Environmental Review Team Report

Zamore Subdivision

Old Lyme, Connecticut

RC&D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

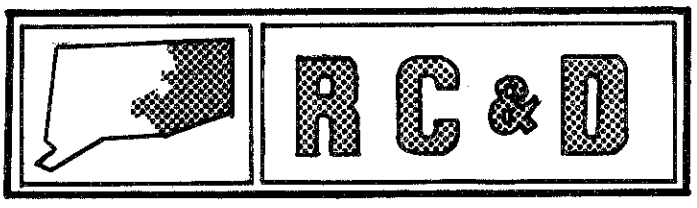
Environmental Review Team Report

on

Zamore Subdivision

Old Lyme, Connecticut

May 1980

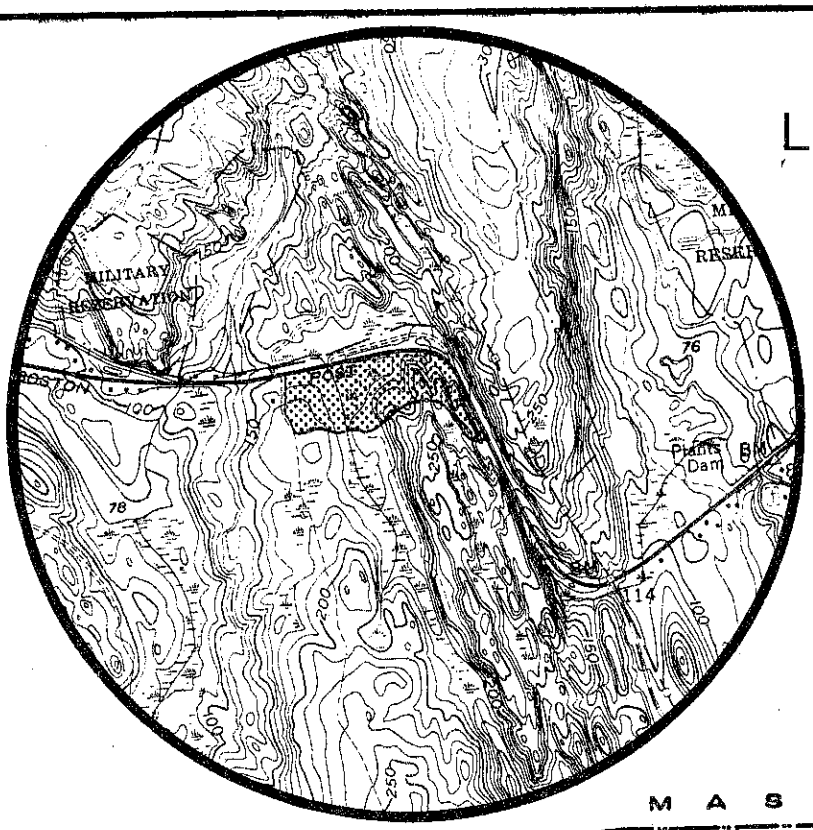


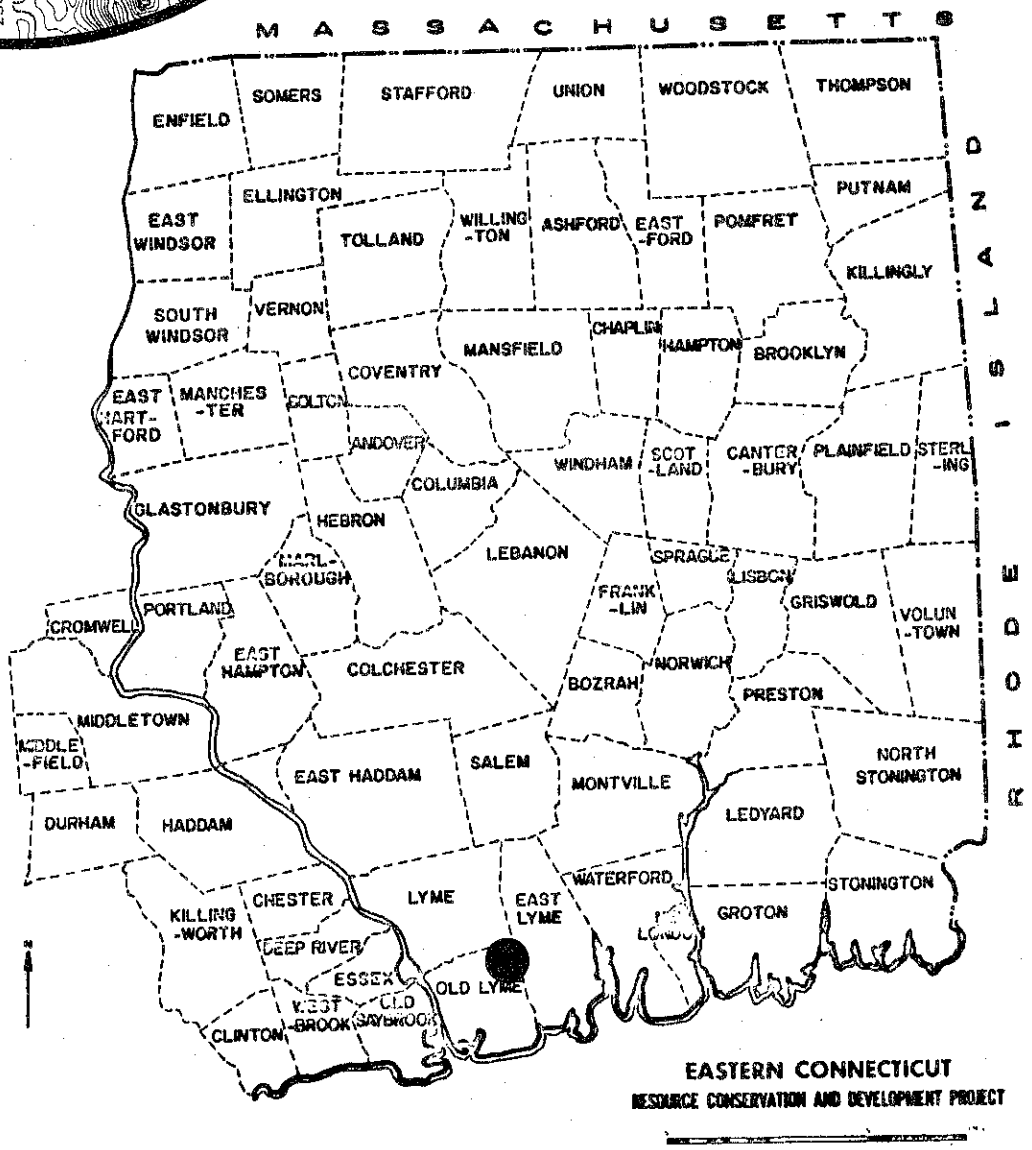
eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

ZAMORE SUBDIVISION
OLD LYME, CONNECTICUT





ENVIRONMENTAL REVIEW TEAM REPORT
ON
ZAMORE SUBDIVISION
OLD LYME, CONNECTICUT

This report is an outgrowth of a request from the Old Lyme Planning 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: Gary Domian, District Conservationist, SCS; Mike Zizka, Geologist, Department of Environmental Protection (DEP); Rob Rocks, Forester, DEP; Don Capellaro, Sanitarian, State Department of Health; Ed Meehan, Regional Planner, Connecticut River Estuary Regional Planning Agency; Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Thursday, April 10, 1980. 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 Old Lyme. 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, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.


Topography
Site Boundary
0
660'
scale
N
POST
114

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to review a proposal for a 22± acre subdivision located in the northeastern section of Old Lyme on Route 51 (Old Boston Post Road). The land is currently under option to David Zamore; preliminary plans have been prepared by Dean Phillips, a consulting engineer from the Portland area. Detailed soil mapping data has also been developed for the site.

Preliminary plans show 8 lots of approximately 2 acres or more. All lots will be served by on-site wells and on-site septic systems. Access will be provided by a series of interconnecting driveways which extend to Boston Post Road. A portion of the property has been reserved for development of a fire pond for community use. Copies of drawings CG-1 and CG-2 were distributed for Team evaluation, no construction drawings were available for Lots 291-299. Plans had not been prepared for the driveway into Lot 299.

The topography of the site ranges from steep to gently sloping. The area is currently vegetated with a mixed hardwood forest, dominated by red maple and other moisture tolerant tree species. Soils present on the site range from a Charlton-Hollis series, which may have areas of shallow depth to bedrock, to the Leicester series, a regulated wetland soil under Public Act 155.

The Team is concerned with the effect of the proposed development on the natural resource base of the site. Although severe development limitations can be overcome through proper engineering techniques, these measures are often costly, making a project financially unfeasible for a developer. Need for implementation of certain engineering practices on this site are obvious, due to the physical constraints of steep slopes, large wetlands and shallow depth of soil to bedrock, which are present. These conditions can lead to problems with improper functioning of septic systems, wet basements and potential contamination of individual water supplies, if proper planning has not taken place.

Preliminary plans indicate that the only development taking place on the steepest slopes on the site will be the establishment of a driveway to Lot 299. The areas to be cut are to be graded and seeded as soon after construction as possible. This is critical in the areas close to the wetlands, so that sediment does not wash out onto the wetland areas. This development proposal will cause no significant increase in storm-water runoff in the stream on-site. There may be a slight increase in runoff from the site into the proposed fire pond, however.

Well designed sewage disposal systems will decrease the potential of on-site pollution problems. Excessively drained soils can allow sewage effluent to enter into shallow groundwater supplies. Shallow depth of soil to bedrock can also allow poorly renovated septic effluent to enter groundwater supplies (see Water Supply Section of this report for a more detailed explanation). The location of wells and septic systems in the easternmost lots in this proposed subdivision have the greatest potential for this type of water supply contamination. Of particular concern is the septic system location in Lot 299, which was submerged on the date of the Team field review. The deep test pit was located in a natural drainageway on this lot.

Given the potential problems with septic system installation and proper

functioning, as well as questionable access, it is the Team's opinion that Lot 299 be eliminated or combined with an adjoining lot. If a suitable area for septic system installations can be found on this lot, the Commission may wish to reconsider these comments. Other concerns which the Commission may wish to explore before final approval is given on this plan, relate to a potential ownership problem with the fire pond. Town regulations encourage establishment of lot lines so that all water bodies remain in undivided ownership. Also, the Town has the authority to require a bond to insure the construction of suitable driveways on the site.

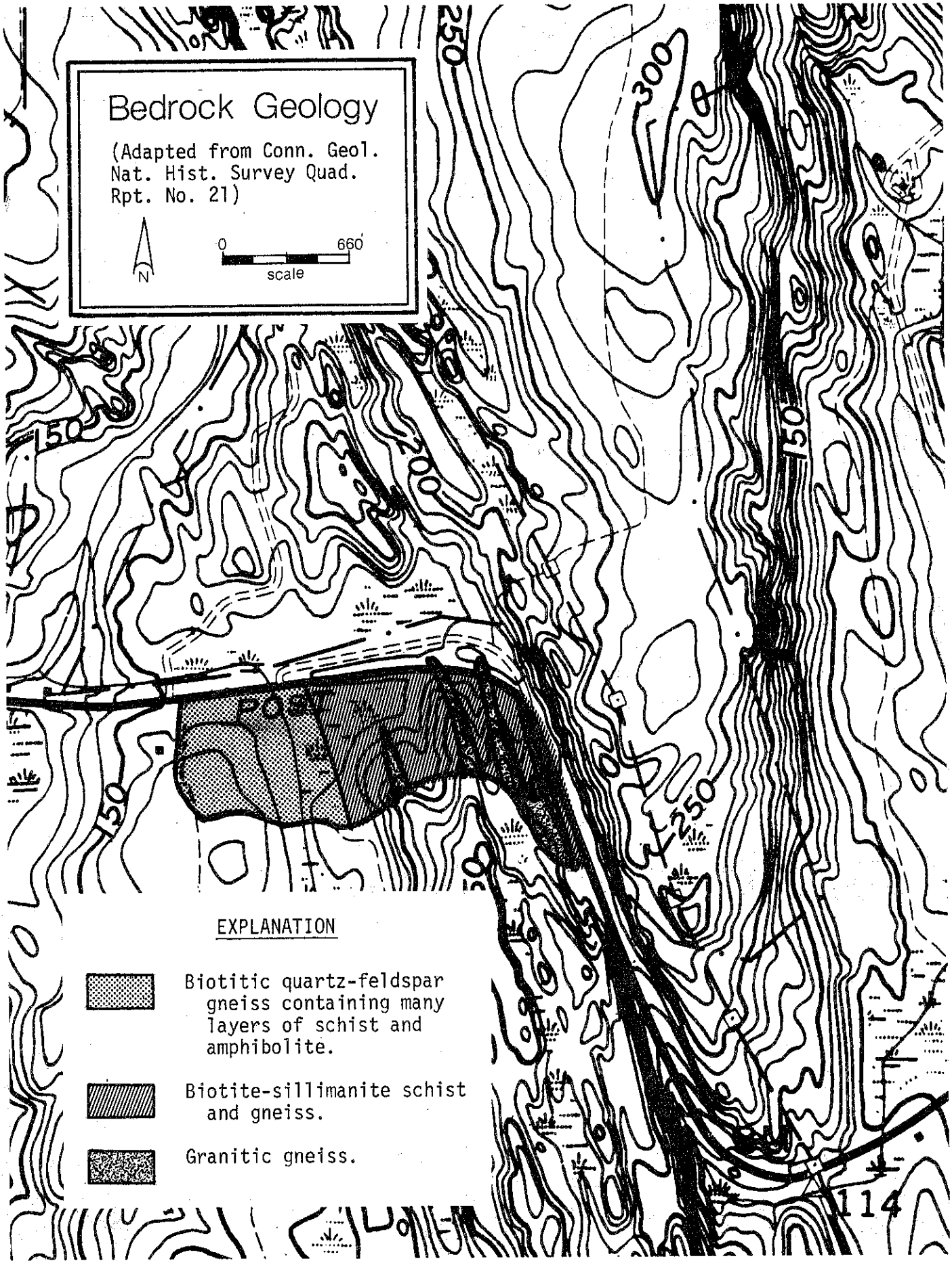
ENVIRONMENTAL ASSESSMENT

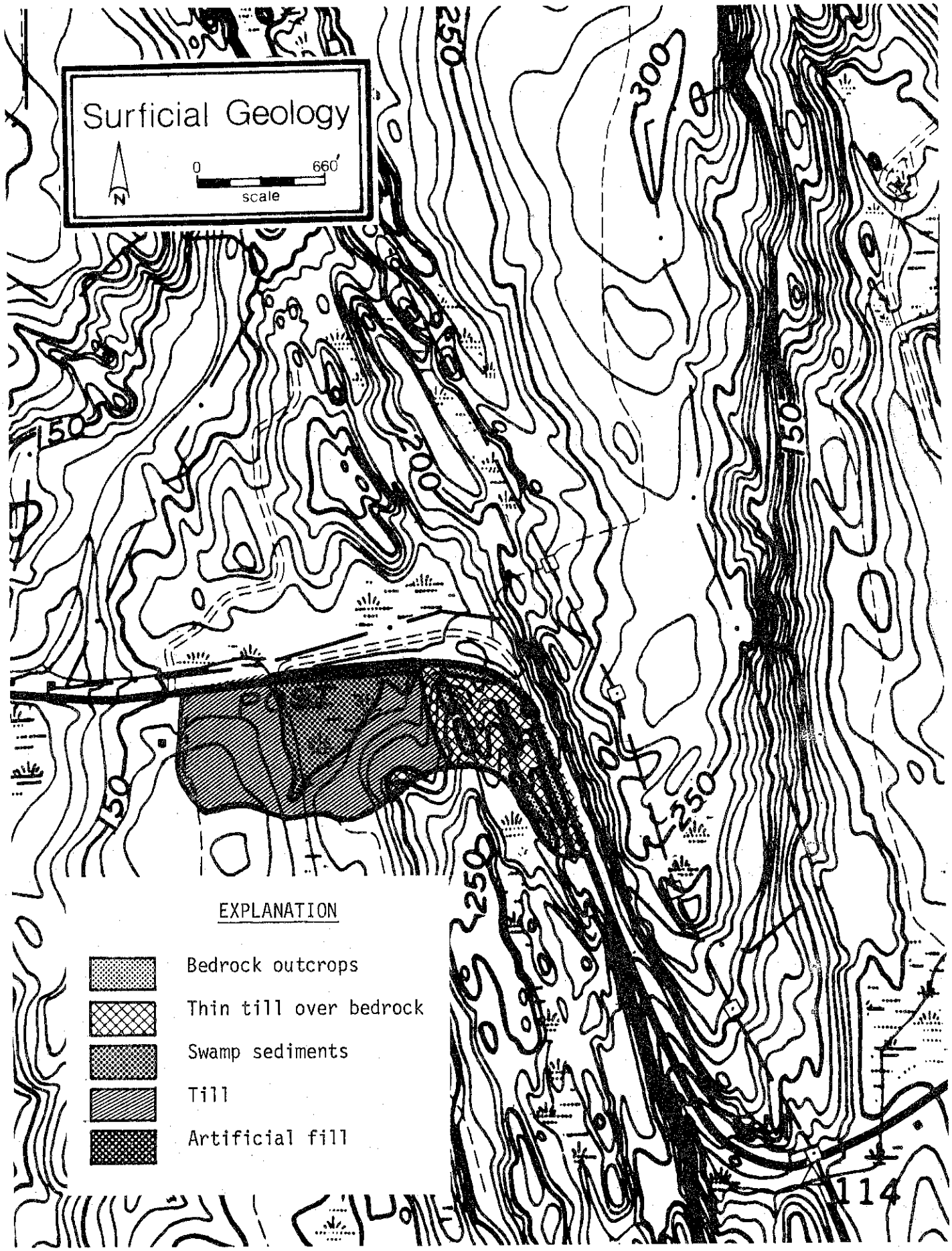
GEOLOGY

The Zamore property is located within the Old Lyme topographic quadrangle. Bedrock and surficial geologic maps and reports for that quadrangle have been published by the Connecticut Geological and Natural History Survey (respectively, Quadrangle Report No. 21, by L. Lundgren, Jr., 1967; and Quadrangle Report No. 31, by R.F. Flint, 1975).

The accompanying bedrock map shows the approximate distribution of the various bedrock types on the site. The map, which was adapted from QR-21, mentioned above, indicates the type of rock that would be expected to be found on any part of the site in the absence of a surficial cover. The bedrock is actually exposed only in the eastern half of the property. In that section, the rock type alternates between granite gneiss and biotite-sillimanite schist. The gneiss is a light gray to pink, medium- to coarse-grained rock composed largely of quartz, plagioclase, and microcline, with lesser amounts of biotite, hornblende, magnetite-ilmenite, and garnet. The schist is a well-layered, often easily disaggregated rock that is recognized by the abundance of black biotite mica flakes on parting surfaces. Since the schist weathers and disintegrates much more rapidly than the gneiss, it is usually the gneiss that is found in outcrops. Schist boulders and cobbles were retrieved from several of the test holes. The western half of the site is underlain by a biotitic quartz-feldspar gneiss that contains many layers of schist and hornblende-rich rock.

The surficial cover, or overburden, on the property consists of a granular till, of which the primary parent material appears to have been the local granite gneiss. Till is a glacial sediment composed of rock particles which were removed from preexisting rock outcrops and soils by a mobile ice sheet and which were redeposited directly from the ice. Although rock particles of all shapes and sizes may be contained within a till deposit, the predominant size of particles in the till on the site appears to be sand. Indeed, the till is so low in fine particles in some parts of the property that it has the sandy and gravelly texture of glacial stream deposits. Nevertheless, there is a finer-grained, more compact till that often is found at depths of 3 feet or more.


Bedrock Geology
(Adapted from Conn. Geol. Nat. Hist. Survey Quad. Rpt. No. 21)
N
0
660'
scale
EXPLANATION
Biotitic quartz-feldspar gneiss containing many layers of schist and amphibolite.
Biotite-sillimanite schist and gneiss.
Granitic gneiss.
114


Surficial Geology
N
0
660'
scale
250
300
150
200
150
150
250
250
EXPLANATION
Bedrock outcrops
Thin till over bedrock
Swamp sediments
Till
Artificial fill
114

HYDROLOGY

Because of its typically coarse-grained texture, groundwater movement through the till on the property is relatively rapid during most times of the year. In several areas, however, groundwater movement is restricted either by the existence of a more compact till at depth or by the proximity of bedrock to the land surface. On the day of the field review, following a period of significant precipitation, water levels in several of the test pits were high (within 2 feet of the surface), while no water was observed in other test pits. The proposed location for the septic system in Lot 299 was proved by the heavy precipitation to be an intermittent drainage swale - the test hole there was submerged under a temporary streamlet. The location was flanked by bedrock ridges that diverted runoff flows toward the swale. A more suitable location for the septic system appeared to exist in a higher area to the north-northwest of the originally proposed site.

The property contains one major wetland area in the north-central portion. The wetland is traversed by the one perennial stream on the site. A driveway crossing of the stream has been proposed near the point where the stream enters the site from the south. The developer has also proposed the creation, by dredging, of a fire pond just north of the crossing. A hydrologic analysis of the stream and its watershed indicates that the peak flows to be expected at the crossing would be approximately 88 cubic feet per second (cfs) for the 25-year, 24-hour storm; 124 cfs for the 50-year, 24-hour storm; and 167 cfs for the 100-year, 24-hour storm. Development of the site would not increase these flows, although runoff from the property to the wetland/pond would increase somewhat.

In general, the proposed development would be affected by, but would not noticeably affect, the hydrology of the area. The creation of the pond might lower the water table slightly in the immediate vicinity during the summer months. This result would be expected from increased evaporation of water. Conversely, during periods of wetness, the local water table may be increased slightly because of the removal of the water-absorptive vegetation.

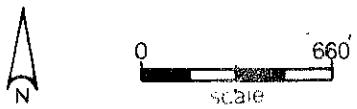
VEGETATION

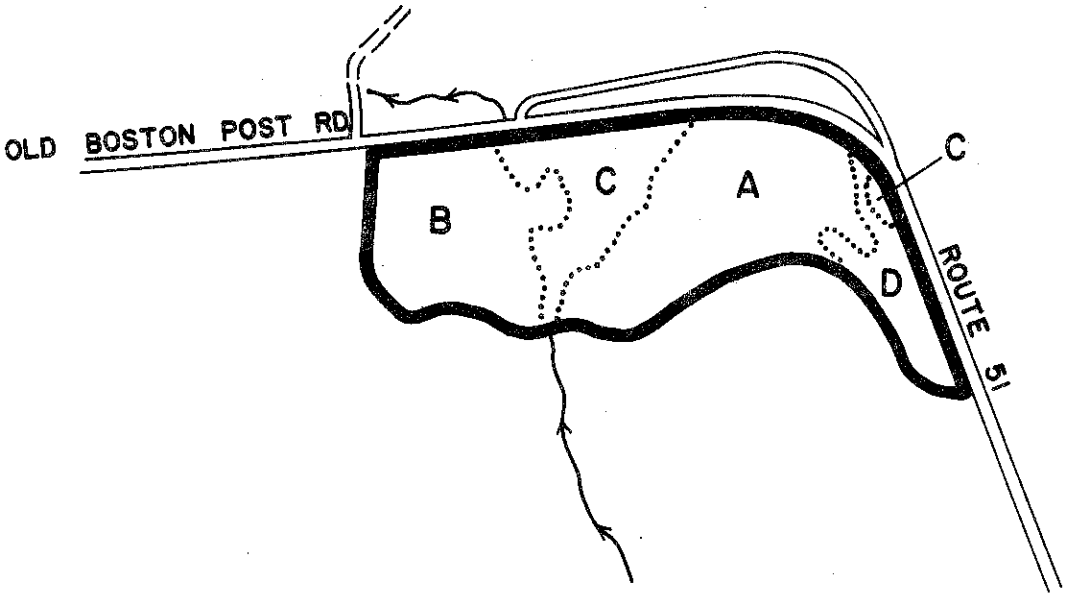
The 22± acre tract proposed for subdivision by David Zamore is completely forested. It is divided into four vegetation stand types, including two mixed hardwood stands totaling 15 acres, one hardwood swamp area, 4 acres, and a mixed hardwood/oak ridge stand, 3 acres in size. (See vegetation type description chart and vegetative type map.) Vegetative growth and quality is limited by adverse soil condition in the hardwood swamp (Stand type C) and the mixed hardwood/Oak ridge area (Stand type D). The trees in the mixed hardwood stands A and B are declining in health and vigor and would benefit by receiving a fuelwood thinning.

No unusual or exceptionally valuable vegetation types or conditions were observed on this tract. The hardwood swamp does, however, deserve mention because of its value as a wildlife habitat. The dense shrub and herbaceous vegetation present in this area provides high value cover and food for many species of wildlife. Preservation of this area as open space is desirable.

The scattered patches of mountain laurel located in Stand type A, could improve the aesthetic quality of this area if they were retained. Heavy flowering

Vegetation





LEGEND

- ROAD
- PROPERTY BOUNDARY
- VEGETATION TYPE BOUNDARY
- STREAM

VEGETATION TYPE DESCRIPTIONS

TYPE A. Mixed hardwoods, 8-acres, Fully-stocked. Pole with occasional sawtimber.

TYPE B. Mixed hardwoods, 7-acres, over-stocked, sapling to pole-size.

TYPE C. Hardwood swamp, 4-acres, under to over-stocked, sapling size.

TYPE D. Mixed hardwoods/oakridge, 3-acres, fully-stocked to over-stocked, sawtimber size.

VEGETATION TYPE DESCRIPTIONS

STAND TYPE	ACRES	MAIN STAND *SIZE CLASS	STOCKING LEVEL	MAIN STAND QUALITY	MAJOR COMPONENTS OF: OVERSTORY	UNDERSTORY	GROUND COVER
A. Mixed Hardwood	8	pole with occasional sawtimber-size	fully stocked	medium. trees are beginning to show signs of stress due to crowding	black oak, white oak, black birch, pignut hickory and red maple	hardwood tree seedlings, highbush blueberry, maple leaved viburnum, and scattered patches of mountain laurel	huckleberry and clubmoss
B. Mixed Hardwood	7	sapling to pole-size scattered sawtimber size trees near stone walls	over-stocked	medium. trees are slow growing and crowns are small, due to the crowded condition of this stand.	red maple and white ash, with occasional black birch, red oak, black cherry and sugar maple	sweet pepper bush, high bush blueberry, green-brier and occasional gray birch and red cedar	club moss poison ivy
C. Hardwood Swamp	4	sapling - size	stocking is variable from under-stocked to over-stocked	Poor. many trees have small broken crowns	red maple, black gum and widely scattered yellow birch	spice bush, sweet pepper bush, highbush blueberry, speckled alder, swamp azalea and winterberry	skunk cabbage, cinnamon fern, royal fern, braken fern, false hellebore sphagnum moss and tussock sedge
D. Mixed Hardwood/ Oak Ridge	3	sawtimber-size	fully stocked to over stocked	poor. trees are deformed, many have broken tops	white oak, black oak, chestnut oak, yellow birch, black birch with occasional red maple and sassafras.	Mountain laurel, witch hazel, azalea and scattered hardwood tree seedlings	huckleberry, Christmas fern and club moss

*Seedling size - Trees less than 1 inch in diameter at 4½ feet above the ground (d.b.h.)
Sapling size - Trees 1 to 5 inches in d.b.h.
Pole size - Trees 5 to 11 inches in d.b.h.
Sawtimber size- Trees 11 inches and greater in d.b.h.

of these shrubs may be stimulated by removing enough overstory trees to allow full sunlight to reach them.

The large, high quality (free from damage and defect) trees which are scattered throughout this property, should, where possible, be retained for their aesthetic value.

Development of this property will require excavating, filling and grading for construction of driveways, buildings and septic systems. These practices often disrupt the balance between soil aeration, soil moisture level and soil composition. Trees are very sensitive to the condition of the soil within their driplines. This zone corresponds to the entire area under a tree's crown.

Soil disturbances within this zone may cause a further decline in tree health and vigor, potentially resulting in tree mortality within three to five years. Mechanical injury to trees may cause the same results. Soil disturbance near trees that are to be retained should be minimized. Where feasible, trees may be saved in small groups or "islands." This practice lowers the possibility of soil disturbances and mechanical injury. Individual trees and "islands" of trees should be temporarily but clearly marked so they may be easily avoided during construction.

The soils associated with the hardwood swamp (Stand type C) are poorly drained and saturated during the greater part of the year. Vegetation growth is limited to species that can tolerate the high-water table and poorly aerated soils. The red maple and black gum present in this stand are unstable because their root systems are shallow and their growth rates are retarded. The poor condition of many of these trees is a result of their crowded condition and slow growth combined with adverse weather conditions.

The numerous outcrops and shallow to bedrock soils present in the mixed hardwood/Oak ridge area (Stand type D) severely limit the growth rates and the quality of many of the trees growing in this stand. Lack of adequate moisture during the rapid growth season and exposure to adverse weather conditions cause the malformed and damaged appearance of many of these trees. Ruggedness of the terrain in this area and poor tree quality precludes economical management of this stand for timber products.

Scattered throughout this tract (excluding the hardwood swamp area) are poor quality remnant trees with large dead branches. These trees are commonly located near the stone walls which run through this property. Falling branches from these trees may become a hazard to people, property, roadways and buildings or utility lines that are constructed near them. Trees which do create a potential hazard should be removed or pruned prior to construction.

The windthrow hazard is severe in the mixed hardwood/Oak ridge area (Stand type D). As a result of the shallow nature of the soils in this stand, the trees present are unable to become securely anchored, however, where the underlying bedrock is highly fractured, tree roots may penetrate deeper, causing trees to be somewhat more stable. Linear clearings, opened up for access to this area, may cause increased exposure to winds, which may in turn increase the already high windthrow hazard.

Suggested Management Techniques

The trees throughout this entire property are declining in health and vigor, and would benefit by some form of forest management. Thinnings, which would improve the health and vigor of the trees by reducing the crowded condition, are limited to stands where a product such as fuelwood can be removed and where operability does not limit product removal. Both Stands A and B meet these requirements. Fuelwood thinnings, which would remove approximately one-third of the total volume present (or between 4 and 6 cords per acre), would reduce competition for sunlight, water and nutrients between residual trees. This would, over time, result in a healthier, more stable forest. The thinnings mentioned above should focus on the removal of poor quality trees, damaged trees and unhealthy trees, along with trees which are directly competing with healthy, high-quality trees.

Ideally, this thinning should take place prior to subdivision of this property. Trees would then have a chance to become healthier before construction begins. If the thinning is not agreed to, owners could thin this area on an individual lot basis.

Trees that are removed for roadway, building, or septic system construction should be utilized for fuelwood.

SOILS

A detailed soils map of this site and detailed soils descriptions are included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320'/inch scale to 660'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitation chart indicates the probable limitations of each of the soils for on-site sewage disposal, buildings with basements, streets and parking, and landscaping. 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. The soils map, with the publication, New London County Interim Soil Survey Report, can aid in the identification and interpretation of soils and their uses on this site. "Know Your Land: Natural Soil Groups for Connecticut" can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

Wetland Soils

Wetlands in the upland glacial till soils are occupied by Ridgebury, Leicester and Whitman extremely stony fine sandy loams. The soils are designated by the mapping unit symbol 43M. The symbol "M" indicates extremely stony surface conditions. The Ridgebury and Whitman soils have moderate to moderately rapid permeability in the surface layer and subsoil and slow or very slow permeability in the substratum (fragipan).

The Leicester soils have moderately rapid permeability throughout. The sea-

sonal high water table for Ridgebury and Leicester soils is at or near the surface 7 to 9 months of the year. The Whitman soil has a high water table at or near the surface 9 to 10 monts of the year. Whitman soils have high runoff potential. Runoff is slow to medium in Ridgebury soils and slow in Leicester soils. This soil is designated as a wetland soil and is regulated under Public Act 155.

Depressional areas within outwash plains, lake plains, till plains and moraines are occupied by Adrian and Palms mucks. The soils are designated by the mapping unit symbol 91. Both soils formed in mucky organic deposits, 16 to 51 inches thick. The Adrian soils formed over sandy mineral deposits and the Palms soils formed over loamy mineral deposits. The soils are very poorly drained. Adrian soils have a rapid permeability and the Palms soils have a moderately slow permeability. The high water table is at or near the surface 9 to 10 months of the year. Surface runoff for both soils is very slow. This soil is designated as a wetland soil and is regulated under Public Act 155.

Upland Soils

The gently sloping to sloping landforms highest in the landscape are occupied by Charlton-Hollis very rocky fine sandy loams and Hollis fine sandy loam-Rock outcrop complex. The Charlton-Hollis soils are designated by soil mapping unit symbol 17 LC and the Hollis-Rock outcrop soils are designated by soil mapping unit symbol 17 MC. The Charlton and Hollis soils formed in loamy glacial till. The Charlton soils are well drained and the Hollis soils are well to somewhat excessively well drained. Both soils have moderate to moderately rapid permeability. Surface runoff is medium to rapid in the Charlton soils and medium to very rapid in the Hollis soils.

Rock outcrop consists of exposed, weathered and unweathered granite, gneiss and schist bedrock. Rock outcrops range from few to many.

The gently sloping hills and mounds are occupied by Canton and Charlton fine sandy loams, and Canton and Charlton stony fine sandy loams, and Canton and Charlton extremely stony fine sandy loams. These soils are designated by the soil symbols 11D, 11XB, and 11MC respectively. The symbol 'X' denotes very stony and the symbol 'M' denotes extremely stony. Both soils are well drained. The Canton soils formed in a fine sandy loam mantle, underlain by friable to loose gravelly sand glacial till. Canton soils have moderately rapid or rapid permeability. The Charlton soils formed in friable glacial till. Charlton soils have moderate to moderately rapid permeability. Surface runoff is medium in Canton soils and medium to rapid in Charlton soils.

Outwash Soils

Windsor loamy sands occupy nearly level and gently sloping stream terraces and outwash plains. The soils are designated by the mapping unit symbol 67A. The symbol "A" denotes a 0 to 3 percent slope. The soils formed in glacial outwash. The soils are excessively drained. Windsor soils have rapid or very rapid permeability. These soils have slow to medium surface runoff.

Prime Farmlands

The Windsor soils, mapped as 67B, have soils within the mapping unit that qualify as Prime Farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland may now be in crops, pasture, woodland, or other land, but not urban and built up land or water areas. It must either be used for producing food or fiber or be available for these uses.

There are nine criteria that a soil must meet to be qualified as Prime Farmland. The criteria deal with moisture supply, soil temperatures, pH, water table, salt content, flooding occurrence, erodibility, permeability, and coarse fragments in the surface layer.

The designation of certain soil mapping units as prime farmland does not constitute a recommendation for a particular land use.

This plan was reviewed for soils limitations, lot location, well location, septic system location, and soil erosion and sedimentation.

The soils most severely limited for on-site sewage disposal are the wetland soils that are regulated under P.A. 155. According to the plan, no septic systems are planned for installation in the wetland soils. Buildings are not planned for installation into the wetland soils area. The only construction planned for the wetlands is the proposed construction of a fire pond and access driveways to the individual lots.

The proposed access driveway off of Boston Post Road in the west portion of the property crosses wetland soils twice prior to terminating on Lot 287. The first crossing off of Boston Post Road and the second crossing west of the house location on Lot 287 have both been designed by the project engineers to accommodate flow attributed to 100 year frequency storms. Two other critical areas of concern that are addressed on the plan are the riprap covered slope near the western corner of Lot 287 and proposed seeding plan for exposed soil areas.

The riprap design is to include a stone size that will withstand the volume and velocity of water travelling over it. The slope of the bank is critical in calculating the size of stone, and banks or slopes of 1.5:1 are suggested. A filter blanket of sand/or gravel between the riprap and the slope will reduce the chances of undercutting and having the riprap slide down slope.

The proposed seeding plan as indicated on the last page of the report is adequate, if it is applied as planned. A permanent cover of grasses and/or legumes will be necessary because annual ryegrass alone is not a good permanent cover. If seeding cannot be accomplished by October 15, then heavy mulching with straw and staked haybales should be used. The haybales must be firmly staked to be

effective. The upslope face of the haybale will catch more sediment behind it if a 6 inch berm of soil is built up against the haybale. This will create a small sediment pool behind each check dam site.

The access road on the east end of the property crosses the wetland off of Boston Post Road. This crossing has been designed as the others, to accommodate runoff flow as a result of a 100 year frequency storm. Bank stabilization and seeding recommendations are the same as mentioned before. The most critical grades encountered in building this access road are encountered on Lot 295. There is a cross slope grade of approximately 4 percent and a short uphill grade of approximately 10 percent near the termination of the access road to Lot 295. The grades are not unusually steep, however cutting the slope to reduce grade will be difficult because of shallow to bedrock conditions.

WATER SUPPLY

Water would be supplied to the lots by individual wells. Bedrock appears to be the only suitable aquifer on the site. Metamorphic rock of the type underlying the property transmits water chiefly by means of fractures, as pore spaces in the rock are few, small, and minimally interconnected. Achieving a suitable yield depends upon intersecting a large water-bearing fracture or group of fractures. Although fractures are irregularly distributed in bedrock, most wells are able to supply a yield of 3 gallons per minute (gpm) or more. Few bedrock wells, on the other hand, can supply more than 10 gpm. In most cases, a suitable yield is achieved without penetrating more than 200 feet of rock. It usually is unprofitable to deepen a well if an insignificant yield exists after drilling 200 feet; apparently the distribution of fractures decreases markedly with increasing depth.

The water quality should be good in most well supplies. Occasionally, biotite schists will contain sulfide minerals or easily weathered iron- or manganese-bearing minerals that may mineralize or add sulfur to the water. If such problems are encountered in the various lots, filtration may be needed. The more critical factor for water quality on this site would be the adequacy of septic systems in the shallower soils in the eastern section. A sufficient depth of soil (at least four feet) should underlie the bottom of the entire leaching field to guarantee that the septic-system effluent is properly purified by the time it reaches the bedrock-overburden interface. Bedrock itself has no significant renovative ability.

In general, wells should be located at a relatively elevated portion of the lots for protection against surface drainage as well as other forms of contamination. The direction of groundwater flow usually approximates that of the surface flow. Therefore, it is desirable to have a well located upgrade of the sewage installation(s). It would appear that the most critical area for wells would be along the eastern side of the property as it has considerable evidence of bedrock at or close to the ground surface. Because of shallow overlying soils, limited natural filtration and renovation, waste effluent is provided with a greater opportunity to travel much further, possibly polluting groundwater of a well aquifer.

A provision of the Public Health Code stipulates that no well permits are to be issued by the local health director until such time that public sewers are available or subsurface sewage disposal systems can be installed on the lots in accordance with the code. Old Lyme also has a regulation which requires the actual

development of a well on a lot in order to determine if there is sufficient yield, prior to the issuance of a building permit.

No future municipal water service is available to this site. The Old Lyme Town Plan recommends, as a long-range option, the extension of public water lines from East Lyme (1.0± miles east on Plants Dam) along the Boston Post Road to the Rogers Lake neighborhood. Should interconnection with East Lyme ever become a reality, public water service would be available to the site.

SEWAGE DISPOSAL

No future public sewers are planned in Old Lyme. This section of town is designated as a "Sewer Avoidance Area" which means that new systems must demonstrate that they can function properly. When questionable on-site conditions exist the Sewer Avoidance Program recommends engineered systems, careful installation and routine pumpout/maintenance.

According to soil survey mapping and deep test data, variable soil conditions exist. Underlying fragipan or hardpan with an elevated (perched) groundwater condition is noted in the area towards the western side of the site. Towards the eastern side, bedrock is evident. The area between these apparently has looser soils containing more sand. A high groundwater condition, for at least a part of the year, would be expected to be a factor there. Based on visual observations and consideration of the terrain characteristics, the amount of usable land area for sewage disposal purposes on some of the proposed lots would be restricted.

High groundwater or bedrock conditions on sites can interfere with the proper operation of sewage disposal systems meeting normal code requirements. Under such circumstances, detailed engineered plans would be required in order to show that specific adverse conditions, with site modifications, could be overcome and/or eliminated and that sewage systems could be installed which would be expected to function reliably and satisfactorily as provided under code provisions.

In respect to bedrock, there needs to be a minimum of 4 feet of soil between the bottom of a leacing system and rock. In addition, conditions are to be such that a leaching area will not be subject to possible surface flooding. The field review, followed a night of heavy rain. It was noted that the area that had been tested and proposed for leaching purposes at the eastern side (Lot 299) was inundated by flowing water. This was a result of the area being located in a natural drainage swale between two apparent rock ridges. Unless testing of other portions of the proposed lot reveals an area more suitable for sewage disposal purposes, serious consideration should be given to either the elimination of this lot or to possibly combine it with an adjoining one. In other lots, fill will be needed to assure that the bottom of the leaching field is at least 18 inches above seasonal high water. Where possible, leaching fields should be located in areas in which at least 2 feet of soil exist over the high water level. This would allow at least the bottom of the leaching trenches to be in natural soil. Leaching systems located entirely within fill may not adequately renovate the effluent and may allow leakage of effluent at the fill-soil contact.

In general, due to the various site and soil conditions, the property appears to be marginally suitable for properly designed systems.

PLANNING CONCERNS

This proposed 8 lot subdivision raises the following planning considerations and concerns. Proposed access to Lot 299, via a private drive serving 3 other lots, may be difficult due to steep slopes, boulders and ledge. During field inspection the team observed heavy surface runoff across Lot 299 as well as several areas of standing water. The proposal to develop this lot for a homesite is questionable in the team planner's opinion. Another concern that town officials should be aware of, is the length of the proposed private drive to the fire pond. If this pond is to be useful, the Town should require that the driveway surface and turn-around be maintained and that overhanging branches be cleared to permit passage of fire equipment.

ROADS

The proposed subdivision will be accessible from the Boston Post Road. This road is a State major rural collector road and functions as part of Old Lyme's arterial system. Average Daily Traffic Counts are not available for this segment of the Boston Post Road; however, this road is used for trips from Lyme and northern Old Lyme to East Lyme and New London. Highest traffic use occurs during summer months because this route can be taken as a "short cut" around Route I-95 bridge backup.

The proposed subdivision shows two private driveways, each serving four lots. These driveways will require State of Connecticut Department of Transportation (DOT) permits for access onto the Boston Post Road (Route 51). The Planning Commission and Board of Selectmen should require the applicant to submit a report from DOT verifying the adequacy of sight distance. Measured from the Site Development Plan Map it appears that sight distance for the driveway serving Lots 291-299 (eastern end) has approximately 400' to the curve. Sight distance from the western driveway is well over 400'. For safe sight distance, at operating speeds of 40 mph on a two-lane road, a minimum of 530' is recommended for left turning movement and 440' is suggested for right turn movement. (See source table.) However, DOT may have its own design standards for sight distance standard for driveway permits and these requirements are the applicable controls for this proposed subdivision.

The applicant should be aware of the questionable status of Old Stagecoach Road (south). The status of this road, whether legally abandoned or improved, is now being researched by Town Counsel. The development of the proposed "Fire Pond" could create a problem of ownership. Old Lyme's Subdivision Regulations, Section 4.3, encourage the delineation of lot lines so that all water bodies are in undivided ownership. In addition, Section 6.7 of Old Lyme's Design and Construction Standards require the approval of the Board of Selectmen for fire ponds.

HAZARDS

Inland wetlands extensively cover Lots 285, 287, 291 and 293. Proposed Lot 295 and 299 contain steep slopes, large bounders and areas of ledge. In general, all lots east of the brook running through the site have very difficult terrain and are limited by either inland wetlands or ledge/slope.

The proposed driveway across wetlands will disturb natural site drainage. The driveway serving Lot 299 will have to traverse steep lopes, ledge and bounders. Safe access to a suitable building site on Lot 299 may be difficult.

TABLE 1
SAFE SIGHT DISTANCES FOR PASSENGER CARS EXITING FROM DRIVEWAY ONTO TWO-, FOUR-, AND SIX-LANE ROADS

Operating Speeds	Two-Lane Roads		Four- and Six-Lane Roads	
	Left Turn	Right Turn	Left Turn	Right Turn
20 mph	150'	130'	130'	130'
30 mph	350'	260'	220'	260'
40 mph	530'	440'	380'	440'
50 mph	740'	700'	620'	700'
60 mph	950'	1,050'	950'	1,050'

Sight distances are mainly for urban highways. It is recommended that for rural highways, the distances should be increased by 10%.

SOURCE: Guidelines for Driveway Design and Location, op. cit., pp. 31-44. ENO Foundation for Transportation, Inc., Westport, Connecticut, 1972.

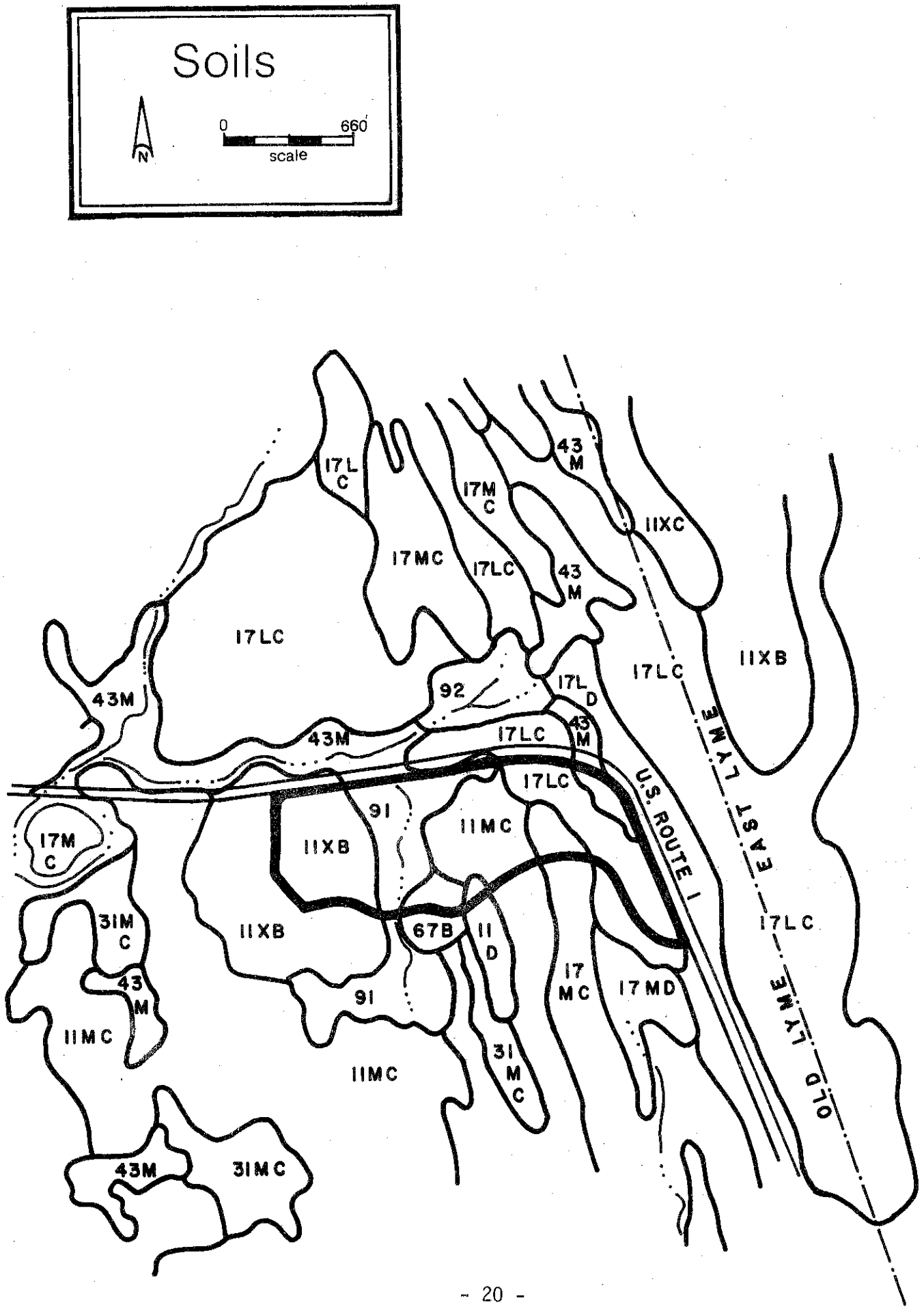
SERVICES TO SUPPORT DEVELOPMENT

The proposed subdivision of 8 lots should not place a burden on Old Lyme's public school system, municipal solid waste collection/landfill or other general government services. The applicant and local officials should, however, recognize that access into the proposed site will be impossible unless safe and passable driveways are constructed. Prior to approving this subdivision the town should have assurances that proper driveway access will be provided. Per Section 3 of Old Lyme's Driveway Ordinance, the Board of Selectmen may require a bond to insure that construction is completed to their satisfaction.

ALTERNATIVE LAND USES

The proposed subdivision is compatible with Old Lyme Zoning Map which designates this area as a Residential 2-acre district. The Old Lyme Town Plan of Development classifies the majority of this site for Open Space use because of its wetlands/stream and steep slopes. Surrounding land along the southern boundary is vacant. The property across Route 51 is controlled by the State of Connecticut as part of the Stone Military Reservation.

Appendix


Soils
N
0
660
scale
17L C
17M C
43 M
17MC
17LC
43 M
11XC
17LC
43M
92
17L D
11XB
43M
43M
17LC
17LC
U.S. ROUTE 1
EAST LYME
17M C
91
11XB
11MC
31M C
11XB
67B
11 D
17LC
43 M
91
17 MC
17 MD
11MC
31 MC
OLD LYME
43M
31MC

ZAMORE SUBDIVISION
OLD LYME, CONNECTICUT

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
					On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
Adrian-Palms	91	5	20	Wetness, flooding	3	3	3	3
Canton-Charlton	11D	1	4	Slope	3	3	3	3
Canton-Charlton	11XB	6	24	Large stones	2	2	2	2
Canton-Charlton	11MC	4	16	Slope, large stones	3	3	3	3
Charlton-Hollis Charlton Part Hollis Part	17LC	6	24	Slope, depth to bedrock	 2 3	 2 3	 2 3	 2 3
Hollis-rock outcrop	17MC	4	4	Depth to bedrock	3	3	3	3
Ridgebury, Leicester and Whitman	43M	1	4	Wetness, large stones	3	3	3	3
Windsor	67B	1	4	Excessive permeability	1	1	1	3

* Limitations: 1 = slight, 2 = moderate, 3 = severe.

** Regulated wetlands soil under P.A. 155.

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

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 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, 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 (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.