. 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. 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. These soils are in capability subclass IIe.

CbD-Canton and Charlton fine sandy loams, 15 to 25 Percent slopes

These moderately steep well drained soils are on glacial till upland hills, plains, and ridges. 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 very rapid. This soil warms up and dries out rapidly in the spring. Unless limed, 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 very rapid. This soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

These soils are poorly suited to cultivated crops. The steepness of slope makes the use of farming equipment difficult. These soils are in capability subclass IVe.

CcC - Canton & Charlton very stony,
fine sancy loams, 8 to 15 percent slope

These sloping, well-drained soils are on glacial till, upland hills, plains and ridges. Stones and boulders cover 1 to 8 percent of the surface.

Typically, the Canton soil has a black, fine sandy loam surface layer 1 inch thick. The subsoil is dark yellowish-brown, fine sandy loam and sandy loam 23 inches thick. The substratum is grayish-brown gravelly sand to a depth of 60 inches or more.

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.

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 rapid. The soil warms up and dries out rapidly in the spring.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate, runoff is rapid. The soil warms up and dries out rapidly in the spring.

These soils are in capability subclass VIs.

CdC-Canton and Charlton extremely stony fine sandy loams
3 to 15 percent slopes

These gently sloping and sloping, well drained soils are on glacial till upland hills, plains, and ridges. 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. 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 or rapid. The Canton soil warms up and dries out rapidly in the spring. It 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 or rapid. The Charlton 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 impractical. These soils are in capability subclass VIIs.

CdD-Canton and Charlton extremely stony fine sandy loams,
15 to 35 percent slopes

These moderately steep to steep, well drained soils are on glacial till upland hills, plains, and ridges. Stones and boulders cover 8 to 25 percent of the surface. 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 very rapid. The Canton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

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

These soils are not suited tocultivated crops. Stones and boulders make the use of farm equipment impractical. The hazard of erosion is severe. These soils are in capability subclass VIIs.

Ce-Carlisle muck

This nearly level, very poorly drained soil is in pockets and depressions of flood plains, stream terraces, outwash plains, and glacial till uplands. Slopes range from 0 to 2 percent. The Carlisle soil has a high water table near or above the surface for most of the year. Permeability is moderately rapid. The available water capacity is high. Runoff is very slow. The soil is strongly acid through slightly acid. This soil is not suited to cultivated crops because of wetness. This soil is in capability subclass VIw.

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. 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 not suited to cultivated crops. Stoniness and rock outcrops generally make the use of farming equipment impractical. The Hollis soil has a shallow rooting depth and is droughtly. The hazard of erosion is moderate to severe. These soils are in capability subclass VIs.

CrD-Charlton-Hollis fine sandy loams, very rocky 15 to 45 percent slopes

This moderatly steep to steep 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. Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is rapid or very 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 rapid or very rapid. Hollis 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. Stoniness and rock outcrops make the use of farming equipment impractical. The Hollis soil has a shallow rooting depth and is droughty. These soils are in capability subclass VIIs.

HrC-Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes

This gently sloping to sloping complex consists of somewhat excessively drained and well drained soils and Rock outcrop on glacial till uplands. Stones and boulders cover 1 to 8 percent of the surface. The soils and Rock outcrop in this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used.

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.

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.

These soils are not suited to cultivated crops. Stoniness and the Rock outcrop make the use of farming equipment impractical. The hazard of erosion is moderate to severe. These soils are in capability subclass VIIs

HrD-Hollis-Charlton-Rock outcrop complex, 15 to 45 percent slopes

This moderately steep to very steep complex consists of somewhat excessively drained and well drained soils and Rock outcrop on galcial till uplands. Stones and boulders cover 1 to 8 percent of the surface. These soils and Rock outcrop in this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used.

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

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

These soils in this complex are not suited to cultivated crops.

Stoniness and the Rock outcrop make the use of farming equipment impractical. The hazard of erosion is severe. These soils in this complex are in capability subclass VIIs.

Np-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.

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 well suited to cultivated crops. This soil is in capability subclass IIw.

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 surfacelayer 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.

SwB-Sutton very stony fine sandy loam, 0 to 8 percent slopes

This nearly level to gently sloping, moderately well drained soil is on upland glacial till plains, hills, and ridges. Stones and boulders cover 1 to 8 percent of the surface. The Sutton soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is slow or medium. Sutton 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. Stones and boulders make the use of farming equipment difficult. This soil is in capability subclass VIs.

SxB-Sutton extremely stony fine sandy loam, 0 to 8 percent slopes

This nearly level to gently sloping, moderately well drained soil is on upland glacial till plains, hills, and ridges. Typically, this Sutton soil has a very dark grayish brown, fine sandy loam surface layer 4 inches thick. The subsoil is yellowish brown, dark yellowish brown, and dark brown, mottled fine sandy loam and sandy loam 29 inches thick. The substratum is olive brown, mottled sandy loam to a depth of 60 inches or more. The Sutton soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is slow or medium. Sutton 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 in capability subclass VIIs.

8. LAND USE AND TRANSPORTATION

The area of the proposed subdivision is located in the southeastern section of the Town on the easterly side of route 85. A single-and multi-family development is located immediately north of the proposed subdivision. City of New London reservoir holdings are located to the east. The proposed subdivision surrounds Salem Country Gardens Nursery and low density residential uses on the east side of Route 85. The area to the west of Route 85 is presently undeveloped, but a forty-five lot subdivision will be constructed in the near future.

This area is depicted a low density uses on the adopted Regional Development Plan, with residential densities of less than one unit per 1.5 acres. The Salem Plan of Development recommends residential development for this area. The area is zoned for rural residential uses with residential lot sizes of one unit per 80,000 square feet. On a land use basis, the proposed uses for the area.

Because the eastern and central portion of the site has steep slopes, shallow to bedrock soils, bedrock outcrops and wetlands, it would be very desirable to cluster the development on the beter lands located in the northern and western portions of the site. The "cluster" principle of residential development advocates grouping dwelling units closer together on a given tract of land and preserving the remainder as open space. The same number of dwelling units are build on the tract with cluster development as without it.

It would be desirable to provide another access to the proposed development. Consideration should be given to connecting to Horse Pond road or Maynard Road to the northwest or to the KIM property to the south, recogniz ing that there may be physical or ownership constraints on both of these alternatives.

Route 85 had a 1985 Average Daily Traffic (ADT) count of 10,000 in the area of the proposed development. When Route 11 is completed to Waterford at some future date, this could reduce traffic volumes on Route 85. Data from the Institute of Transportation Engineers indicate a single-family development can be expected to generate 10 daily trips per home. Sixty-four new homes would mean 640 daily new trips using Route 85. No major highway improvements are indicated in the Regional Transportation Plan for Route 85. However, road access plans onto Route 85 should be reviewed with DOT officials so that any improvements, such as turning lanes, can be coordinator with the forty-five lot subdivision to be develope4d on the west side of Route 85.

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--an 86 town area.

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. 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 Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.