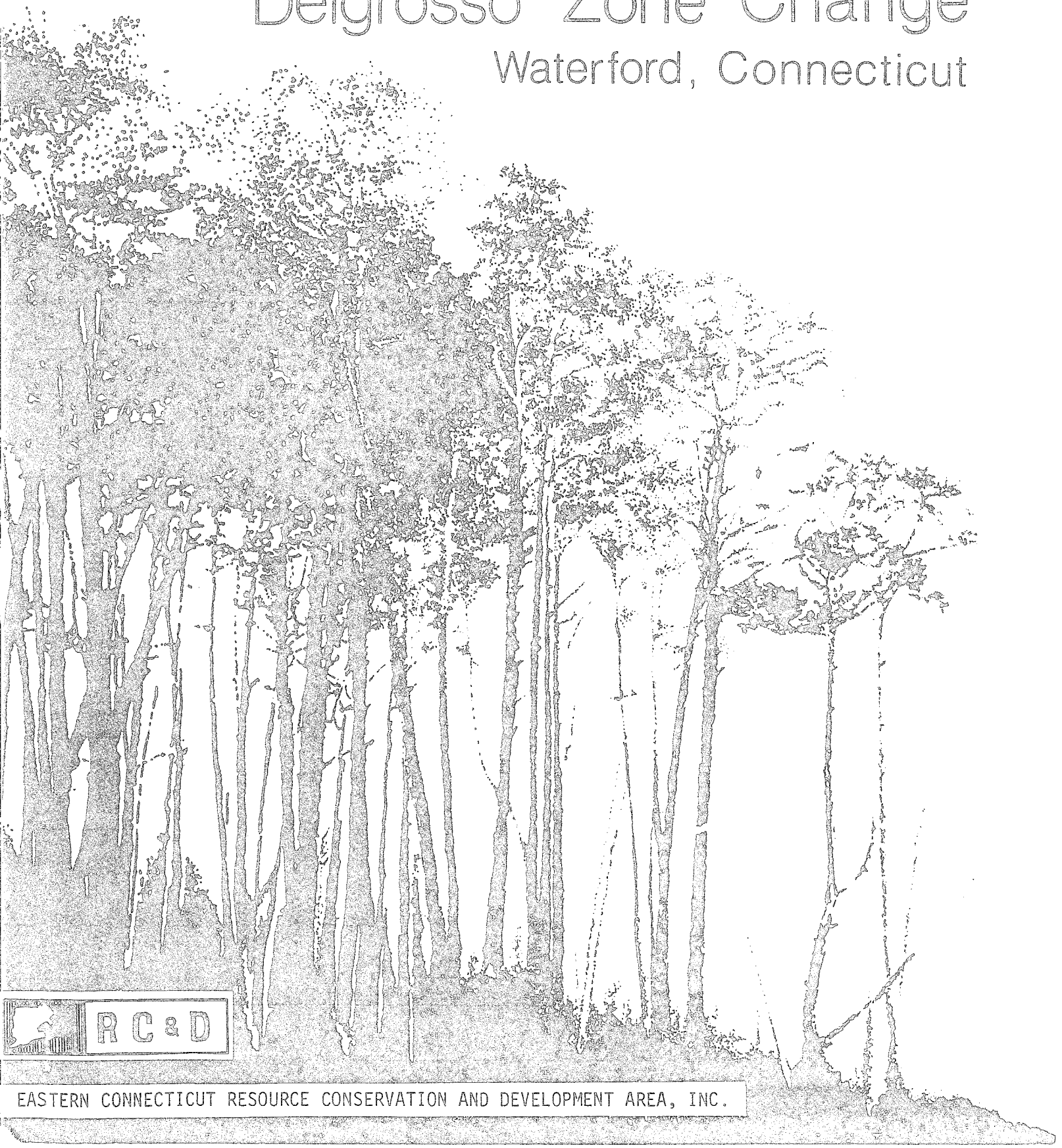
Environmental Review Team Report

Delgrosso Zone Change

Waterford, Connecticut



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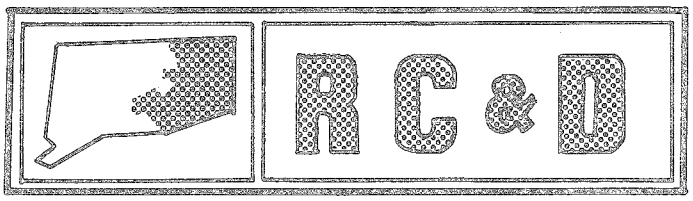
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report on Delgrosso Zone Change Waterford, Connecticut

March 1981



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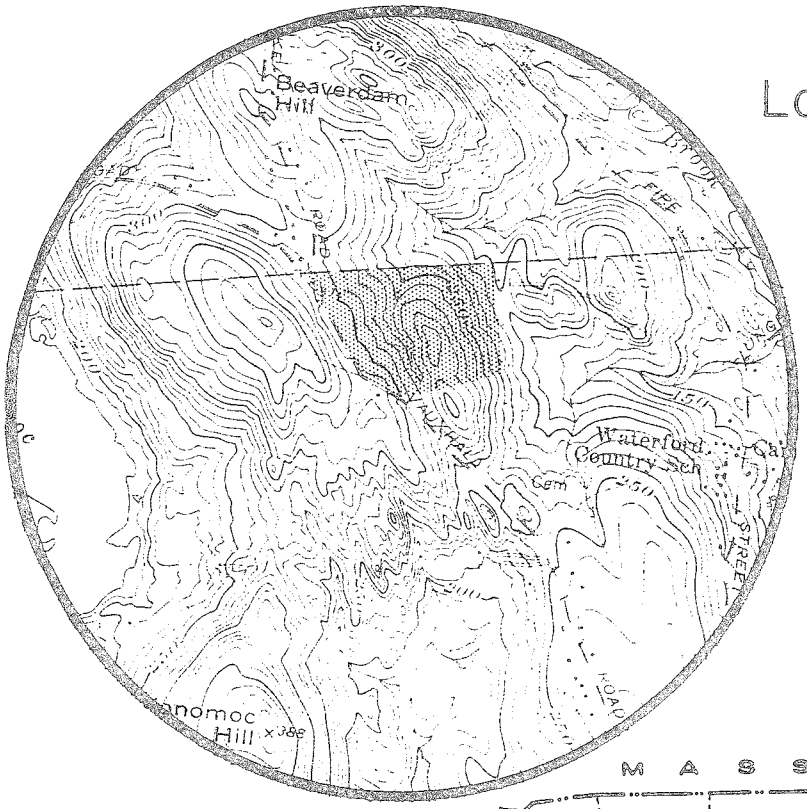


Location of Study Site

DELGROSSO ZONE CHANGE
WATERFORD, CONNECTICUT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
DELGROSSO ZONE CHANGE
WATERFORD, CONNECTICUT

This report is an outgrowth of a request from the Waterford Planning and Zoning 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.

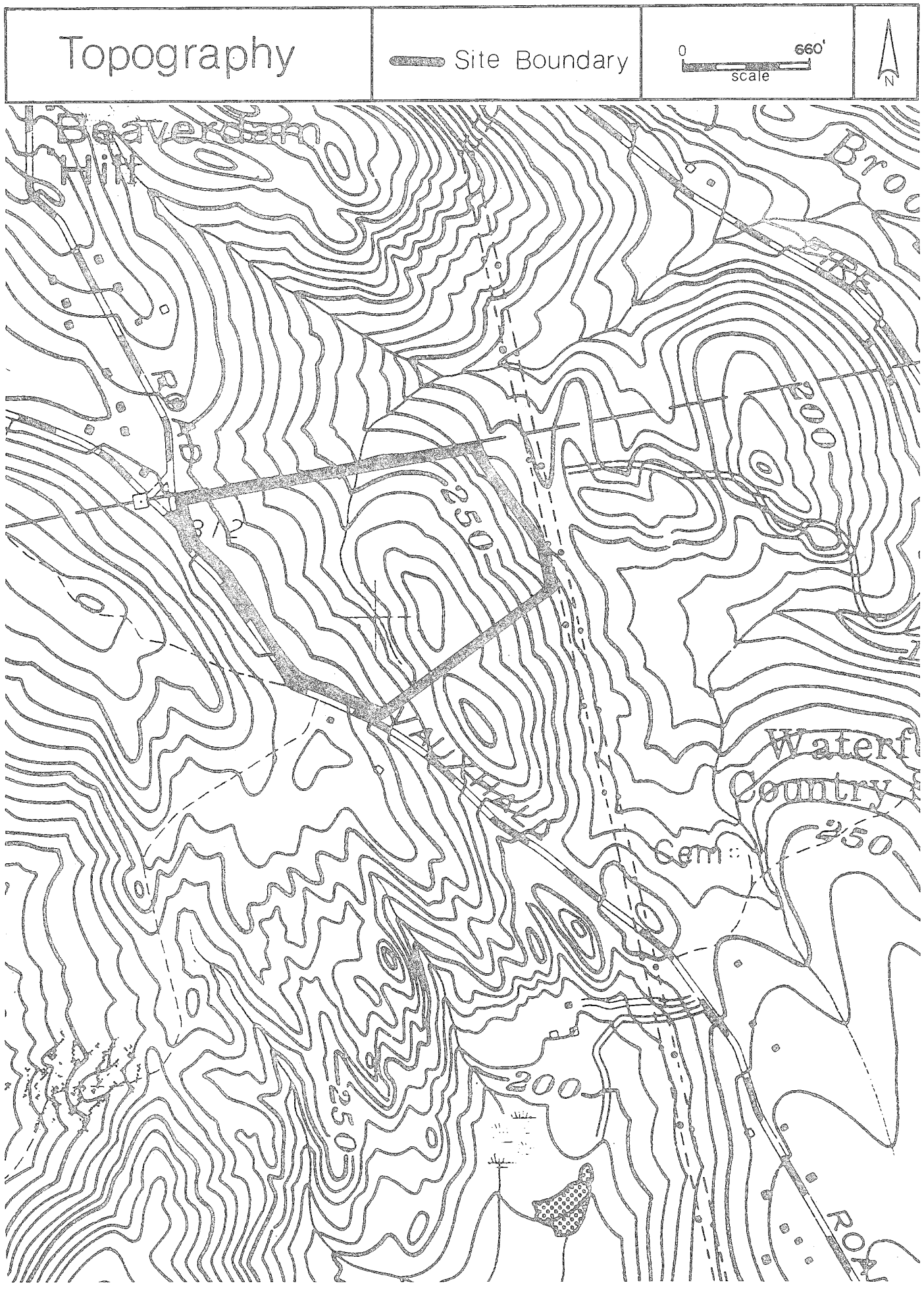
The ERT that field checked the site consisted of the following personnel: Gary Domian, District Conservationist, Soil Conservation Service (SCS); Mike Zizka, Geologist, Department of Environmental Protection (DEP); Rob Rocks, Forester, (DEP); Don Capellaro, Sanitarian, State Department of Health; Tom Seidel, Regional Planner, Southeastern Connecticut Regional Planning Agency; Lisa LaSorsa, Wildlife Ecologist, Connecticut College; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Tuesday, February 10, 1981. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

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

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

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.


Topography
Site Boundary
0
660'
scale
N
Beaverdam
Hill
Rd
212
250
200
Waterf
Country
Cem
250
200
250
Road

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a proposed zone change in the town of Waterford. The site is located on Vauxhall Street Extension at the Waterford/Montville town line. The property is presently in the private ownership of Anthony Delgrosso, a Waterford resident. Preliminary plans have been prepared by William F. Kent, land surveyor.

The site is approximately thirty-four acres in size and is currently zoned RU-120 (3-acre residential). The proposed plans call for a zone change to R-20 (one-half acre residential). Any homes constructed on this site in the future would be served by on-site wells and on-site septic systems.

The property is entirely forested at present. A wetland area and stream-course bisect the site. Slopes on the property are fairly gentle, but steeply sloping in some instances. These slopes dip toward the stream and to the east. Soil types range from Charlton-Hollis to Ridgebury, Leicester and Whitman, a regulated wetland soil under Public Act 155. Extremely stony conditions exist on the western section of the property. Drainage from the property eventually flows into Hunts Brook which is about 2500 feet east of the parcel.

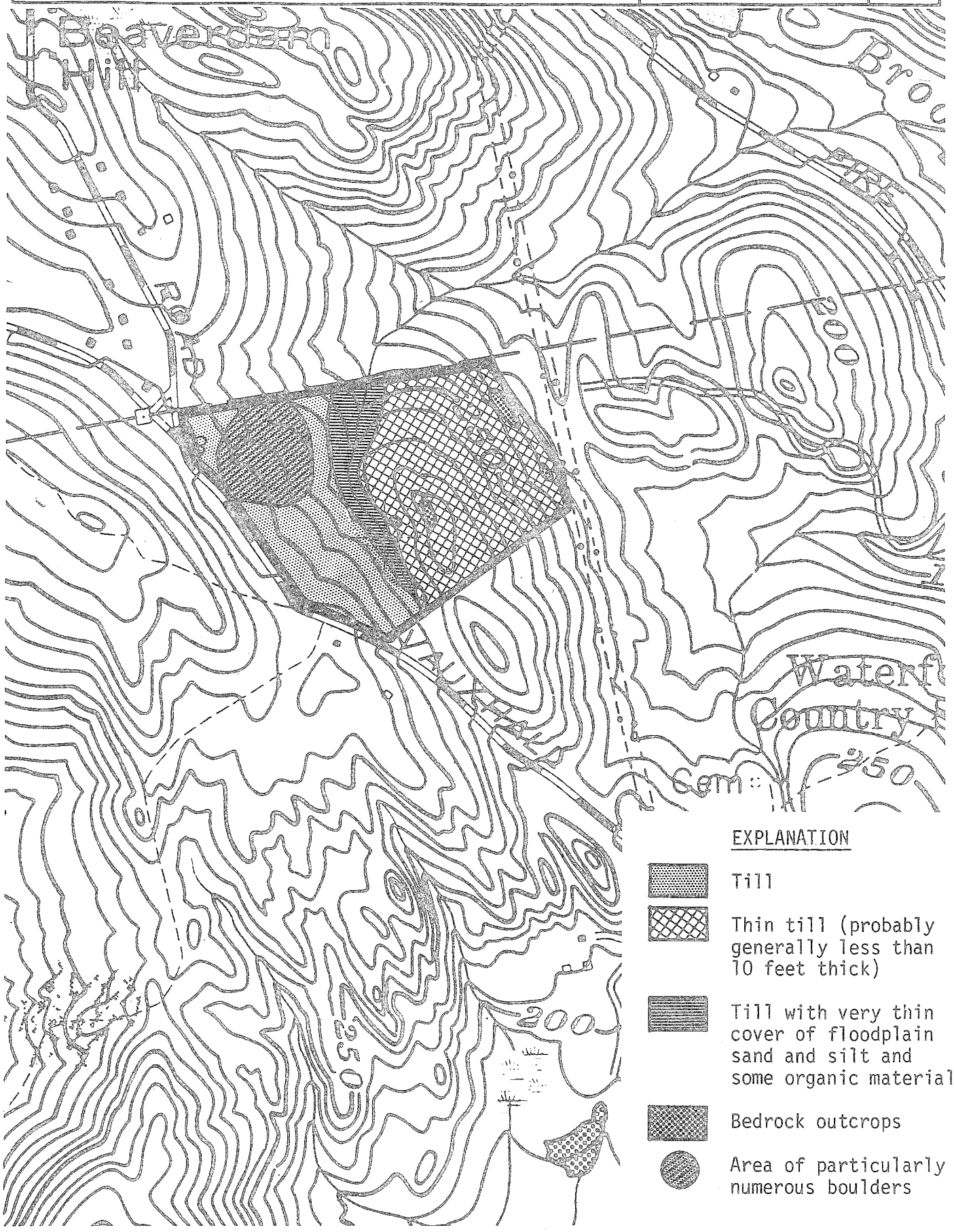
The Team is concerned with the effects of the proposed zone change on the natural resource base of this site. Although severe limitations to development can be overcome with proper engineering techniques, these measures can become costly, making a project financially unfeasible for a developer. Severe site characteristics such as variable depths to bedrock, steep slopes, boulder concentrations, seasonal highwater tables, and regulated wetlands limit the development potential of this site.

A change in the intensity of allowable development on this parcel will lead to greater increases in stormwater runoff and peak flow in local streams, should the parcel be developed. The magnitude of the increase will ultimately depend upon the amount of land disturbance which will accompany the development. It can be estimated that a one-half acre zone would allow six times the disturbance allowed in a three acre zone. Sediment and erosion control measures will be critical in protecting the site during times of heavy rainfall.

As it will be necessary for any development on the site to use both on-site wells and on-site septic systems, the potential exists for groundwater contamination. Given the marginal soils on site and their limiting conditions of shallow depth to bedrock, stoniness and steep slopes, it may be extremely difficult to locate both a well and septic system on a half acre lot. Poorly renovated septic effluent from these numerous systems will have the potential for entering wells downslope. In cases such as this, a well protected community water supply may be a viable solution.

Any proposed development based on half-acre zoning on this site will also produce a significant traffic increase on Vauxhall Street, a narrow collector street in this section of town. No improvements are currently planned for this road.

Surficial Geology



In general, natural resource information available for this site indicates that a low intensity use, as suggested by the current three acre zone, is better suited to the property. One alternative the developer may have is to proceed with a "cluster" proposal on this parcel. This would allow a greater density of housing on more easily developable sections of the site, allowing areas with greater limitations to development (i.e., wetlands) to be set aside for common open space.

ENVIRONMENTAL ASSESSMENT

GEOLOGY

The Delgrosso property is located in an area that is encompassed by the Montville topographic quadrangle. Bedrock and surficial geologic maps of the site, by Richard Goldsmith, have been published by the U.S. Geological Survey (respectively, Map GQ-609 and Map GQ-148). The bedrock is exposed in only a few scattered areas. The rock type is biotite granite gneiss, a lineated rock composed of equal amounts of quartz, microcline, and oligoclase, and 2 to 7 percent biotite and iron oxides. Garnet, sillimanite, and muscovite are accessory minerals.

Bedrock is covered in most areas by till, a sediment that was deposited directly from a pre-existing sheet of glacier ice. The till contains clay, silt, sand, gravel, and boulders, which are all mixed together in varying proportions. The texture of the till may range from sandy, stony, and relatively loose, to silty, less stony, and very tightly compact. The till is thin near the top of the site's central hill and it probably averages less than 10 feet thick over the eastern two-thirds of the property (east of the brook). The till west of the brook is more likely to exceed 10 feet in thickness, at least in some places. A massive concentration of large boulders lines a drainage swale near the northwestern corner of the site. In addition, numerous manmade cairns, or piles of boulders, were observed on the central hill. These boulders indicate that the till is extremely stony and may consequently hinder development.

From a geological perspective, the site appears to have a limited development potential. The variable depths to bedrock, steep slopes, and boulder concentrations suggest that low-intensity residential use is better suited to the property.

HYDROLOGY

The Delgrosso site lies within the watershed of Hunt's Brook, a stream which has, in conjunction with its adjacent stratified drift (sand and gravel) deposits, a moderate to high water-supply potential. Most of the property drains to a tributary of Hunt's Brook that originates in a wetland in the southwestern section. The southeastern section of the site drains to another Hunt's Brook tributary that lies completely off the property.

Development of the site will lead to increases in surface runoff as trees are removed, soils are compacted by heavy machinery, and impermeable surfaces such as roofs and driveways are created. Runoff increases will, in turn, lead to increases in the peak flow rates of local streams during and following periods of precipitation. The magnitude of the increases naturally will depend on the amount of land disturbance that occurs. Development under a half-acre zoning scheme would mean that about six times the amount of disturbance could occur as compared to potential development under the existing three-acre zone. It may be possible to minimize the effects of any runoff increases through erosion controls and peak-flow reducing measures, but, of course, the need for such artificial controls would be more critical with a half-acre zone, particularly in light of the locally steep slopes.

Another hydrologic factor that should be considered is groundwater. The potential for groundwater contamination may increase dramatically if the proposed zone is adopted. Steep slopes, stoniness, and shallow depths to bedrock will limit the selection of suitable areas for septic systems. Most of these limitations can be overcome by proper engineering, but engineered systems can be expensive and may be more likely to develop problems. Allowing the residential density to become six times greater would place a heavy burden on the site's marginal soils. Dr. T.L. Holzer, a hydrologist formerly affiliated with the University of Connecticut, has recommended* that residential densities in till-covered areas in eastern Connecticut should not be greater than one unit per acre where both on-site wells and on-site septic systems are required. Greater densities, he estimated, could result in nitrate concentrations in the groundwater that would have adverse effects on health. Where bedrock is close to the surface, as in some parts of the Delgrosso property, the suggested maximum density should probably be less than one unit per acre. Hence, the existing zone seems preferable to the proposed zone.

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.

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* Holzer, 1975, "Limits to Growth and Septic Tanks," in Water Pollution Control in Low Density Areas: Proceedings of a Rural Environmental Engineering Conference, W.J. Jewell & R. Swan, eds., Univ. Press of New England

Upland Soils

The gently sloping to steep landforms adjacent to the highest elevations in the landscape, are occupied by Charlton-Hollis fine sandy loams, very rocky. These soils are designated by the soil symbols 17LC and 17LD. Both soils are well drained. The Charlton soils formed in deep friable glacial till, and the Hollis soil formed in glacial till less than twenty inches deep over bedrock. Charlton soils have moderate to moderately rapid permeability, the Hollis soils have moderate permeability. Surface runoff is medium to very rapid for Hollis soils and medium to rapid for Charlton soils.

The moderately steep and steep slopes at the highest elevations in the landscape, are occupied by Hollis-Charlton-Rock outcrop complex. The soils are designated by the soil symbol 17MD. The Hollis and Charlton soils are well drained. The Hollis soil formed in glacial till less than twenty inches deep over bedrock. Charlton soils formed in deep friable glacial till. The Hollis soil formed in shallow friable glacial till. The Hollis soils have moderate permeability. The Rock outcrop is rock that is exposed. Surface runoff is medium to very rapid for Hollis soils and medium to rapid for Charlton soils.

The gently sloping landforms down from the bedrock-controlled landforms are occupied by Canton-Charlton fine sandy loams. The mapping unit symbol is 11XB. The letter "X" denotes very stony conditions. The Canton soils formed in a fine sandy loam mantle underlain by gravelly sandy glacial till, derived mainly from gravel and gneiss. The Charlton soils formed in deep loamy glacial till. Canton soils have moderately rapid or rapid permeability. Charlton soils have moderate to moderately rapid permeability. Surface runoff is medium in Canton soils and medium to rapid in Charlton soils.

Nearly level to gently sloping landforms at the base of hills are occupied by Sutton fine sandy loam. The soils are designated by mapping unit symbol 41B. Sutton soils formed in loamy glacial till. The soils are moderately well drained, and have moderate or moderately rapid permeability. The seasonal high water table is at 18 to 24 inches. Surface runoff is slow to medium.

Prime Farmlands

According to the U.S. Department of Agriculture classification criteria for Prime Farmland soils, the following soil is classed as Prime Farmland soil: (41B) Sutton fine sandy loam.

Wetland Soils

The low lying, nearly level areas along drainageways in the landscape are occupied by Ridgebury, Leicester and Whitman extremely stony fine sandy loams. The soils are designated by the mapping unit symbol 43M. The Ridgebury and Whitman soils formed in compact glacial till; the Leicester soils formed in friable glacial till. The Ridgebury and Leicester 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 seasonal highwater table for Ridgebury and Leicester soils is at or near the surface 7 to 9 months of the year. The Whitman soil has a highwater table at or near the surface 9 to 10 months 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.

Limitations to establishing septic systems on site will be due to a sizeable wetlands area, very stony to extremely stony surface conditions, very rocky conditions related to shallow soils over bedrock and rock outcroppings, and slopes that range from gently sloping to steep.

The most severely rated soils for on-site septic use are the wetland soils mapped as (43M) Ridgebury, Leicester and Whitman extremely stony fine sandy loams. These soils are poorly and very poorly drained with water tables at or near the surface during most of the year. The wetlands drain north into the town of Montville and are part of the Hunt's Brook watershed which drains south easterly to Miller Pond. Wetland soils comprise about 19 percent of the site.

The Charlton-Hollis very rocky fine sandy loams (17LC, 17LD) have limitations to establishing septic systems due to areas that are shallow to bedrock, and in the case of (17LD), moderately steep slopes. The soils mapped as (17MD) are severely rated for most all uses because of exposed bedrock and sloping to steep slopes. It is important to note that within these mapping units, areas of deep Charlton soils can be found that may be suitable for establishing septic systems. To overcome limitations due to shallow to bedrock conditions, filling in with mineral soils will be necessary. The slope limitations can be overcome by regrading, using fill material and designing systems that utilize the contours of the land.

A pollution hazard will exist where the soils are shallow and unable to adequately filter sewage effluent. This is a hazard to on-site wells which may be located down slope from the leaching fields. Leachate can also enter the wetlands and become a pollutant down stream. Proper well location and engineered systems will be necessary in these critical areas.

The soils in mapping unit (11XB) have moderate limitations due to surface stoniness. Land shaping and the removal of surface stones are methods that can be used to overcome these limitations. There is a small area of moderately well drained soils (41B) found on site. The seasonal high water table is a severe limitation to developing septic systems on these soils. The seasonal high water table is exhibited in early spring and late fall, but will also appear during periods of heavy precipitation. Engineered systems, perimeter drains and possibly additional fill are methods that can be used to overcome these limitations.

The proposed density, one-half acre residential, with on-site wells and septic systems, will be limited as indicated in the preceeding discussion. The most severe limitations, wetlands and rock outcrops on steep slopes, are difficult to overcome and one alternative is to leave these areas undisturbed and as natural areas. These areas comprise approximately 22 percent (8 acres) of the site. The soils that are shallow to bedrock will create a pollution

hazard to nearby wells and to the watershed which can lead to downstream pollution. Some of the lots may not have suitable soils or the necessary square footage of suitable soils to establish on-site septic systems. Up to 20 percent of the site is moderately limited to establishing on-site septic systems, however, these soils are surrounded by soils that are either shallow to bedrock, seasonally wet, sloping or regulated wetlands. The advantages of larger lot sizes are larger areas to locate and establish on-site water and septic systems while minimizing the threat of pollution to adjoining lot owners. Reducing runoff can also be accomplished by larger lots which will allow for more flexibility in locating roads, houses, and storm water control features.

A sediment and erosion control plan will be an important part in the overall plan for developing this area. This is critical because of the sloping to steep slopes that drain toward the wetland. The New London County Soil and Water Conservation District can assist the landowner in developing a sediment and erosion control plan.

VEGETATION TYPE DESCRIPTIONS

The $34^{\pm}$ acre site proposed for zone change may be divided into three major vegetation types. These include two mixed hardwood stands which total $25^{\pm}$ acres, a hardwood swamp area of $7^{\pm}$ acres, and two old field community areas which total $2^{\pm}$ acres. (See Vegetation type map and Vegetation type descriptions.) The largest and healthiest trees present in the mixed hardwood stands should be retained to the greatest extent possible for their high aesthetic value. Windthrow is a potential hazard in the wetland areas. Openings in and along this area will accelerate the loss of trees due to windthrow. A light fuelwood thinning in the wetland area will help to improve tree stability. Vegetation type A and C would also benefit from a fuelwood harvest prior to actual subdivision of this property. The "crop tree selection method" of thinning should be utilized

Type A. (Mixed Hardwoods) Pole to sawtimber-size black oak, white oak, red oak, black birch, red maple and pignut hickory are present in this $22^{\pm}$ acre over-stocked stand, along with scattered tulip tree, yellow birch and American beech. The trees in this stand are declining in health and vigor as a result of their crowded condition. Total volume of the stand ranges between 18 and 22 cords per acre.

The understory is dominated by mountain laurel, flowering dogwood, witch hazel, blue beech, sassafras and hop hornbeam. The groundcover consists of bracken fern, Christmas fern, striped pipsissewa, rattlesnake plantain, club moss, huckleberry, low bush blueberry and greenbrier.

Type B. (Hardwood Swamp) Poor quality pole to sawtimber-size red maple along with scattered black gum, white ash and yellow birch are present in this $7^{\pm}$ acre fully-to-overstocked stand. A dense understory consisting of spicebush, high bush blueberry, sweet pepperbush and occasional mountain laurel is also present. Greenbrier, Christmas fern, and cinnamon fern make up the groundcover in this area, with sphagnum moss, tussock sedge, skunk cabbage and false hellebore in close proximity to the stream.

Vegetation

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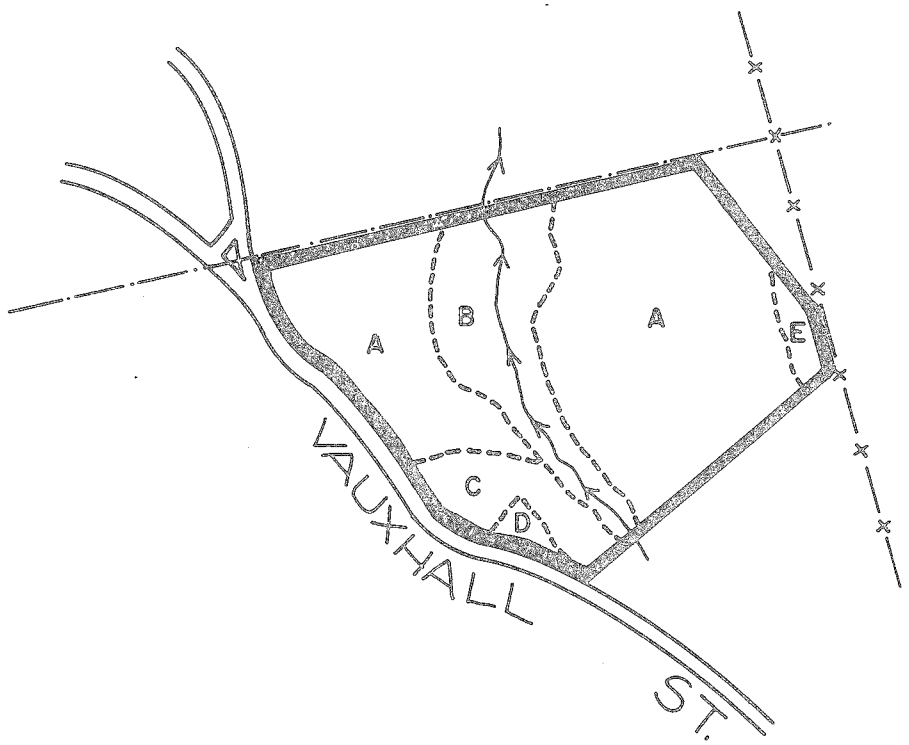
scale

N



LEGEND

- Road
- Property Boundary
- Vegetation Type Boundary
- Town Line
- Utility Line
- Stream

VEGETATION TYPE DESCRIPTIONS*

TYPE A. Mixed hardwoods, 22±acres, over stocked, pole to small sawtimber-size.

TYPE B. Hardwood swamp, 7±acres, fully stocked to over stocked, pole to sawtimber-size.

TYPE C. Mixed hardwoods, 3±acres, over stocked, sapling to pole-size.

TYPE D. Old field, 1±acre.

TYPE E. Old field/power line, 1±acre, old field species.

* Seedling-size = Trees less than 1 inch in diameter at 4 1/2 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.

Type C. (Mixed Hardwoods) This 3± acre over-stocked stand is made up of sapling to pole size black oak, white oak, black birch, yellow birch and American Beech. The total volume in this stand ranges between 13 and 16 cords per acre. Gray birch, blue beech, witch hazel, flowering dogwood and maple-leaf viburnum are present in the understory. The groundcover is made up of grasses, club moss, Christmas fern, huckleberry and low bush blueberry.

Type D. (Old Field) An open field, approximately one acre in size, is located within this tract. It is vegetated with grasses, goldenrod, milkweed, oriental bittersweet and raspberry. Multiflora rose and smooth sumac are becoming established, but are not widespread.

Type E. (Old field/Powerline) Hardwood tree species have been removed from the one acre Power Line Right-of-Way which is located on the eastern boundary of this tract. Vegetation present is made up of sweet pepperbush, mountain laurel, bayberry, sweet fern raspberry, grasses, joe-pye-weed and goldenrod. The vegetation in this area is periodically exposed to herbicide by the Utility Company.

Many of the larger, healthier trees which are present in vegetation types A and C (mixed hardwoods) have high shade and aesthetic value. These trees should be selected for retention prior to development of this property. The number of trees that can be successfully retained per acre will depend upon the individual lot size. The smaller the lot size the fewer trees may be retained, because a larger percentage of each lot must be cleared for building. Recent research has shown that healthy trees on a house lot my enhance the value of that lot by as much as twenty percent.

The rockiness of portions of this tract will necessitate extensive excavation, filling and grading for construction of roadways, septic systems and buildings, especially at the high density which is proposed in the zone change. It should be noted that these practices will disrupt the balance between soil aeration, soil moisture level and soil composition. Trees are very sensitive to such soil changes within the entire area under their crowns. These disturbances may cause a 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. Dead trees reduce the aesthetic quality of an area and may become hazardous and also expensive to remove if near roadways, buildings or utility lines. Care should be taken during the construction period not to disturb the trees that are to be retained. In general, healthy and high vigor trees should be favored over unhealthy trees because they are usually more resistant to the environmental stresses brought about by construction.

When feasible, trees should be saved in small groups or "islands." When lots are half acre and smaller, these "islands" may be located between lots. This practice lowers the possibility of soil disturbance and mechanical injury. Individual and "islands" of trees should be temporarily, but clearly, marked so they may be avoided during construction.

Windthrow is a potential hazard in vegetation type B (hardwood swamp). The soils in this area are saturated with water for the greater part of the year, causing soil aeration to be poor. These conditions result in the establishment of shallow root systems which are usually unable to securely anchor trees. The potential for windthrow and top damage is intensified by the crowded condition of the trees in this stand. It should be noted that any clearing in or along

side this area will accelerate the loss of trees to windthrow by allowing wind to pass through, rather than over, this stand.

Raising the water level in the hardwood swamp by blocking or restricting natural flows may result in considerable mortality of the trees, shrubs, and herbaceous vegetation now growing in this area. If roads are constructed through this area, they should be designed in such a way that natural flows are not restricted.

Suggested Management Practices

The trees in the above-mentioned hardwood swamp are crowded. As a result, they are very susceptible to weather, disease and insect damage. A light fuelwood thinning in this stand, removing approximately one-quarter of the trees in the overstory will help to reduce the crowded condition and improve the stability of the residual trees over time. This thinning should be focused on removing the poorest quality trees (damaged trees, trees with excessively small crowns, etc.) and trees which are directly competing with high quality trees. All tree species other than red maple should be favored during this thinning. To avoid extensive soil damage, this thinning should take place during the winter months when the ground is frozen or during the summer months when the ground is dry.

The trees in vegetation type A and C (mixed hardwoods) are starting to decline in health and vigor as a result of their crowded condition. Under these circumstances, the trees are under stress, and major disturbances in their environment, such as changes in soil conditions and mechanical injury caused by construction in this area, will rapidly lower their health. Fuelwood thinnings in these stands following the "crop tree selection method" (preferably prior to construction), would reduce the competition between residual trees for space, sunlight, nutrients and water and result in healthier more stable stands over time. The healthier stands would be better able to withstand any new stresses brought about by development.

Under the "crop tree selection method," 100 of the highest quality trees in each acre should be identified (trees spaced about 20' x 20' will equal 100 trees per acre), and one, two, or three trees that are in direct competition with each of those identified should be removed. The 100 trees per acre that are selected as crop trees should be healthy, large crowned, and show little or no signs of damage. Trees which are not competing with the 100 selected trees should not be removed, unless they are severely damaged. This thinning, if implemented, will provide approximately 6 cords of fuelwood per acre from vegetation type A, and approximately 4 cords per acre from vegetation type C. Access for the purpose of thinning may be limited by rockiness in the northwestern corner of this tract.

Ideally, these thinnings should take place several years prior to the development of this property. This time would allow the residual trees to become more stable. If this tract is subdivided into half-acre lots, these thinnings, although still desirable, will not be necessary because of the extensive clearing which would take place.

A public service forester or private forester should be contacted to help select crop trees and mark the trees which are to be removed, if suggested thinnings are desired by the landowner.

WILDLIFE

The Delgrosso property is entirely forested at present. The quality of this woodland habitat for wildlife is good. The area provides elements of habitat for birds, mammals, and game species such as white-tailed deer, raccoon, ruffed grouse, chipmunk, gray squirrel, oppossum and seasonal songbirds.

During the field review, white-tailed deer were sighted, as well as a variety of songbirds. Evidence of tracks, greenbriar browse, and droppings indicate that the site is heavily utilized by deer.

The small wetland area and streamcourse which bisect the property provides habitat for many species of water-loving birds and mammals and a water source for other animals. Efforts should be made to preserve good water quality and maintain the integrity of the system.

A zone change and subsequent development as proposed will eliminate habitat for deer and other native woodland wildlife. However, the presence of undeveloped woodland adjacent to the property may help to reduce the impact on local wildlife. Urbanization generally eliminates the suitability of the habitat for local wildlife. The result is an increase in urban wildlife forms, more at ease with human intrusion into their habitat. These species would include, but are not limited to; raccoon, skunk, oppossum, gray squirrel, mice, dogs, cats, rabbits, and seasonal songbirds.

WATER SUPPLY

Although public water and sewage disposal are or will be available in the near future for considerable portions of Waterford, the property in question is beyond the area to be serviced by these public facilities. Therefore, any future development would be served by both private on-site water supplies and subsurface sewage disposal systems.

If individual on-site wells are used to provide drinking-water to the property, bedrock would be the only suitable aquifer. Bedrock wells can usually supply small but reliable quantities of groundwater that are sufficient to meet the needs of an average family (generally about 3 gallons per minute). Bedrock transmits groundwater along fractures. The yield of a given well, therefore, depends upon the number and size of water-bearing fractures that the well intersects. Most of the fractures in bedrock are concentrated in the upper 100 to 200 feet. As a rule of thumb, it is recommended that wells be spaced twice as far apart as the width of the aquifer they tap. This recommendation is made to lessen the danger of mutual interference; that is, a situation where drawing down the water level in one well by pumping causes a drawdown in a nearby well. With bedrock, the recommended spacing is about 300 feet. It is unlikely that half-acre lots could allow this spacing.

It is generally recognized that where a site has both an individual well and sewage disposal system, a minimum of one acre should be provided. Where land and soil conditions have various limitations for subsurface sewage disposal such as: excessive slope; surface or shallow bedrock; high groundwater; relatively impervious soil; or a substantial amount of wetlands, it is prudent to have larger lots. This is particularly true in the case where sewers are to be avoided for the long term and safe drinking water quality is to be maintained.

Individual on-site wells for the proposed zone change to half-acre lots would not be recommended. A development that would have relatively small lots should be serviced by a community public water supply system. A well(s) for a possible public supply must be properly located and have adequate separating distance(s) from any potential sources of pollution. The well(s) must supply sufficient water for the needs of the project. Thus, the need for requiring substantial yield test on any well.

Public water supplies from wells would be under the jurisdiction of the Public Water Supplies Section of the State Department of Health Services. This section should be contacted regarding any potential well(s) site and for other necessary material, information, plans and specifications relative to obtaining the approval for such a water system.

WASTE DISPOSAL

In general, with the exception of a limited area of approximately 6 acres located on the east side of the watercourse and wetlands which cross the property, the parcel has or could have, depending upon the depth to bedrock, severe limitations for on-site subsurface sewage disposal. Sloping terrain along with numerous surface stones, particularly in the western portion of the property, are other factors.

A number of soil tests were made several years ago along the upper fron (western) part of the property near Vauxhall Street Extension. The findings (depth to ledge, percolation rates) were generally satisfactory. However, due to the nature of the terrain, the area tested represents a relatively small usable section of the overall property. Certainly a more comprehensive testing program would be necessary in order to evaluate the entire tract.

Based on general observations and soil mapping data, the site does not appear to be particularly favorable for on-site sewage disposal. Therefore, there are serious reservations regarding a possible zone change which would allow a substantial increase in the overall development density of the property, leading to a greater opportunity for potential sewage disposal and drainage problems.

LAND USE AND DESIGN CONCERNS

The area of the proposed zone change is recommended for low density uses in the Regional Development Plan and for rural density uses in the Waterford Town Plan. The adjacent area in Montville is recommended for low density-conservation uses in the Montville Town Plan and is zoned for residential three-acre lots. Based on this, half-acre lot sizes appear inappropriate for this

section of Waterford. This is especially true if Waterford wishes future development to follow a sewer avoidance program in the northwest section of town. Small lots and soil conditions (wetness, depth to bedrock, stoniness) could present future problems for on-site sewerage systems and wells. The main purpose of a sewer avoidance approach is to avoid the future installations of public sewers. Reportedly, homes on small lots along Turner Road immediately adjacent to this area in Montville have had sewerage problems in the past.

This change from three-acre per unit to one-half acre per unit not only represents a six fold increase for on-site utilities, but also a potential six fold increase in traffic generated by the development. Vauxhall Street is a narrow collector street in this section of town. From 1976 to 1979, Vauxhall Street had the greatest number of accidents for a local street in Waterford. No improvements are listed in the Regional Transportation Plan for this street.

Nearest municipal facilities (school and fire) are located about three and one-half miles south of the site on Dayton Road. The Montville Fire Department located at Route 85 and Chesterfield Road is probably slightly closer than the Waterford facility.

One approach for development of the area could be use of Waterford's cluster provisions (R-40 and R-120 zones) which would reduce lot requirements by 25% and still accommodate utilities on-site. The overall density would remain at that required by the existing zone. This approach would permit residences to be located on the areas with the best soil conditions.

Appendix

Soils

0 660'
SCALE

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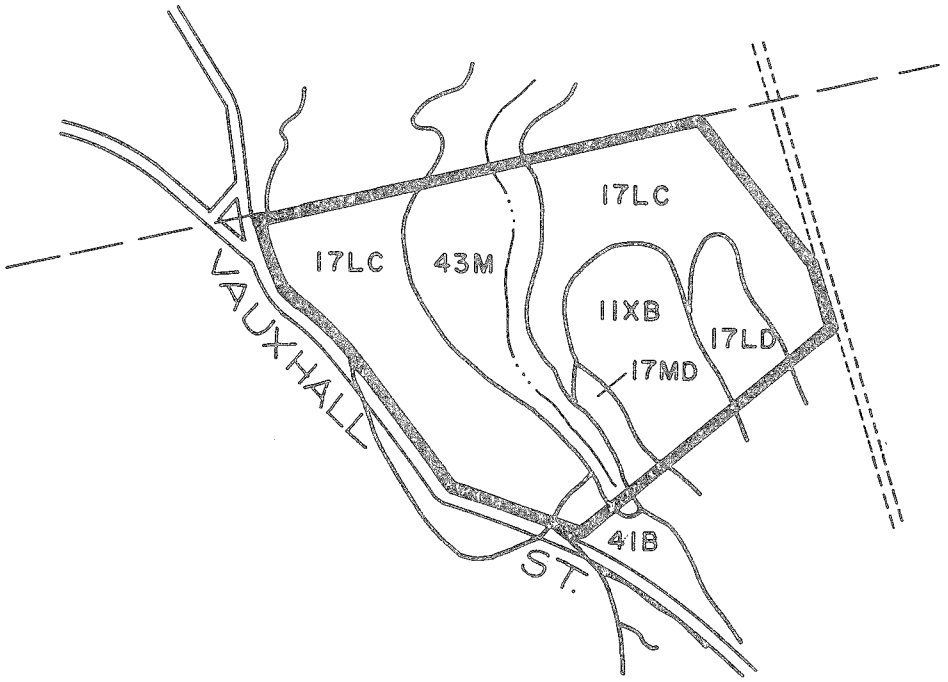

DELGROSSO ZONE CHANGE
WATERFORD, CONNECTICUT

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
Canton-Charlton	11XB	6	16	large stones	2	2	2	2
Charlton-Hollis	17LC	19	51	slope,				
Charlton part				large stones,	2	2	2	2
Hollis part				depth to rock	3	3	3	3
Charlton-Hollis	17LD	3	8	slope, depth to rock	3	3	3	3
Hollis - Rock Outcrop	17MD	1	3	slope, depth to rock	3	3	3	3
Ridgebury, Leicester, Whitman	43M	7	19	wetness, large stones, frost action	3	3	3	3
Sutton	41B	1	3	wetness, frost action	3	3	2	1
		37	100					

* Limitations - 1=slight, 2=moderate, 3=severe
** Regulated wetland soil under Public Act 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.