Environmental Review Team Report

Stonecroft

Hebron, Connecticut

R C & D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report

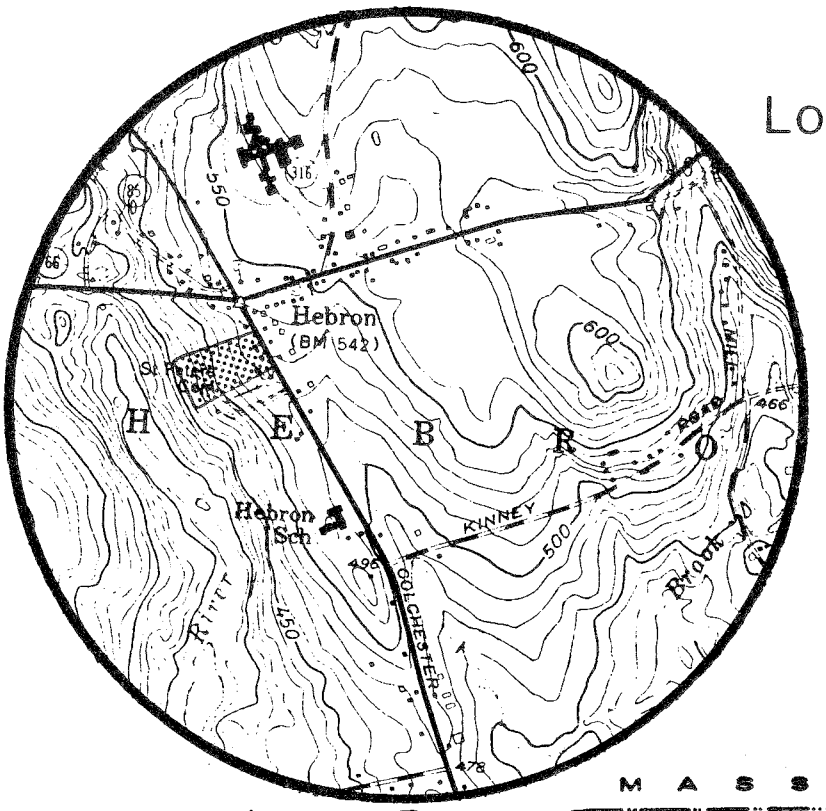
Stonecroft
Hebron, Connecticut

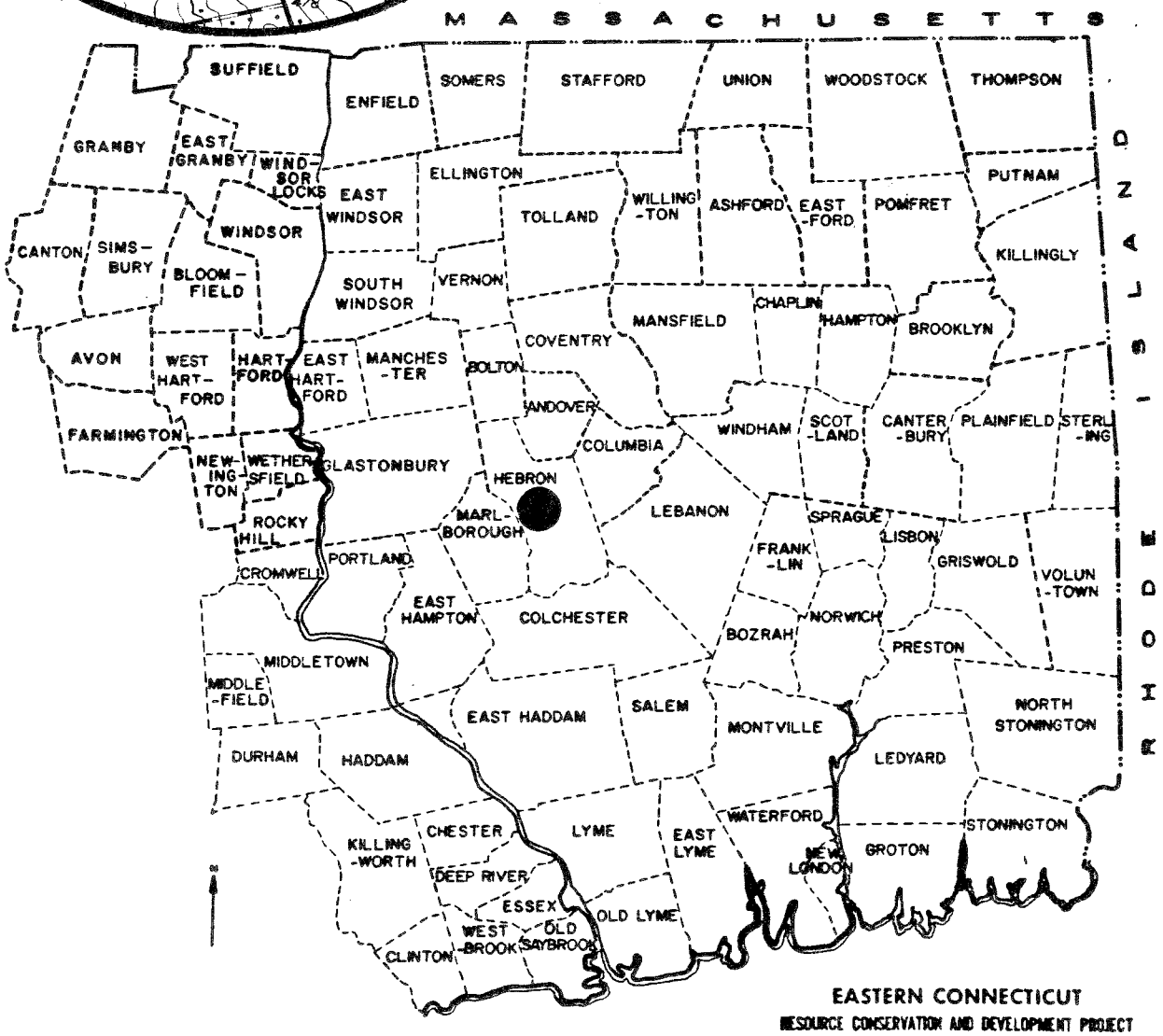
February 1984

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

Location of Study Site

STONECROFT
HEBRON, CONNECTICUT





EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
STONECROFT
HEBRON, CONNECTICUT

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

The soils of the site were mapped by a soil scientist from the United States Department of Agriculture, Soil Conservation Service (SCS). Reproductions of the soil survey map, a table of soils limitations for certain land uses and a topographic map showing property boundaries were distributed to all Team members prior to their review of the site.

The ERT that field-checked the site consisted of the following personnel: Joseph Neafsey, District Conservationist, SCS; Jim Parda, Forester, Connecticut Department of Environmental Protection (DEP); Bill Warzecha, Geologist, DEP; John Rook, Wildlife Biologist, DEP; Don Capellaro, Sanitarian, State Department of Health; Christopher Singley, Planner, Capitol Region Council of Governments; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

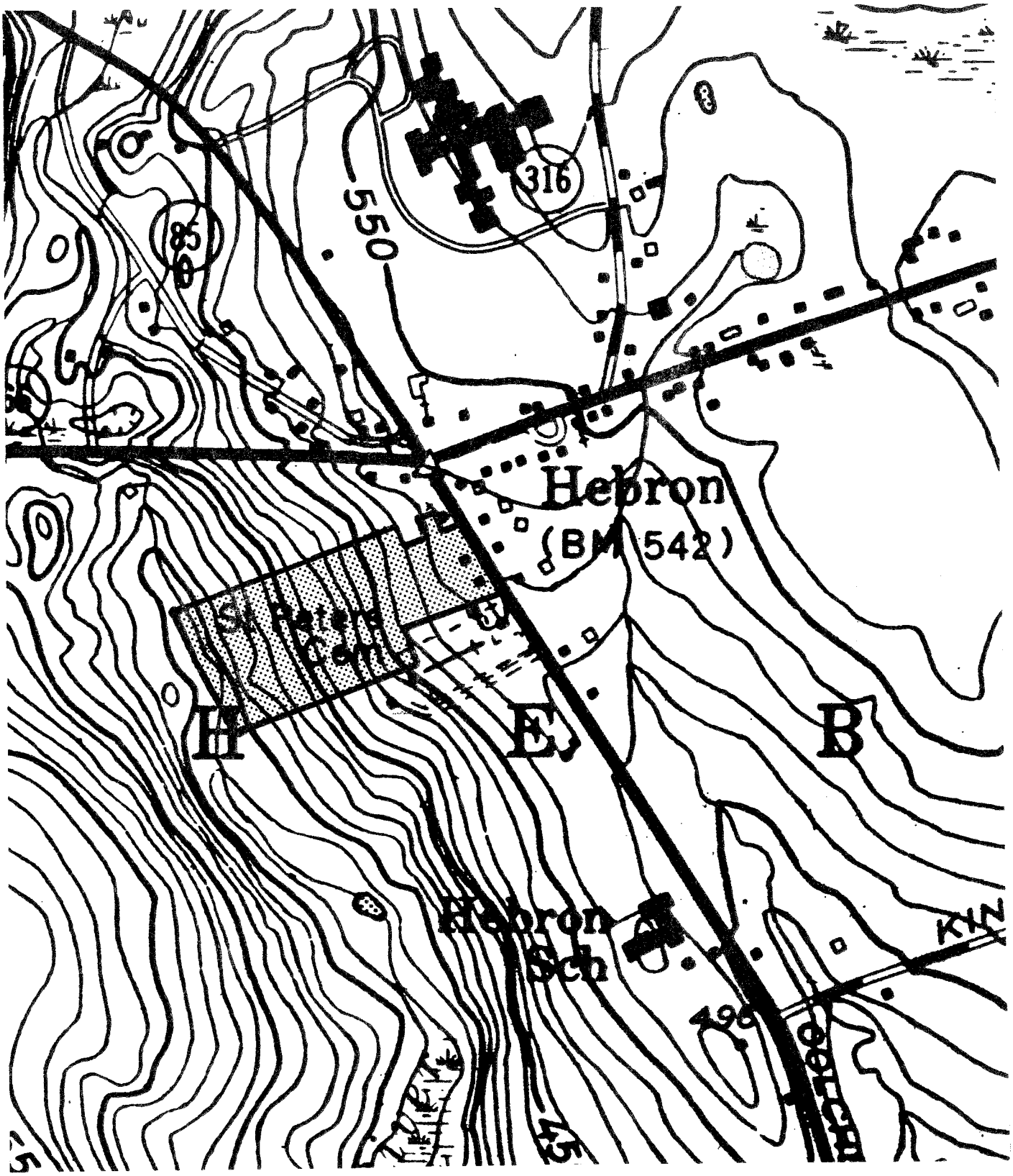
The Team met and field-checked the site on Thursday, December 8, 1983. Reports from each contributing Team member were sent to the ERT Coordinator for review and summarization for the final report.

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 Hebron. 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 Area 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, Rte. 205, Brooklyn, CT 06234, 774-1253.

Topography	Site Boundary	0 660' scale	N



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a housing development proposal in the Town of Hebron. The study site is approximately 17 acres in size and is located on the west side of Route 85, south of its intersection with Route 66. Preliminary development proposals have been prepared by Megson and Heagle, a civil engineering firm in Glastonbury.

Two plans have been proposed for the site. Plan A shows a typical 13 lot subdivision, with a minimum lot size of one acre. Each unit will be served by separate on-site septic systems and individual on-site wells. A single road extending west from Route 85, ending in a cul-de-sac, will provide access to the lots. Plan B shows a Planned Unit Development (P.U.D.) approach. Approximately 15 acres of the site will be developed at a 3.4 unit per acre density. Twenty-one, one bedroom units and ±31 two bedroom units, concentrated in seven clustered buildings are proposed for the site. The units will be served by two community on-site septic systems and an on-site well(s). A road, extending west from Route 85, temporarily ending in a cul-de-sac will provide access to the buildings. This road may be extended to Route 66 in the future. One hundred twenty-one parking spaces will be provided on-site. At present, the town zoning ordinances require a minimum of one acre per building lot. A zone change for the property and a change in the Hebron Zoning Regulations will be necessary before Plan B could be considered for implementation.

The site is steeply sloping, broken by a series of small terraces, from Route 85 down to Jeremy Brook (a tributary of the Salmon River). Soils on the site consist primarily of well-drained glacial till soils. Vegetation on the site is comprised of "old field" species and a number of large trees which grew up along the stone walls which divided the fields. At the present time, there is an existing older house located on the eastern side of the property near Route 85. Several farm outbuildings and an unused in-ground swimming pool are also situated to the west of the house, near the southern property line.

The Team is concerned with the effect of the proposed development on the natural resource base of this site. Although some sites have severe natural limitations to development, these limitations can be overcome with proper engineering techniques. These measures, however, can become costly, making a project financially unfeasible for a developer. The major limiting factors to development of this parcel are slope, depth to bedrock, rapidly percolating soils and proximity to Jeremy Brook and its associated wetlands.

Possible mitigation measures are discussed in the following sections of this report. During the post review discussion, the Team came to the general consensus that Proposal B would have the least detrimental environmental effect, as most of the environmentally sensitive land would be avoided during development. Proposal A, alternatively, shows the entire site, including the wetlands/Jeremy Brook area divided into single family lots. The following sections of this report discuss the Team's concerns in greater detail.

ENVIRONMENTAL ASSESSMENT

TOPOGRAPHY

The ±17 acre "Village Residential" site is an irregularly shaped parcel of land located on the west side of Route 85 about 600 feet south of the intersection of Route 85 and 66. It consists predominantly of open fields and is characterized by a terraced topography. Land surface rises from west to east. Slopes on the site are gentle throughout the eastern third, but become moderate to steep throughout the central and western portions. Average slopes within the site are approximately 16 percent. Elevations on the property rise from about 400 feet above mean sea level along the westernmost property line to approximately 535 feet above mean sea level along Route 85 at the eastern limits of the site. No watercourses were visible on the property during the site review.

GEOLOGY

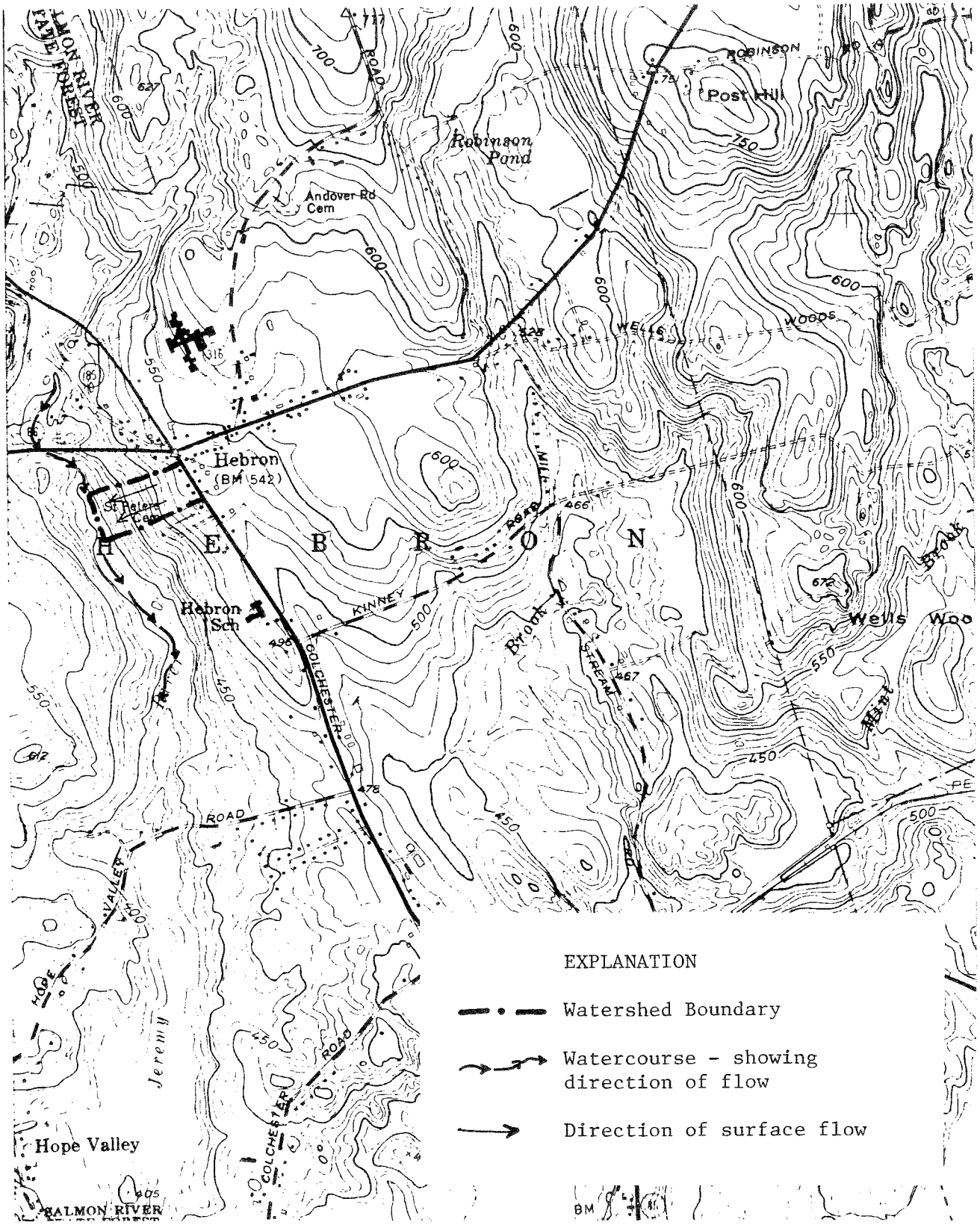
The parcel lies entirely within the Columbia topographic quadrangle. A bedrock geologic map (GQ-592) for the quadrangle was prepared by George Snyder and published by the U.S. Geological Survey. The surficial geologic map for the quadrangle by Michael A. Zizka has not been published to date. However, preliminary information from the unpublished map was reviewed for the purpose of this report.

No bedrock outcrops are found exposed on the site. Based on the project engineer's deep test hole information, bedrock was encountered in two test holes at about 6 feet below ground surface in the northern portions of the site. It was also encountered at greater depths (about 7 and 8 feet below ground surface) in the southeast portions. Depth to bedrock is probably not more than ten feet throughout the parcel.

The bedrock underlying the site is described as a medium grained, gray to white oligoclase-orthoclase-quartz-biotite granodiorite gneiss. "Gneisses" are crystalline, metamorphic rocks characterized by banding. The term metamorphic is used to describe rocks which have been altered by great heat and/or pressure. A gneiss is commonly composed of layers of granular minerals such as quartz and feldspar alternating with generally narrow bands of well-foliated prismatic minerals such as mica and hornblende. This mineral arrangement gives the rock its "banded" appearance. The granular layers are commonly light colored, i.e., tan, white, light gray or pink, while the foliated beds are commonly dark, i.e., dark gray, black, etc.

The unconsolidated material overlying bedrock on the site is till. Till is a glacial sediment which was deposited directly by glacier when the ice melted away. It consists of round to angular rock fragments of widely varying sizes. The texture of till varies greatly at depth and from place to place. Based on deep test hole data compiled by the project engineer, it appears that the till in the upper few feet is generally sandy, stony and loose while at depth (greater than 3 feet) it becomes harder, moderately compact and finer grained.

Drainage Areas



From a geological perspective, it appears the most limiting factors in terms of either proposal "A" or "B" are the presence of moderate to steep slopes in the central and western portions of the site and till soils which cover the entire site. Excessive slopes will weigh heaviest on the installation of subsurfce sewage disposal system(s), placement of interior roads and potential erosion problems. Because till soils commonly become compact at depth, they tend to restrict the downward movement of groundwater, resulting in less rapid subsurface drainage, which affects the functioning of subsurface sewage disposal systems. While these geological characteristics do represent limitations, it seems likely that they could be surmounted with good planning and engineering, proper installation and continued maintenance.

HYDROLOGY

All drainage from the property flows by sheet flow southwestward into Jeremy Brook. The watershed which is slightly larger than the parcel itself, drains a small area of only ±21 acres or .03 square miles. Wetlands border the western limits of the site, along the Salmon River.

Development of the site would lead to increases in runoff and unless mitigating measures were used, possibly increase the peak flows to Jeremy Brook. The percentage increase in peak flows would be greatest near the site, diminishing gradually downstream. The increases would be caused mainly by the removal of vegetation, compaction of soils during construction, and the creation of impervious surfaces such as roofs, parking areas, interior roads and driveways, covering otherwise permeable soils.

An estimate may be made of runoff increases that would be experienced following development under proposal "A" (standard subdivision, one acre lots) and proposal "B" (clustered development). As a result, it allowed the Team to compare runoff volume increases from the two proposals. The results are shown in an accompanying table. The runoff estimates are based on a simplification of the Soil Conservation Service Technical Release No. 55. The method involves the determination of runoff curve numbers which relate amount of precipitation to amounts of runoff.

Rainfall data was derived from U.S. Department of Commerce and Weather Bureau publications. Rainfall figures are indicative of four different storms, i.e., 10, 25, 50 and 100 year storm, with each figure representing an amount that would occur within a 24 hour period. It must be remembered that the figures shown in the accompanying table are meant only to indicate the prospective magnitude of the increases; they are not desired to indicate absolute flow rates which may be significantly greater or less than the corresponding estimates.

TABLE I - Runoff estimates for different storms in a one acre standard subdivision (Proposal 'A') and in a cluster subdivision (Proposal 'B') with the same total land areas.

AVERAGE STORM FREQUENCY	10 YEAR STORM	25 YEAR STORM	50 YEAR STORM	100 YEAR STORM
Runoff before development, in inches	1.19	1.61	2.06	2.54
Runoff after development, under proposal 'A' one-acre standard subdivision, in inches.	1.88	2.41	2.96	3.53
Percent increase	60%	50%	44%	39%
Runoff after development, under proposal 'B' cluster subdivision, in inches	1.52	1.79	2.50	3.02
Percent increase	28%	24%	21%	19%

It is estimated that development under proposal "A" would increase the curve number on the site by 11 (from 60 to 71) and by 5 (from 60 to 65) under proposal "B". As the table indicates, a cluster type subdivision as discussed on the review day would lead to a lower percentage increase in runoff than the one acre lot subdivision. As a result, it appears that the cluster subdivision concept would have a hydrological advantage over the standard one acre lot subdivision. It should be noted any change from the type of clustering discussed, such as clearing of additional wooded area for recreational facilities or any other type of changes would partially effect the differences in runoff from the subdivision.

Because of the increased runoff volumes, the soil type, and moderate to steep slopes, which characterize the site, it seems likely that additional sediment may be carried away from the site particularly during the construction phase. For this reason, sediment control would be needed to prevent increased loading of the Salmon River, which drains the site. Therefore, it is strongly recommended that a comprehensive erosion and sediment control plan be developed covering each stage of the proposed project. Also, the figures shown in the table suggests that peak flow increases in the Salmon River may be expected following development of the site. Therefore, it is recommended that a judicious stormwater management plan be formulated and implemented for development on the site. Consideration should be given for the installation of a detention pond in the western limits of the property. A detention pond may also serve a sediment retention function. If sediment does accumulate in the pond, the material should be removed periodically. Proper maintenance of the retention pond will assure that the runoff storage capacity of the pond is not diminished. For this reason, it should be determined in advance who would provide for the proper maintenance of the pond or ponds (i.e., homeowners association, developers, Town of Hebron, etc.).

SOILS

A detailed soils map of this site is included in the Appendix to this report accompanied by a chart which indicates soil limitations for various urban uses and detailed soils descriptions. 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 for each of the soils for on-site sewerage, buildings with basements, buildings without 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 Soil Survey, Tolland County, Connecticut, 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.

The soils in the proposed areas consist of well-drained, non-stony to very stony soils formed in loamy glacial till. Slopes range from 3 to 35 percent. Permeability test pits were observed by Megson and Heagle to determine the probability of community subsurface sewerage disposal systems.

Approximately 4 acres along the eastern boundary of the site is classified as prime farmland. "Prime farmland" are those soil types that have the best combination of physical and chemical characteristics for producing food. This area had been used as improved pasture or hayland and is now idle.

Two methods of development were proposed for this site. Proposal "A" indicated single family dwellings, totaling 65 bedrooms, each dwelling with a subsurface disposal system. Proposal "B" showed a Planned Unit Development project (P.U.D.) to accommodate up to 83 bedrooms. The P.U.D. would be served by two separate on-site community sewage systems.

If Project "A" is implemented, slope could be a limiting factor in the installation of septic tank absorption fields. Serial tile distribution is one management practice that would allow effluent to flow on the contour and flow slowly through the tile and disperse properly over the absorption field. Controlling the downhill flow of the effluent may be a serious problem. Improperly filtered effluent may reach the surfce at the base of the slope, and wet, contaminated seepage spots may result. Absorption fields on lots 6 and 7 could present some problems to the brook below the lots if unfiltered effluent escaped.

Ground water and mottling were found at various depths in the test pits in lots 6, 8, 10, and 11. Interceptor drains, sand filters or large septic leaching fields may be needed to facilitate a properly functioning system.

If the Planned Unit Development project (Project "B") is implemented, there are still many of the same limitations as for a standard subdivision. The two on-site systems that are planned would be limited by the steep slopes and would need careful planning in controlling downhill flow of effluent. Again a serial tile distribution system may be needed to alleviate the problem. The larger septic field shown on the P.U.D. Plan will be installed in an area that is very steep and the lower end of the system is approximately 275 to 300 feet from Jeremy Brook. The test pit dug in this area of the proposed septic system indicated that mottling occurred at 39 inches and ground water was at 48 inches.

Stormwater Management

A detailed stormwater management and runoff control plan should be developed for both the standard subdivision proposal and the P.U.D. This should include road and parking area runoff, roof runoff, curtain drains and measures to control hillside runoff. Careful planning is necessary to provide safe disposal of stormwater.

Erosion and Sediment Control

A detailed erosion and sediment control plan should be developed and implemented for the site. This plan could be integrated into the stormwater management plan. The Connecticut Erosion and Sediment Control Handbook is an excellent guide for plan development. The best way to control sediment is to prevent erosion, and the proper measures need to be installed to prevent erosion during construction. It is very important to protect Jeremy Brook and the wetlands below the site.

The site appears to be suitable for the Proposal "A" if adequate septic systems can be designed and if a site plan for the subdivision can be developed that implements measures to control stormwater, and control erosion on the steep slopes.

The site also appears to be suitable for a P.U.D. project if adequate septic systems can be designed, and if a site plan for the P.U.D. can be developed that implements conservation measures to control stormwater and control erosion on the slopes.

The P.U.D. plan takes advantage of the natural landscape. The road is designed with the contour of the hill and the units will be built on the terraced topography. It appears that less area will be disturbed during construction of the units and a buffer will be left below the units and Jeremy Brook. This area will facilitate the construction of a sediment/retention basin to collect runoff and sediment.

On request, the Tolland County Soil and Water Conservation District can provide technical assistance to the project engineer on development or revision of erosion and sediment control and stormwater management plans.

VEGETATION

The tract proposed for subdivision can be divided into 3 different areas. Approximately 2 acres are existing houselot, 7 acres are hayfield, and 8 acres are abandoned old field dominated by juniper and shrubs. The 15 acres of abandoned old field and hayfield is divided into 6 areas each separated by a hedgerow of hardwood trees (sugar maple, red maple, white ash, oaks, black cherry, apple and butternut).

Vegetation Descriptions

TYPE 1: (Hayfield - 7 acres) Composed of grasses, burdock, meadow sweet.

TYPE 2: (Abandoned Old Field - 8 acres) Composed of juniper, multiflora rose, grasses, apple trees, autumn olive, raspberry, bittersweet, red cedar, barberry, speckled alder, poison ivy.

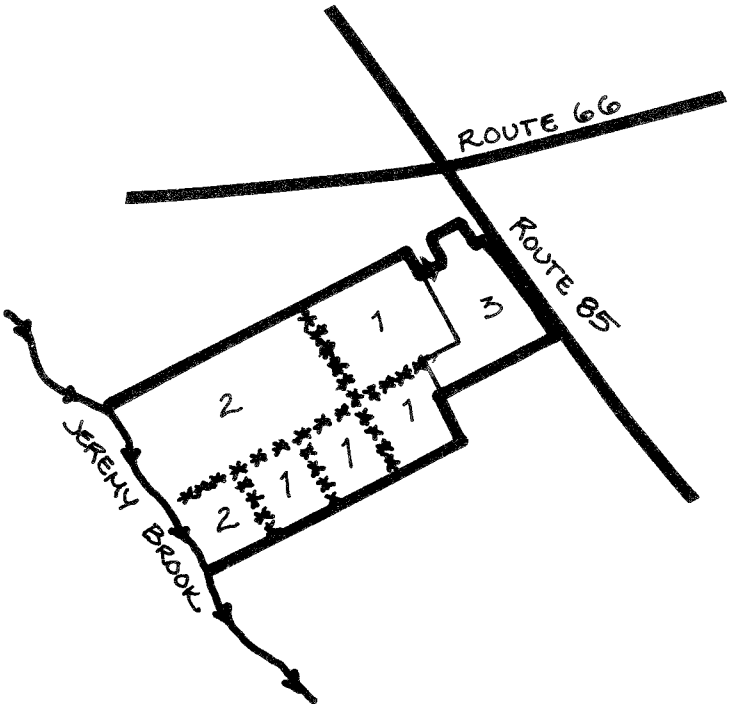
TYPE 3: Houselot - Abandoned Farm - 2 acres.

Aesthetic Considerations

If Proposal "A" is followed and single family homes are constructed, all the large trees with high aesthetic value in the hedgerows will have to be cut down and sold as fuelwood because the large amount of excavation would either cut the tree roots considerably or cover them over with a thick layer of soil. Both of these occurrences would soon kill the large trees.

If Proposal "B" is followed and a cluster development is built, selected individual trees can be retained. Large, well formed, symmetrical trees should be avoided by machinery. Trees are sensitive to the condition of the soil within the entire area under their crowns. Excavation, filling, and grading for construction of roads and buildings can disturb the balance between soil aeration, soil moisture level, and soil composition. These disturbances may cause a decline in tree health and vigor resulting in possible mortality within 3 to 5 years. Mechanical injury to trees may cause the same results. Dead trees reduce the aesthetic quality of an area and may become hazardous and expensive to remove if near roadways, buildings or utility lines.

Vegetation



EXPLANATION

*** Hedgerow

Property Boundary

Asphalt Road

Stream

VEGETATION TYPE DESCRIPTIONS

TYPE 1 Hayfield (7 acres)

TYPE 2 Old Field (8 acres)

TYPE 3 House Lot

Care should be taken during construction not to disturb trees designated for retention. Trees such as sugar maple, well-formed red maple and white ash offer good variety in autumn color. Black cherry, apple and butternut offer a food source beneficial to a variety of wildlife which would inhabit a residential area.

Limiting Conditions/Potential Hazards

Many of the hedgerow trees are malformed, rotten or hollow. These trees represent a potential hazard if not removed prior to development (Proposal "B"). Trees chosen for retention should be clearly designated prior to construction so machine operators take necessary care to avoid roots and trunks. Trees damaged during construction could possibly die and become a hazard 3 to 5 years after the development is complete.

Under Proposal "A", limiting conditions and hazards would be minimal as the entire area would be cleared of vegetation and replanted.

In either proposal, the barbed wire in the trees and stonewalls pose a hazard during tree felling and removal.

WILDLIFE

The project site is approximately 17 acres in size. It consists primarily of old and open fields. The western end of the property is brushy and wooded. Stonewalls are found at field edges, they are surrounded by brushy growth. Old trees (oak, maple, ash, and apple) are found throughout the property, usually at field edges. Juniper is very common and is very thick toward the western end and is scattered throughout much of the central section. Shrubs such as autumn olive, winterberry, bittersweet, japanese barberry, multiflora rose, and speckled alder are found throughout the property. A small river runs along the western border; a small pool is found there. A hardwood swamp is found west of the property boundary.

This property provides an excellent quality wildlife habitat. The fields, with the scattered juniper and the wide variety of other shrubs, provide excellent cover. The berries, buds, and stems provide substantial wildlife food. Deer, grouse, rabbit, raccoon and other small mammals and birds will find this area attractive. The old, spreading trees, some with hollowed cavities, serve as nesting and den sites. The fields attract insects which provide additional wildlife food. The stonewalls provide refuge to small rodents. The brushy growth near the walls and at field edges will be used as protective cover and food by wildlife. It appears that deer are quite common on this property due to the abundance of tracks, scats, and evidence of brouse. The hardwood swamp provides nesting habitat for various waterfowl. Beaver are also living in the wetlands.

Both development proposals, to some degree, will be detrimental to wildlife. The cluster development would seem to be the best development choice from the wildlife perspective, as the western section of the property, which is heavy with cover, would not be used. The field habitat will be eliminated and the development there will reduce wildlife usage in the lower section.

If the single family subdivision alternative is chosen, wildlife usage would essentially be lost from the property as the entire site would be developed. Development will also negatively effect wildlife usage in adjoining areas. Adverse conditions that may arise from the septic systems must also be considered. The closer the septic systems are to the river, the greater the risk of water contamination. This would cause problems wherever the river flows.

As previously stated, the cluster development would be less detrimental to wildlife usage of the site. In addition to leaving the western end of the site untouched, the entire area could be landscaped (plant shrubs and evergreens) which would be aesthetically pleasing and could also supply some food and cover for any animals that may venture into the area. Large "wolf" and cavity trees should remain where possible. Shrubs and brushy sections should also be preserved, especially at field edges. Stonewalls should be left intact where possible.

WATER SUPPLY

Since no public water supply line is available to the site, an on-site water supply well or wells would have to serve the proposed development. Because no extensive sand/gravel deposits are present on the site, it appears the underlying bedrock is the only suitable aquifer for such well or wells on the property. Water is supplied to a bedrock based well primarily through fractures in the rock. Because of the uneven distribution of the fractures, it is very difficult to predict the potential yield from any new well without expensive geophysical testing.

Under proposal "A", water supplies to thirteen single family dwellings in the subdivision are proposed to be provided by individual wells. A yield of at least 3 gpm (gallons per minute) is desirable and is adequate for most household needs. In a survey of 314 wells in the lower Connecticut River basin, it was found that about 80 percent of bedrock-based wells tapping a rock type similar to that underlying the proposed subdivision site provide 3 gallons per minute or more. Approximately 10 percent yielded ±17 gallons per minute or more. Wells should be located as far from any septic system or systems as possible and placed uphill from any septic system. The minimum separating distance is 75 feet, as established by the Public Health Code. Also, wells should be separated as far apart as possible which should help to prevent interference of one well with another during pumping.

Under proposal "B" (Planned Unit Development project), the developer intends to utilize a community well or wells to serve the needs of the development. If a design standard of 150 gallons per day per bedroom is used, a total of 12,450 gallons of water would be required for 83 bedrooms. This amount of water would require a well producing at least 12 gallons per minute. This yield was calculated on an 18 hour pumping period. Based on Water Resources Bulletin No. 30, approximately 20 percent of the wells tapping the same type of rock underlying the site, would yield about 12 gallons per minute. As a result of this relatively low percentage, it may be necessary to drill more than one well, perhaps even a series of wells to ensure adequate amounts of water to users on the water supply. Provisions should be made for storing at least one-third the peak daily demand (about 4,150 gallons and preferably a full day's water requirement in case there are problems with the project's pump system).

Since the Public Water Supply section of the State Health Department reviews and approves community water supplies, they should be contacted as soon as possible in order to discuss the following: (1) projected needs of the development in terms of water quantity, (2) location of the community well or wells on the site, (3) water quality testing requirements, and (4) plans for pumpage, storage, treatment, if necessary, and the distribution system. Consideration should be given in advance to providing for proper operation and maintenance to the community water supply system (i.e., establishment of a homeowners association).

The developer(s) should consider drilling the well or wells first, and test for water quantity and quality prior to any actual construction on the site. A six inch drilled well is visible on the southside of the farmhouse in the eastern portions of the property. It may be worthwhile to conduct a pump test of several days or weeks to determine what the yield of that well is. At the same time, samples could be collected and tested for water quality. If yields are adequate and water quality good, the well may be used by itself or in conjunction with other wells to supply the needs of the development.

The quality of groundwater should be satisfactory. However, Water Resources Bulletin No. 30 suggests that elevated iron and manganese levels may affect well water quality in the vicinity of the project site. As a result, it may be necessary to install an appropriate water treatment filtration system.

SEWAGE DISPOSAL

Since there are no municipal sewerage facilities available, the proposed subdivision would be served by on-site subsurface sewage disposal systems. It is assumed the Town does not have future plans for the construction of any major sewerage treatment facilities and therefore would rely on a sewer avoidance program for the long-term.

The engineering firm has presented a preliminary layout for two community subsurface sewage systems in order to accommodate a possible cluster arrangement of buildings. The overall density of development (number of dwelling units) would be substantially increased from a standard subdivision of one acre or larger lots for the property. As the projected sewage flows from such a project would be substantially above 5,000 gallons per day, plans would have to be reviewed and approved by the Department of Environmental Protection.

Soil mapping data of this parcel and information on soil tests previously conducted indicates generally well-drained upland soils suitable for sewage disposal purposes. However, visual observations and soil descriptions, particularly for some areas of the property, indicate that the major concerns or constraints for sewage disposal would be steepness of slope, rock outcrops and/or shallow depth to underlying bedrock. Also, a portion of the low, west side, near the river, may be limited by wetlands and/or elevated ground water.

In general, a minimum of 4 feet of soil must be maintained between the bottom of a leach field system and bedrock and at least 1.5 feet (preferably 2 feet) above the maximum ground water level. Only a very limited number of test pits have apparently been made in the designated areas for the community sewage disposal systems. While these indicate suitable conditions, the Team Sanitarian questions whether a sufficient area was investigated to represent the space (other than for general feasibility) needed to accommodate leaching systems for the estimated flow. He also has some reservation about the steepness of the slope, particularly for the north side system. While slope will enhance the removal of effluent from the area of the leaching system, one must be especially careful to prevent effluent from seeping to the surface, without having first received adequate treatment and renovation, in areas downgrade of the system.

If the intent of the project is to avoid developing on marginal land and to accomplish a more desirable environment than is posisble through strict application of minimum requirements of the existing subdivision and zoning regulations, an approach of this kind would seem desirable. The matter of acceptable density for a possible project of this type in a rural community should be fully considered and evaluated by those having responsibility for local land use planning.

In regard to a conventional subdivision layout, it has generally been recognized that where both on-site water supply and sewage disposal is to occur on individual lots, such lots should be at least a minimum of an acre. Where unfavorable conditions are present and which may seriously affect the installation and operation of sewage disposal systems, larger lots should be planned.

As some of the proposed lots have indications of relatively shallow bedrock, it should be ascertained that sufficient area, having adequate soil depth, would be available in the leach system areas. Provisions for the disposal of ground water (detected at several test pits at depths of around 4 feet) should be made, particularly from any deep footing drains. The Team Sanitarian recommends additional pits on a few of the proposed lower lots (7 and 8) for ground water purposes (lot 7 in relation to the proximity of the river at the rear).

PLANNING CONCERNS

Proposal A - Typical Subdivision

This proposal to construct 13 four and five bedroom detached single family homes would not serve the expanding need for housing of moderate size and price in this growing community. While new housing construction in Hebron has increased dramatically in recent years, housing opportunities are limited almost entirely to those who can afford to purchase a single family home on at least one acre of land. Furthermore, the Town has recently proposed to amend the zoning regulations to require at least a two acre lot for all future single family homes. The effect of this limited housing supply is that many groups, including moderate income families, single persons, one parent households, first time homebuyers, town employees and others of modest means, are prevented from obtaining housing in Hebron. Many communities are also experiencing growing numbers of "empty nesters." Empty nesters refer to one or two persons, often elderly, whose children have moved away, leaving a large home that has become too costly and difficult to maintain.

The site in question is moderately sloped, however, there are natural terraces that could accommodate scattered development. A typical subdivision approach would require substantial filling and grading, resulting in the loss of many natural amenities including a pleasing, rolling landscape, practically all of the beautiful old trees, scenic stonewalls and a significant wildlife habitat near Jeremy Brook at the western edge of the property. This proposal calls for the construction of individual septic systems for the 13 homes. As indicated by preliminary plans, this development alternative would result in the construction of individual leaching fields closer to the brook than the community sewage systems proposed under the cluster alternative.

Proposal B - Village Residential Proposal

This proposal, calling for 50 to 52 one and two bedroom units in a cluster design, addresses the current need for moderately sized housing in Hebron. The cluster development concept not only provides for increased housing choice within the Town, but also lends itself to utilizing irreplaceable natural features of the land and creating an attractive development that conforms to, rather than destroys these natural features. The cluster housing concept can be a genuine visual asset to the neighborhood and the Town.

The design concept's strongest advantage is that it allows flexibility in the positioning of structures on the land and relative to each other. This has implications for increasing the overall density, but also for increasing the total amount of open space, minimizing paved areas, providing for more flexibility in the placement of septic systems and increasing the energy efficiency of the units. The cluster concept also allows such factors as light, shadows, noise, appropriate locations for recreation and parking facilities and landscaping to be considered in the design process. The developer has said that several of the units could be adapted for handicapped individuals by designing walkout basements for handicapped access. This could be readily accomplished via cluster design and should be encouraged by the Town.

Several large old trees near the center of the site could be salvaged through careful landscape planning and construction. The trees along the perimeter of the property can and should also be preserved. Some existing stonewalls on the property could be maintained as well. Disturbance to the natural wildlife habitat near Jeremy Brook would be less severe under the cluster plan. At the same time, a nature retreat could be established in this area for residents of the development.

The two proposed locations for the community septic fields in the western portion of the site may be too close to Jeremy Brook. This is specially true for the proposed north side system; consultant field tests show that slopes of 16.5% exist in this area.

The proposed access road, according to preliminary plans and topographic maps distributed to the ERT by developer, will follow a tract of land that may be too steeply sloped without alterations to the land. Preliminary calculations indicate that slopes of 15% and more exist at several points along the proposed access road tract. Slopes of this magnitude are generally unacceptable for a neighborhood road, however, the Town of Hebron Subdivision regulations do not specify a maximum acceptable slope within the design criteria for new subdivision streets. If substantial alterations to the land are required in order to reduce the access road slope, several valuable old trees near the center of the property will probably be lost.

It should be noted that the preliminary cluster development plan shows a right of way of 40 feet for proposed access road. The existing Subdivision Regulations require a minimum right of way of 50 feet for new streets. If the access road is allowed to connect to both Routes 66 and 85, increased traffic through the development may result from vehicles "short-cutting" through the property to avoid the light at the intersection of Routes 66 and 85. A traffic signal at the intersection of the site access road and Route 85 may be necessary at some point in the future.

Finally, it should be noted that the clustering of the most intensive residential areas near the center of town, the most intensively developed commercial area, conforms to state and regional goals for the growth of predominantely rural communities like Hebron. This preferred location strategy also makes sense from a municipal services point of view.

Draft Town of Hebron Facility Plan

This draft report dated September 1982, prepared by Hayden, Harding and Buchanan Inc., is the result of a 1978 Department of Environmental Protection order to the Town of Hebron to develop a plan and implement any required programs for alleviating the widespread failure of subsurface sewage disposal systems in the Town. The report is comprehensive in scope, addressing on a town-wide basis such issues as drainage, ground and surface water quality, soil conditions, current sewage disposal methods, land use, population growth, water conservation opportunities, and cost and environmental risk considerations of various sewage disposal methods. The Town of Hebron Water Pollution Control Authority is responsible for the preparation of this study and the implementation of its recommendations.

Residential development in Hebron is located in three dispersed areas of Town: the Amston Lake area in the southeastern section, the center of Town and the extreme north end. Currently, 57.7% of the Town consists of undeveloped woodland, however, much of the developable has been developed.

Hebron's topography generally falls in the 5 to 15% slope category, but there are many areas with slopes of 20% and more. Development is generally located on flatter land, with the exception of the Amston Lake area, where houses are built on steep slopes around the lake.

Soil patterns are generally complex with regard to texture, stoniness, rockiness, drainage and depth. The Charlton-Gloucester-Hollis Association (which appears to comprise much of this site), occurs extensively throughout the Town. The Paxton-Charlton Association also occurs extensively and is characterized by a hard compact layer of till at approximately 2 feet. This compact layer can severely limit the effectiveness of subsurface septic systems. The report identifies the site location as falling in an area of "slight" soils limitations: "soils are generally favorable (for septic tank absorbtion fields and sewage lagoons) and limitations are minor and easily overcome."

Sixty-seven test pits were dug as a part of this study, many of which are located very near the site. However, test results from these pits are not included in this draft version.

Most septic system failures in the Town are the result of more than one factor. The apartment units located on Wellswood Road are built on steep hills

which have contributed to septic problems there. Poor construction, aggravated by poor soil conditions, also contributed to the septic problems on lower Wall Street.

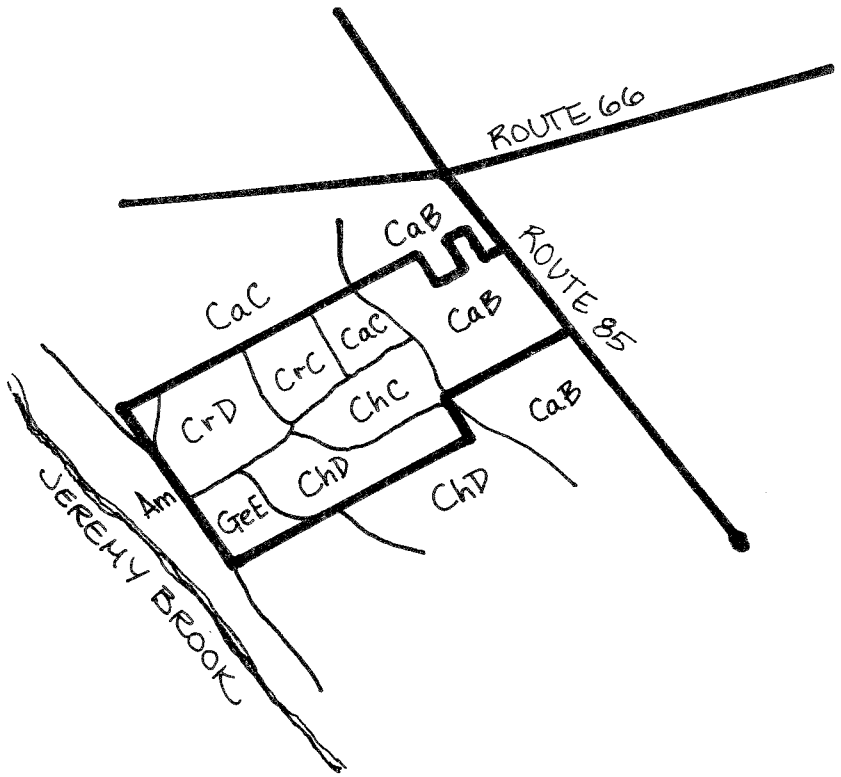
Soil conditions generally do not have a large role in failure of septic systems in Assessment Area 4. Soils vary widely but are typically of the Charlton-Glaucester-Hollis and Paxton-Charlton Associations. This is significant in that the site in question displays similar soil characteristics.

Six random private shallow wells on Main Street that were tested for water quality show signs of contamination; 5 failed to meet Department of Health requirements for potable water.

Community systems compare favorable in a ranking of sewage treatment technology alternatives. Because of land suitability and availability, water conservation measures may be an important part of the septic system design scheme.

Appendix

Soils	0 660' scale	N



STONECROFT, HEBRON, CT

SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Map Symbol and Soil Series	Septic Tank Absorption Fields	Shallow Excavations	Dwellings Without Basements	Local Roads and Streets	Lawns and Landscaping	Drainage Class
*CaB Charlton fine sandy loam 3-8% slopes	Slight	Slight	Slight	Slight	Slight	Well Drained
CaC Charlton fine sandy loam 8-15% slopes	Moderate Slope	Moderate Slope	Moderate Slope	Moderate Slope	Moderate Slope	Well Drained
ChC Charlton stony fine sandy loam 8-15% slopes	Moderate Slope	Moderate Slope	Moderate Slope	Moderate Slope	Moderate Large Stones, Slope	Well Drained
ChD Charlton stony fine sandy loam 15-25% slopes	Severe Slope	Severe Slope	Severe Slope	Severe Slope	Severe Slope	Well Drained
CrC Charlton very stony fine sandy loam 3-15% slopes	3-8% Slight 8-15% Moderate Slope	3-8% Slight 8-15% Moderate Slope	3-8% Slight 8-15% Moderate Slope	3-8% Slight 8-15% Moderate Slope	3-8% Moderate Large Stones 8-15% Moderate Large Stones Slope	Well Drained
CrD Charlton very stony fine sandy loam 15-25% slopes	Severe Slope	Severe Slope	Severe Slope	Severe Slope	Severe Slope	Well Drained
GeE Gloucester and Charlton very stony soils 15-35% slopes	Gloucester Severe, Slope, Poor Filter	Severe Slope, Cutbanks, cave	Severe Slope	Severe Slope	Severe Slope	Excessively Drained
	Charlton Severe Slope	Severe Slope	Severe Slope	Severe Slope	Severe Slope	& Well Drained

*Prime Farmlands as defined by USDA Soil Conservation Service

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 activitis. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

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

REQUESTING A REVIEW

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

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