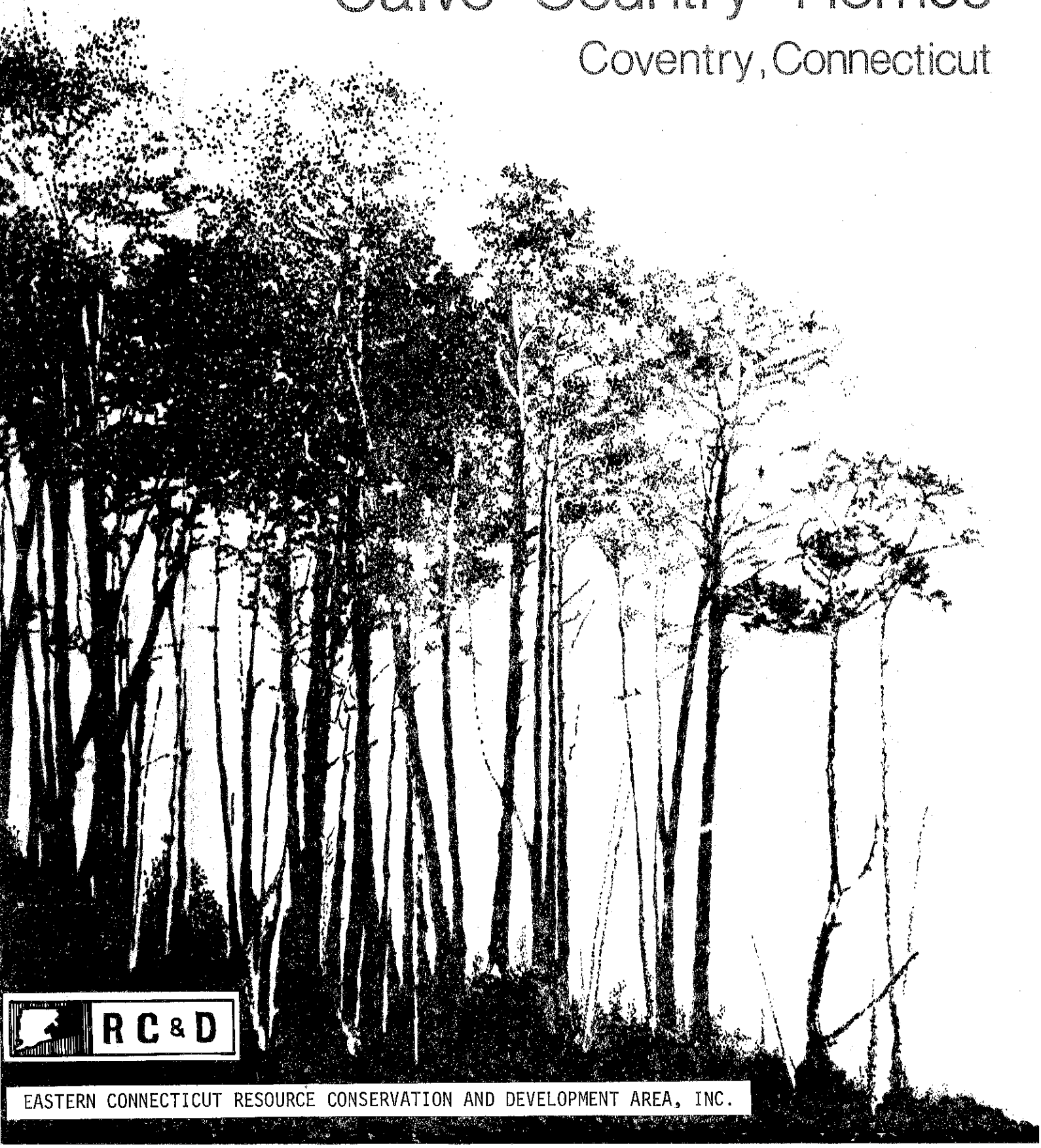
Environmental Review Team Report

Calvo Country Homes

Coventry, Connecticut



R C & D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

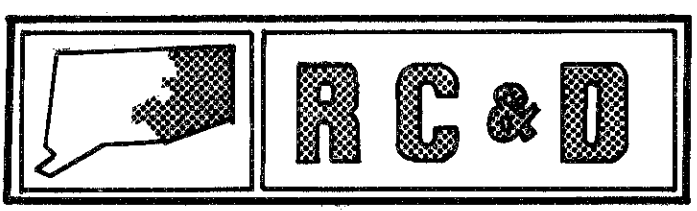
Environmental Review Team Report

on

Calvo Country Homes

Coventry, Connecticut

May 1980



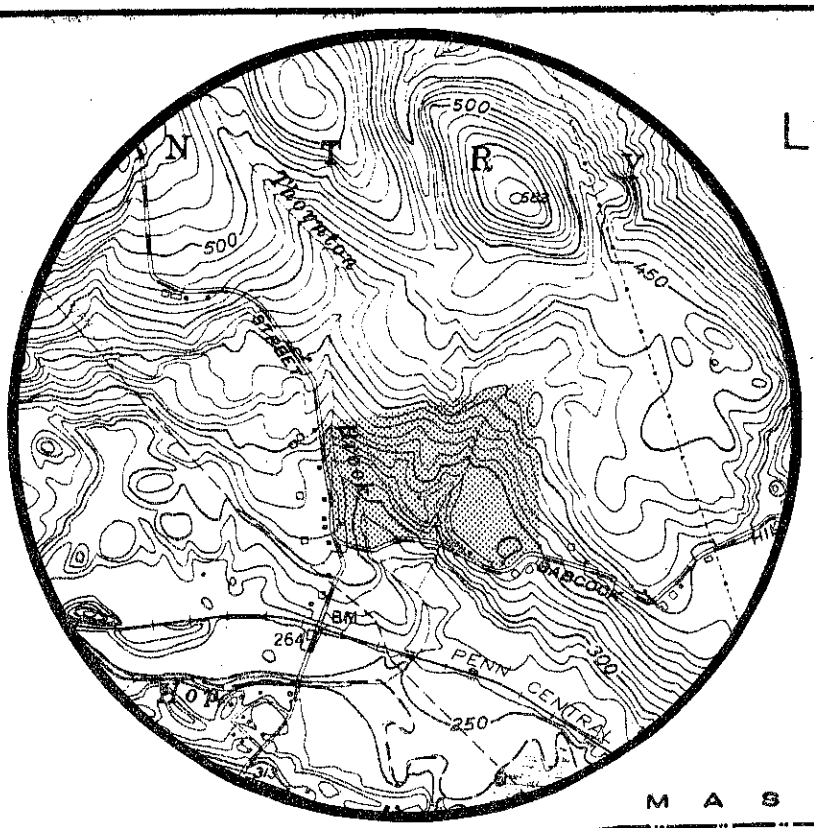
eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

Calvo Country Homes

Coventry, Connecticut



ENVIRONMENTAL REVIEW TEAM REPORT
ON
CALVO COUNTRY HOMES
COVENTRY, CONNECTICUT

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

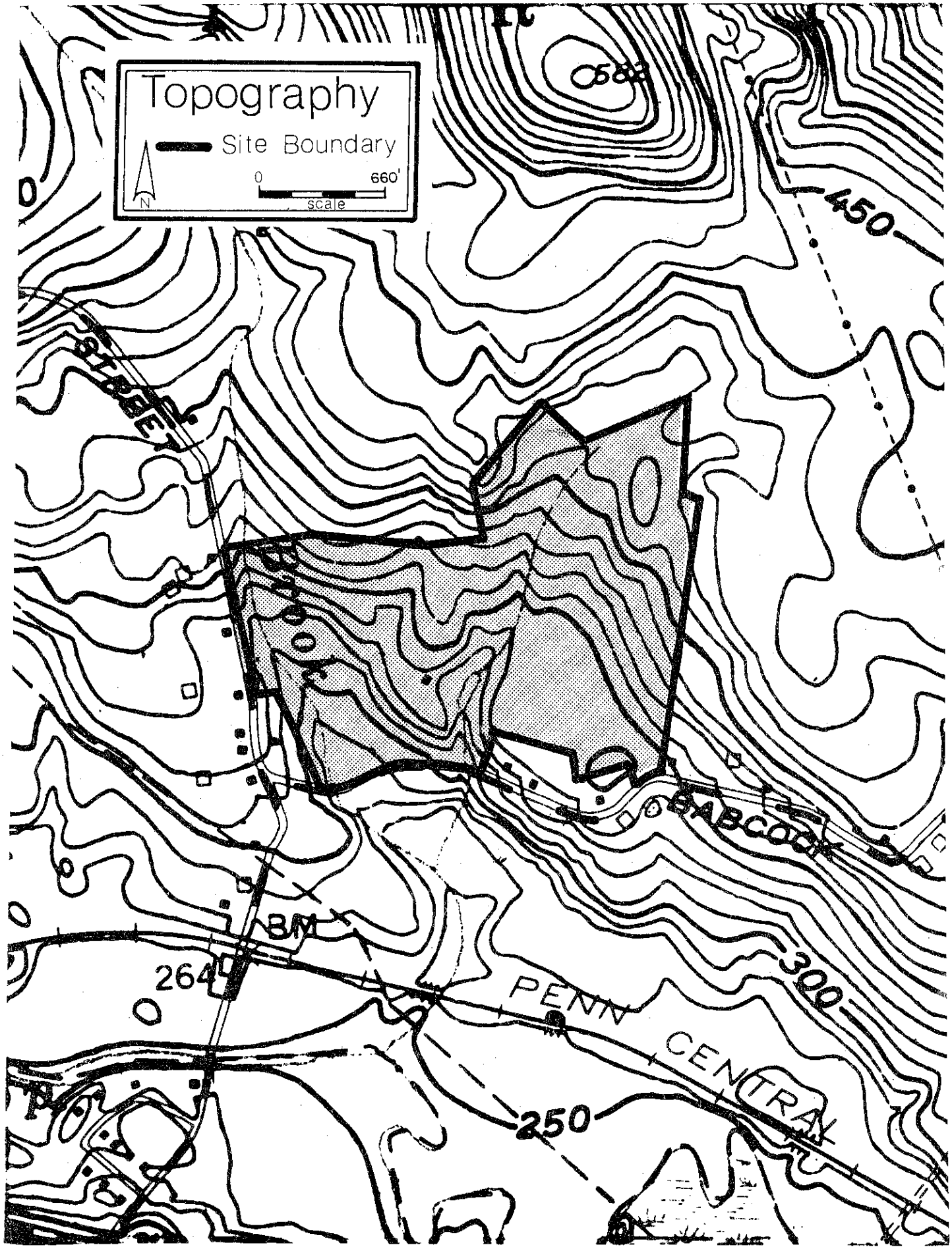
The ERT that field-checked the site consisted of the following personnel: Joseph Neafsey, District Conservationist, Soil Conservation Service (SCS); Michael Zizka, Geologist, Connecticut Department of Environmental Protection (DEP); Rob Rocks, Forester, (DEP); Don Capellaro, State Department of Health; Chuck Phillips, Fisheries Biologist, (DEP); Robert Knowlton, Engineer, (DEP); Les Barber, Regional Planner, Windham Regional Planning Agency; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Tuesday, March 25, 1980. 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 Coventry. The results of this Team action are oriented toward the development of a better environment quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Area Committee hopes that this report will be of value and assistance in making any decisions regarding 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
583
450
300
250
264
BM
STREET
ABCOCK
PENN
CENTRAL

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a 60± acre proposed subdivision. The site is located in the northeast quadrant of the intersection of Babcock Hill Road and Pucker Street. The property is currently in the private ownership of Ann Farr and Janet Paquette. Preliminary plans have been prepared by Arthur Vendola and Associates, a New Britain engineering firm.

The proposed plans show 40 lots of one or more acres in size, situated around the perimeter of the property. All lots would be served by on-site wells and on-site septic disposal systems. Access to interior lots would be provided by a new roadway which would connect Pucker Street and Babcock Hill Road. A small cul-de-sac would extend from this roadway south to the interior of the site. In some cases, streams on the property will be rerouted and piped under these proposed roads. The small pond existing on site is proposed to be used for storm water retention. A wetland area of approximately 6 acres has been reserved for open space.

The site is presently wooded, although some fuel wood cutting has taken place during the past few years. Topography of the area is generally steeply sloping. Intermittent streams and wetland areas are prevolent throughout the site. Thornton Brook flows through the western section of the site year-round and is subject to seasonal flooding.

The Team is concerned with the effect of the proposed development on the natural resource base of the site. Although severe limitations on many sites can be overcome with proper engineering techniques, these methods can be costly, making a project financially unfeasible for a developer. After field review of this proposal and subsequent research, it was evident that severe problems exist on-site with regard to wetland areas, intermittent streams, potential downstream flooding, shallow soil depth to bedrock, soils with seasonal high water table and slope. These on-site constraints will in turn cause concern for potential on-site and down stream flooding, brought on by the additional stormwater runoff created by developing homes, driveways and roadways in the area; potential problems with installation and proper functioning of subsurface sewage disposal systems and their location in proximity to wells on each lot; potential problems with flooded basements and potential problems with roadway construction.

In many cases these potential problems can be mitigated by proper engineering techniques or redesign of preliminary plans. Team opinion, as elaborated in the body of this report, suggests use of both. A preliminary plan showing reduction in the area on-site to be developed, a modified cluster approach, which would use only more easily developed areas on the site, would help to protect the resource base and the future landowner. Detailed testing and marking of soils on-site is also necessary to determine usability for septic systems. A detailed sediment and erosion control plan, as well as a stormwater management plan should be included with final subdivision plans submitted to the Planning and Zoning Commission for approval.

ENVIRONMENTAL ASSESSMENT

GEOLOGY

The site is located within the Columbia topographic quadrangle. The bedrock geology of the quadrangel has been mapped by G.L. Snyder (U.S. Geological Survey Map GQ-592, published in 1967.) The surficial geology of the quadrangle has been mapped by M.A. Zizka, and is available for inspection at the Natural Resources Center of the Department of Environmental Protection in Hartford.

Bedrock was seen in outcrop only near the center of the northern boundary of the site and in a portion of the bed of Thornton Brook, which flows southward along the western boundary of the property. Hummocky areas in the northernmost section of the site suggest shallow soils in a few locations, but in general the bedrock appears to be 7 feet or more below the surface. Most of the bedrock is schist, a well layered (foliated) rock type in which platy or flaky minerals have aligned to form surfaces of parting. Biotite, feldspar, and quartz are the major mineral components; others include garnet, sillimanite, kyanite, and graphite.

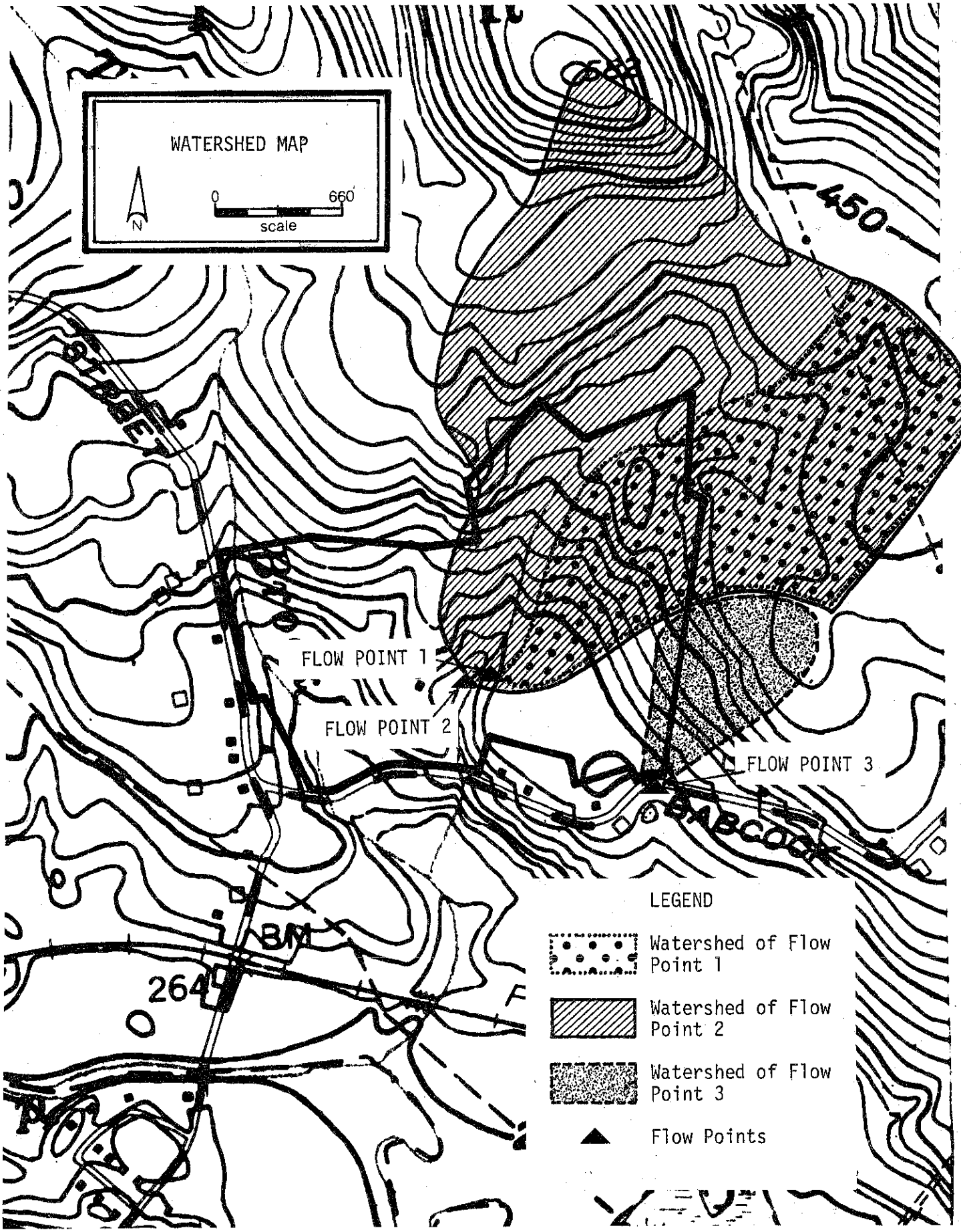
The unconsolidated material overlying the bedrock is till, a glacial sediment composed of rock particles which the glacier collected as it expanded southward into and through Connecticut. These particles include large boulders, clay, and all sizes in between. The predominant constituent is sand, which probably makes up 50 to 60 percent of the till. The texture of the till is generally loose, stony, and granular. Where the till is deep, a more compact, finer-grained till may underlie the sandier variety.

HYDROLOGY

The site contains at least one perennial stream (Thornton Brook) and several intermittent streams. Development will cause an increase in runoff from the site during periods of rainfall. This additional runoff will, in turn, lead to increased peak flows in the local streams.

It is possible to estimate the effects of development on peak flows by examining the watersheds involved, the land uses to be established, the soil types involved, and other factors. Such estimates were derived for three areas of particular interest: (1) the intermittent stream proposed for major rechanneling in the eastern half of the property; (2) the overall inflow to the on-site pond; and (3) the stream discharging from the southeastern corner of the property to a pond on the south side of Babcock Hill Road. Flows were estimated for three statistical storm events: the 2-year, 24-hour storm; the 25-year, 24-hour storm; and the 100-year, 24-hour storm. The period of years specified in each storm refers to the average frequency of occurrence; e.g. the 25-year storm occurs on an average basis of once every 25 years. These are long-term averages, however, any of the storms may occur more than once even in one year. The 24-hour designation of each storm refers to the time within which the rainfall takes place.

The accompanying watershed map shows the three flow points studied in this report and their respective watersheds. Table 1 lists the estimated peak flows for the three design storms both before and after development as planned. Prediction


WATERSHED MAP
N
0
660
scale
450
FLOW POINT 1
FLOW POINT 2
FLOW POINT 3
BABCOCK
BM
264
LEGEND
Watershed of Flow Point 1
Watershed of Flow Point 2
Watershed of Flow Point 3
Flow Points

of peak flows in small watershed areas is by no means a precise science, and estimates may vary depending upon the method of analysis used. The estimates derived for this report are probably conservative (relatively high). They are not meant to forecast exact flow rates but rather to allow a percentage comparison of pre-development and post-development flows. Two post-development peak flows are given for each storm event at Flow Points 1 and 2. One set of figures assumes no modification of present drainage paths, while the other set represents post-development conditions if the storm sewering or channel reconstruction indicated on the present site plan is carried out.

Table 1. Estimated peak flows. All flows given in cubic feet per second (cfs).

	2-year, 24-hour storm	25-year, 24-hour storm	100-year, 24-hour storm
Flow Point 1			
Present flows	17	78	134
Future flows; no channel modification	27	102	170
Percent increase from present flows	63%	30%	26%
Future flows; channel modifications made	36	133	221
Percent increase from present flows	111%	69%	64%
Flow Point 2			
Present flows	17	108	206
Future flows; no channel modification	24	130	227
Percent increase from present flows	41%	20%	10%
Future flows; channel modifications made	29	156	272
Percent increase from present flows	69%	44%	32%
Flow Point 3			
Present flows	9	39	66
Future flows	13	47	76
Percent increase from present flows	53%	22%	15%

In regard to the channel modifications that would affect flows at Flow Point 1, it should be noted that the magnitude of the effect would depend in part on the exact nature of the modifications. Piping or concrete channeling would have a greater impact than a grassed, rip-rapped, or more natural channel. The figures in Table 1 reflect the more drastic modifications.

As Table 1 shows, the peak flow increases to be expected following development are substantial. These increases further the potential for erosion upstream from the channel improvements, along existing or new channels, and downstream from the Flow Points. Upstream or on-site erosion may add an extra silt and sand load to both the pond on the site and the pond south of Babcock Hill Road near the eastern edge of the site. This potential problem would be more serious for the on-site pond since it receives drainage from approximately 120 acres of land, whereas the pond south of Babcock Hill Road is fed by runoff from only about 20 acres. A modestly-sized sediment basin near the proposed entrance to the site from Babcock Hill Road may alleviate most siltation problems for the off-site pond.

The on-site pond will be affected both by the probable influx of sediment and by the peak flows themselves. The pond had overtopped its driveway-dam just before the team's field review following a storm of less than 10-year magnitude. A decreased capacity from additional sediment and increased flow rates from heavy rainfall will stress the dam and will cause a greater frequency and somewhat higher levels of flooding. Higher flood levels may also be anticipated in the vicinity of the proposed cul-de-sac, which is already planned for an area of seasonally wet soils.

It is beyond the scope of this ERT report to recommend specific drainage measures, but it is clear that drainage is one of the most crucial considerations for a sound development on this site. The landowners should decide what future use they wish to make of their pond and should determine whether it will be feasible to maintain it in view of the potential for greatly increased inflows. Flow-reducing measures of some sort and a strict sediment-and-erosion-control plan are essential. Whether and how to make the proposed channel improvements should be carefully rethought. Legal considerations also may be involved in allowing increased runoff to flow south from the site to the neighboring property and pond.

Although the peak-flow estimates listed above in Table 1 do not include potential effects on Thornton Brook, it is certain that increased flows will also occur in that brook unless runoff retention facilities of some sort are employed. On the other hand, Thornton Brook, as it flows through the site, has a drainage area of more than 200 acres. Less than 10 percent of this area would be developed under the present plan, as opposed to about 30 percent of the watersheds shown in the watershed map. Hence, the effects of development on Thornton Brook would probably be modest.

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. 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 of the site. The soil limitations 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 Soil Surveys, 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.

Soil series typical of the site include the Charlton series, the Gloucester-Charlton series, the Paxton series, the Sutton series, the Woodbridge series and the Leicester, Ridgebury, Whitman Complex, a regulated wetland under Public Act 155. Many of these soils have slow percolation rates and are susceptible to frost action.

The Charlton series (ChB, ChC, CrC) consists of deep, well drained soils on uplands. They formed in glacial till derived mainly from schist and gneiss. Typically these soils have a dark brown very stony or extremely stony fine sandy loam surface layer 6 inches thick. The subsoil from 6 to 26 inches is yellowish brown and light olive brown fine sandy loam. The substratum from 26 to 60 inches is grayish-brown gravelly fine sandy loam. Slopes range from 0 to 45 percent.

The Gloucester series (GeC) consists of somewhat excessively drained soils on uplands. They formed in glacial till derived mainly from granite and gneiss. Typically, they have a very stony or extremely stony very dark grayish brown sandy loam surface layer 4 inches thick. The subsoil from 4 to 13 inches is dark yellowish brown gravelly sandy loam and from 13 to 27 inches is light yellowish brown gravelly loamy sand. The substratum, from 27 to 48 inches, is light yellowish brown very gravelly loamy coarse sand. Slopes range from 0 to 50 percent.

The Paxton series (PeC) consists of deep, well-drained soils that occupy drumlins or rounded hills of uplands. They formed in glacial till derived mainly from mica schist and granite. Typically these soils have a very dark grayish-brown fine sandy loam surface layer about 8 inches thick. The subsoil extending to 22 inches is yellowish-brown fine sandy loam in the upper part and light olive brown fine sandy loam in the lower part. The underlying pan layer to a depth of 41 inches is grayish-brown, platy, very firm fine sandy loam. Slopes range from 0 to 35 percent.

The Ridgebury, Leicester and Whitman (43M) mapping unit is made up of poorly and very poorly drained soils. These soils occur in an intricate and complex pattern and separation of each individual soil was not practical at the scale surveyed. Each mapping unit may contain an individual soil or a percentage of each of the three soils. More than 3% of the surface is covered with stones. In general, these soils are normally deeper than 5 feet. They have a hardpan at a depth of 18-24 inches. They are found in low-lying, nearly level upland areas. They are slowly to very slowly permeable in the subsoil, are naturally stony and contain few to many stones throughout. Most use problems are related to the slowly to very slowly permeable subsoils and long seasonal high water tables. The water table is at or near the surface from late fall through early spring.

The Sutton series (SxB) consists of deep, moderately well drained soils on uplands. They formed in glacial till. Typically these soils have a very dark

grayish brown very stony or extremely stony fine sandy loam surface layer 6 inches thick. The subsoil layers from 6 to 28 inches are dark brown and yellowish brown fine sandy loam with mottles below 12 inches. The mottles substratum from 29 to 36 inches is brown fine sandy loam and from 36 to 60 inches is light olive brown gravelly sandy loam. Slopes range from 0 to 25 percent.

The Woodbridge series (WyB, WzC) consists of deep, moderately well drained soils on uplands. They formed in glacial till. Typically these soils have a dark brown very stony or extremely stony fine sandy loam surface layer 7 inches thick. The fine sandy loam subsoil from 7 to 18 inches is dark yellowish brown in the upper part and yellowish brown in the lower part. A layer of olive sandy loam is at 18 to 21 inches. The substratum from 21 to 26 inches is olive fine sandy loam. From 26 to 42 inches is a very firm fragipan that is olive gravelly fine sandy loam. Slopes range from 0 to 35 percent.

There were areas of wetland soils within the SxB delineation on the western border of the property near Thornton Brook, in the WzC delineation near the center of the property and in the PeC delineation in the northeast corner of the property. These areas were too small to show on the 1320' scale map used for mapping. It appears from the proposed plans, that some of the lots are planned in or near these areas.

Because of the complexity of this area, it is recommended that the developer have the site mapped and flagged by a qualified soil scientist. Soil types and wetland areas can then be accurately shown on the subdivision plan map. Because of scale limitations, the 1"=660' soils map provided with this report should be used only as a guide for developing a more detailed soils map. The detailed soils map and interpretive data should provide the developer with a guide for planning the subdivision proposal.

It is suggested that deep test pit information be done on each proposed lot to reveal several problem areas; such as wetness, (high or seasonal water table) depth to bedrock, and hardpan.

Wetlands and watercourses should be left intact insofar as possible. This is important to protect the water quality of Thorton Brook and the largest of the three streams which enter the pond on the Farr property.

Some of the soils on this site have limitations due to moderately well-drained conditions and the presence of a hardpan. The developer should consider the use of subsurface drainage around home sites and septic leach fields to protect them from the seasonally high water table. Surface water control (regarding, waterways and diversions) will protect homes from surface runoff. These measures should be incorporated into the stormwater management system.

A detailed sediment and erosion control plan based on the principles outlined in the Connecticut Erosion and Sediment Control Handbook should be developed for this site. This plan should be tied into the plans for stormwater management.

Stormwater Management:

The existing pond (Farr property) has only a very small capacity for storage of stormwater. Because of slope, sites for stormwater detention will be difficult

to develop. Any proposals should take into consideration runoff conditions before and after development and measures to mitigate the effect of increased runoff downstream.

Discharge of stormwater to the pond may degrade water quality if a stormwater management and sediment and erosion control plan is not developed and implemented. The developer should consider: 1) the value of leaving wetland buffers intact along stream corridors, 2) routing stormwater around the pond, 3) using grass filter strips and/or catch basin sump to trap sediment, and 4) construction of temporary silt traps.

As maintenenace of practices is the key to effective sediment control, responsibilities for maintenance should be defined.

The proposed north-south road will discharge stormwater to the small pond across Babcock Hill Road. If flows are not controlled erosion of the existing grassed spillway could result. As water quality in this pond has already been degraded by road runoff, the need for erosion and sediment control and stormwater management is evident.

The proposed cul-de-sac and lots appear to be located in a wetland area. The developer should recognize the limitations and adverse environmental effects of construction in these type of soils.

To Summarize:

1. A detailed soil map should be developed for the area. This map and interpretive information should be the basis of planning decisions.

2. Wetland area should be identified. Development should leave wetland areas and streams intact as much as possible.

3. Development of a stormwater management system is essential to protect streams, pond and water quality.

4. A sediment and erosion control plan is essential to protect drainage system, prevent soil loss and protect water quality.

VEGETATION

This 60^{+} acre parcel proposed for subdivision may be divided into eight vegetation types, including northern hardwoods, hardwood swamp, softwoods/hardwoods, open fields and several mixed hardwood stands (see vegetation type map and vegetation type description chart). The healthy sawtimber size trees scattered over this tract have high aesthetic value and should be considered for preservation. A fuelwood thinning in one of the mixed hardwood stands would improve the health and stability of the residual trees.

The dense growth of old field juniper, which is presently wide spread in stands A and E (see vegetation type map), precludes other ground cover vegetation in these stands. Under these conditions the establishment of other more desirable

tree and shrub species is not possible. In time, as the overstory canopy closes and less sunlight is available to the juniper, it will lose its dominance, and other species will be able to become established.

The soils associated with the hardwood swamp area (stand type D) are characterized by a permanently high water table. Vegetation growth is limited to species that are able to tolerate the saturated and poorly aerated nature of these soils. Red maple are able to survive under these conditions, however, they are unstable because their root systems are shallow and their growth rates are restricted. Management of this area for timber production is not economically feasible due to the lack of desirable species, poor growth rates and the severe limitation which the high water table imposes on equipment use.

Windthrow is a potential hazard in the hardwood swamp area (stand type D) and also in the mixed hardwood stands B and C.

Tree root depth is limited in all of these stands. It is limited by the high water table in the hardwood swamp and by a compact soil layer in the other two stands. These conditions do not allow trees to become securely anchored, as a result trees are somewhat unstable. Disturbances caused by development in these areas may aggravate the situation, by allowing wind to pass through rather than over these stands. Large scale disturbances in these areas should be avoided if possible.

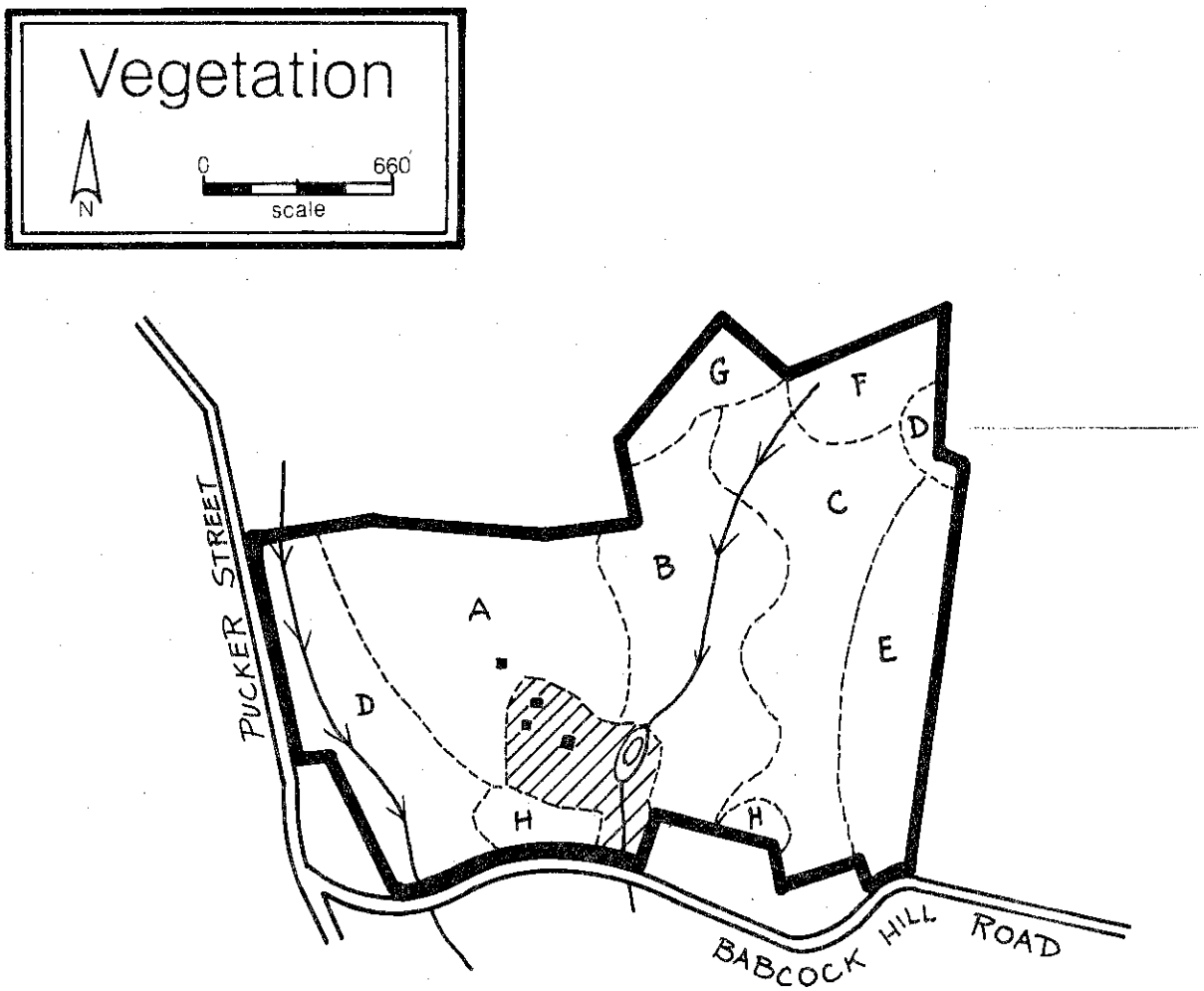
A reduction of the crowded condition in stand B by a light fuelwood thinning may, in time, reduce the windthrow hazard in this stand. This thinning will help to increase tree stability by stimulating crown and root growth in residual trees.

Ponding of water caused by blocking or restricting natural drainage flows may cause trees and shrubs in the area where the water table has risen to die. Changes in water table depth can be kept to a minimum if crossings of small streams and drainage flows are avoided whenever possible. When these crossings are unavoidable, adequately sized culverts should be utilized.

Many of the stands within this tract have occasional sawtimber size trees. These trees are well spaced and have high aesthetic value. Preservation of these trees may enhance the value of these lots by as much as twenty percent.

Trees are very sensitive to the condition of the soil within the entire area under their crowns. Development practices such as excavating, filling and grading for construction of roadways, buildings and septic systems, near trees may disturb the balance between soil aeration, soil moisture level and soil composition. 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 expensive to remove if near roadways, buildings or utility lines.

Care should be taken especially during the construction period, not to disturb the trees that are to be preserved. 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 subdivision construction.



LEGEND

- Roads
- Property Boundary
- Vegetation Type Boundary
- Stream
- Pond
- Residences
- Dirt Road
- Developed Area (4 acres)

VEGETATION TYPES

TYPE A. Mixed hardwoods. 12-acres. Understocked, pole with occasional sawtimber.

TYPE B. Mixed hardwoods/wetland. 11-acres. Overstocked sapling to pole with occasional sawtimber.

TYPE C. Mixed hardwoods. 11-acres. Fully-stocked, 2 aged sapling & sawtimber-size.

TYPE D. Hardwood swamp. 9-acres. Fully-stocked, sapling with occasional pole-size.

TYPE E. Mixed hardwoods. 7-acres. Understocked, pole-size.

TYPE F. Northern hardwoods. 3-acres. Fully-stocked, sawtimber-size.

TYPE G. Softwood/hardwood. 2-acres. Fully-stocked, pole to sawtimber-size.

TYPE H. Old field. 2-acres. Understocked, seedling to sapling-size.

VEGETATION TYPE DESCRIPTIONS

STAND TYPE	APPROX. ACRES	*MAIN STAND SIZE CLASS	STOCKING LEVEL	MAIN STAND QUALITY	MAJOR COMPONENTS OF : OVERSTORY	UNDERSTORY	GROUND COVER
A. Mixed Hardwoods	12	Pole with occasional sawtimber	understocked	medium but tree height intermediate trees with large branches somewhat open grown	Red oak, scarlet oak, red maple, shagbark hickory, pignut hickory, bigtooth aspen, occasional hemlock	Eastern red cedar graybirch, old field juniper	lacking because of dense old field juniper
B. Mixed Hardwoods in Wetland	11	pole with occasional sawtimber	overstocked	poor major of trees small tops, broken tops, poor form. Sawtimber high quality	Red maple, yellow birch and scattered sawtimber size red oak, white oak and shagbark hickory.	spicebush, highbush blueberry, bluebeech, old field juniper, occasional Mt. Laurel and witch hazel	cinnamon fern, Christmas fern, skunk cabbage, sphagnum moss, club moss
C Mixed Hardwoods	11	2 aged sapling and sawtimber	fully stocked with sapling and sawtimber	Large trees High quality High aesthetic value	Sapling size trees yellow birch, mocker-nut hickory, red oak, white oak, occasional sawtimber trees- red oak, mockernut hickory, white oak.	Hophornbeam, blue-beech, gray birch. Road clearing speckled alder.	club moss and grasses.
D. Hardwood Swamp	9	Sapling with occasional pole	fully stocked	medium to poor	red maple with occasional American elm and white ash.	Highbush blueberry, spicebush, swamp azalea, red maple seedlings, old field juniper, stemmed dogwood and occasional apple.	Cinnamon fern, sphagnum moss, club mosses, skunk cabbage, Christmas fern, tussock sedge.

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

VEGETATION TYPE DESCRIPTIONS

STAND TYPE	APPROX. ACRES	*MAIN STAND SIZE CLASS	STOCKING LEVEL	MAIN STAND QUALITY	MAJOR COMPONENTS OF : OVERSTORY	UNDERSTORY	GROUND COVER
E. Mixed Hardwoods	7	pole	understocked	medium	red maple, white oak, yellow birch, red oak	eastern red cedar, bluebeech and dense old field juniper	lacking because of old field juniper
F. Northern Hardwoods	3	sawtimber	fullystocked	medium	yellow birch, sugar maple, white ash, and red maple	hardwood tree seedlings, blue beech and witch hazel	Christmas fern, grasses and clut moss.
G. Sofwoods Hardwoods	2	pole to sawtimber	fully stocked	medium	red oak, white oak, red maple, mockernut hickory and hemlock	hemlock, hardwood tree seedlings, greenbrier	Christmas fern
H. Old Field	2	seedling sapling	understocked	medium	eastern red cedar, red maple	multiflora rose, smooth sumac, raspberry, pussy willow, speckled alder.	grasses, goldenrod, great muller, sedges, primerose

Where feasible, trees should be saved in small groups or "islands". This practice lowers the possibility of soil disturbance and machanical injury, as well as providing small habitat areas for wildlife. Individual trees and "islands" of trees should be temporarily but clearly marked so they may be avoided during construction.

Suggested Management Techniques:

The trees in vegetation stand type B, (mixed hardwoods) are declining in health and vigor as a result of their over crowded condition. This stand would benefit by receiving a light fuelwood thinning that would remove between one quarter and one third of the total volume or four to five cords per acre. This thinning should focus on the removal of poor quality trees, damaged trees, and unhealthy trees, along with trees that are directly competing with healthy high quality trees. If subdivision of this tract does occur the high quality sawtimber size trees should be left for their aesthetic and shade value. This thinning will improve the health, vigor and stability of residual trees, over time by reducing competition for space, sunlight and nutrients. If the proposed thinning is agreed upon, a consultant forester should be contacted to mark the trees to be removed.

Regardless of whether or not this thinning takes place, the trees cleared during road, house and septic system construction should be utilized for fuelwood.

WILDLIFE

Approximately 60% of the area is a mixed hardwood stand with fair to poor understory vegetation. Twenty percent of the area is open field or brush adjacent to the residences along Babcock Hill Road. The remaining 20 percent consists of small patches of conifers (hemlock or cedar). The two main streams (Thorton Brook and the main stream feeding the pond on the Farr property) provide for habitat for aquatic species.

The hardwood stand has a fair to poor understory and thus has limited value for wildlife. Some local species of birds and mammals (rabbit, squirrels, oppossum, raccoon) probably utilize the area for food, shelter, and water. In areas where a thicker understory exists, some birds's nests were noted, evidence that the area is used for breeding. Deer probably use the area to a limited extent for cover or water.

Surrounding land uses include open fields, cropland, overgrown fields, bottom land associated with the Hop River flood plain, residential land and forested areas with a wide range of values for wildlife.

Development of the area as residential land should have a minor impact on local wildlife species. This assumes that watercourses and associated wetland are left undisturbed and that sediment and erosion control plans and stormwater management plans are properly implemented and maintained.

Revegetating cleared or disturbed areas should be accomplished as soon as possible after construction. Use of a grass-legume mix on lawns, fruiting shrubs and trees, and scattered underplanting of wooded areas, as well as protection of

stream corridors, will enhance the area for wildlife forms such as song birds and small mammals.

Noise and the presence of dogs and cats will diminish the value of the area for wildlife.

FISH RESOURCES

Both streams and the small pond on the property are capable of supporting limited numbers of fish due to their small size. Stream populations would be comprised primarily of minnows (dace & shiners). The pond has been stocked with largemouth bass and probably supports minnows and perhaps some sunfish.

The pond will undergo many undesirable changes if it is used as a floodwater retention area for the proposed development. The existing silt trap above the pond will fill rapidly and silt will begin to enter the pond providing an adequate substrate for cattails and other rooted aquatic vegetation. Increased nutrient levels as a result of increased runoff from lawns and roadways will provide a suitable growth medium for filametous or unicellular algae.

The combined influences of siltation and nutrient loading will serve to fill in and reduce the aesthetic quality of the pond. In order to maintain the pond as an attractive part of the property, substantial changes must be made in the drainage design for the proposed subdivision.

WATER SUPPLY

Individual on-site water supply wells are proposed to serve homes within the subdivision. Because of the geology of the site, these wells would probably tap bedrock as a water source. Water is transmitted through bedrock and into wells along fractures. The distribution of fractures in bedrock is highly irregular; severely fractured zones may be located a few feet from relatively unfractured rock. As a consequence, it is virtually impossible to predict the yield of a new well at any given site. Nevertheless, Connecticut Water Resources Bulletin No. 11 reports that 90 percent of the bedrock-based wells within the Shetucket River Basin yield 3 gallons per minute or more, enough to supply an average family's needs. Most bedrock wells penetrate less than 200 feet of rock. Evidence from well reports suggests that the amount of fracturing in bedrock decreases significantly with depth. A well penetrating 200 feet of rock without achieving a sufficient yield probably won't be improved by further drilling.

The Tatnic Hill Formation, which is the bedrock type most prevalent on the site, contains rusty-weathering zones in some surface exposures that indicate the presence of iron or manganese-bearing minerals. Water passing through such zones in the subsurface may pick up objectionable concentrations of these elements. It is possible that some wells in the subdivision could draw mineralized water; this problem may often be solved satisfactorily by filtration or water-softening devices. In other respects, the natural groundwater quality should be good.

Each well should be located in a relatively high section of the lot. Proper location and maintaining adequate separation distance from sewage disposal systems

(minimum of 75 feet) and other potential types of pollution (fuel oil tanks, salt from road drainage or back wash water from water softener units, if installed on water systems, and water courses) can reasonably assure the safety of a water supply.

It has generally been recognized that a minimum size lot of an acre is needed where both on-site water supply and subsurface sewage disposal is to be utilized. This also implies that relatively favorable conditions (topography, soils) prevail. In this case, much of the area does not have desirable conditions.

A possible alternative would be the development of a central, public water system.

SEWAGE DISPOSAL

The town of Coventry does not have municipal sewers available, therefore, this development will be serviced by on-site subsurface sewage disposal systems.

In general, based on the terrain which has an abundance of watercourses, seasonal and/or year around, extensive wetland areas and sloping hillsides, the parcel is not regarded as being particularly suitable for sewage disposal purposes. Soil mapping data, particularly of that portion of the property which lies to the east side of the central watercourse and pond, also indicates severe limitations for that purpose. The upper soil is underlain with fragipan and is subject to a seasonal high water condition. It can be expected, due to the more impervious fragipan and slope, there would be more of a tendency for sewage to move laterally following the natural topography. It appears the most favorable portion of the site lies to the west side of the central watercourse and pond and towards the northern (upper end). Again this area would be restricted by the watercourse (Thornton Brook) and wetland which is near the west end of the property. There are also one or two other drainage courses with some extremely stony areas in this section, before coming to Thornton Brook.

There has been little or no on-site testing of the acreage. A limited number of possible sites at the east side of the property have tentative layouts for the houses, wells and sewage disposal systems. The majority of the lots in this portion of the subdivision would be subject to high ground water and have moderate to slowly permeable hardpan or fragipan below the subsoil. This type of soil(s) can create a perched ground water condition during wet periods. It is likely that any sewage leaching system would have to be designed in order to keep the bottom of the system sufficiently above the hardpan or fragipan layer. Fill material would need to be incorporated where necessary. Likewise, the size of any proposed system would need to be kept large, based on percolation tests conducted within the underlying compact soil.

ROADS/TRAFFIC

The existing streets surrounding the proposed subdivision exhibit many design deficiencies which will become more evident as development activity accelerates on adjacent land. The Babcock Hill Road frontage of this subdivision has particularly poor sightline problems, especially for any new roadway serving the eastern portion of the parcel and leading off of Bunker Hill Road, at the easternmost boundary.

Only major reconstruction of the road in this vicinity, well off the site, could significantly improve the situation.

Any access provided from Babcock Hill Road to the eastern third of the subdivision should serve only a limited number of house lots. In addition it may be undesirable to permit a through street connecting Pucker Street to Babcock Hill Road to exit along the parcel's narrow frontage on Babcock Hill Road at its eastern end. Any such through connection will likely significantly increase the vehicular movements at the location of the poorest roadway geometry on Babcock Hill Road.

It is not likely that a development of the size contemplated would tax the capacity of the adjacent roads; it would, nevertheless, increase the incidence of safety problems.

The line of site at each interior intersection seems to be adequate. The State of Connecticut sets certain design standards for estimating line of site. There must be a clear line of site, or field of vision, at every intersection, measuring in 15 feet from the edge of the major lane from a point 3.75 feet off the ground, a person must be able to see a point on the major road, in the middle of the lane, at a height of 4.5 feet. The distance to this point varies with the designated speed limit. For 20 mph design distance is 200 feet in either direction; for 30 mph the distance is 300 feet.

The maximum slope of any of the roads in the development is eight percent. This is an average slope for small subdivisions and should not cause major problems.

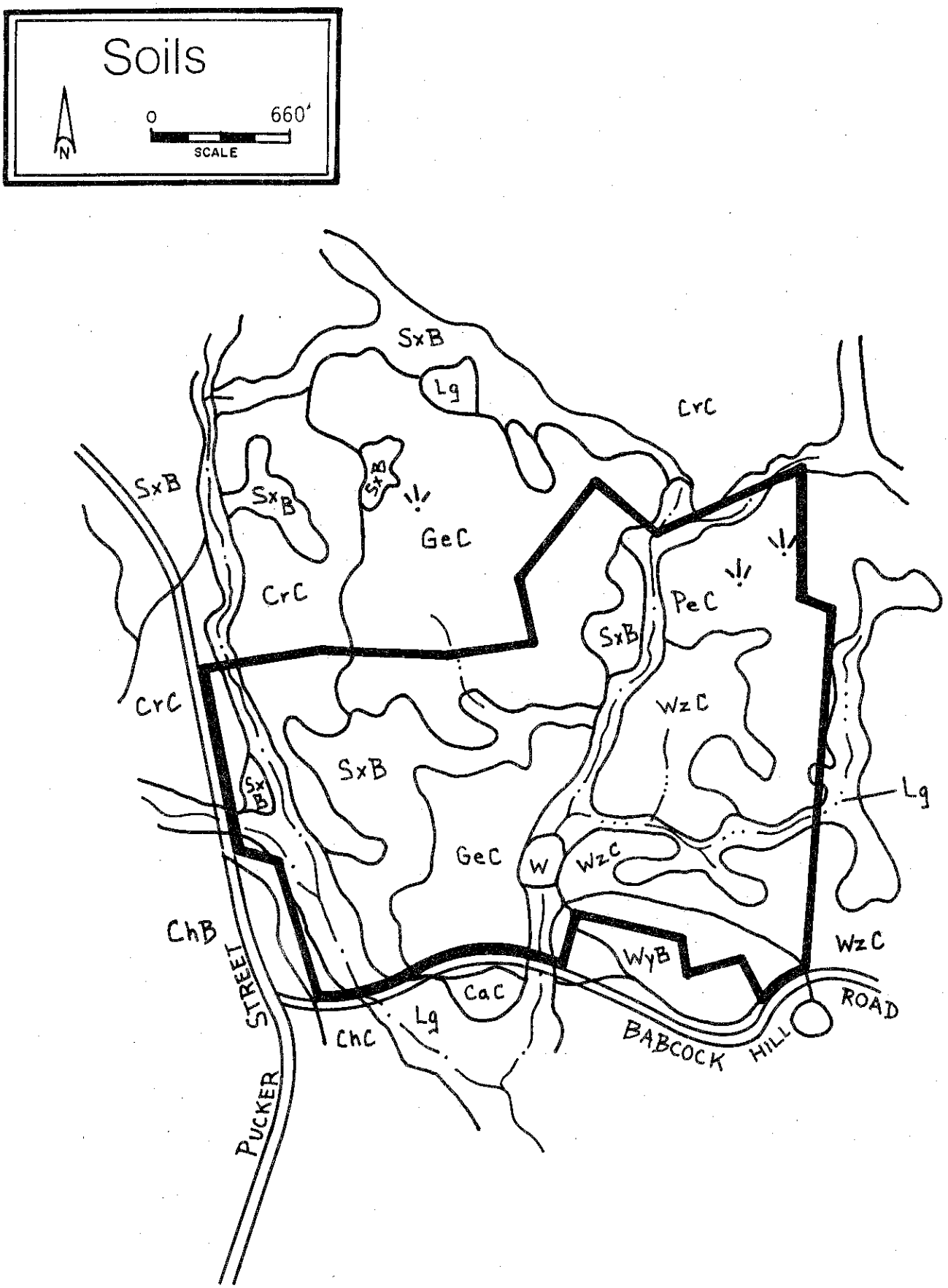
The basic structure of the road, considering the typical section shown in the plans, seems to be adequate for light duty rural roads. Frost susceptibility of soils during the winter and early spring may become a problem in pavement stability. Fine grained silts and clays are especially prone to frost heaving. Therefore, the developer may want to consider excavation of the fine grained materials and use of a subbase with more coarse sands and gravels. Another consideration is the installation of drains through wetland soils. One type of drain commonly used is a perforated pipe, running parallel to the side of the road, set below the frost line and filled around with crushed stone. This will keep the water table low enough under the roadway to slow down the formation of ice lenses, which cause frost heaving.

DESIGN/ZONING CONSIDERATIONS

The site is a pleasant one, but without spectacular natural features. The eastern portion, which has not been recently logged, contains a large upland area having sizeable birch and oak trees which would provide aesthetically pleasing settings for home sites. The easterly brook corridor is itself a pleasant feature with some associated maple and hemlock forests; it should be the focus of an open space system within the subdivision. All of these features are rather subtle and fragile. Intensive housing development requiring substantial construction and grading activity would probably obliterate most of these desirable qualities. Because of that, this particular site could benefit from the maximum flexibility in siting of lots, structures and roadways, i.e., cluster development. The better soils and less distinctive landscape to the west could accommodate more of the homes - the more easterly portion, which also contains the poorest soils, could receive fewer homes.

Cul-de-Sac spurs into the site, rather than interconnecting, through streets, would better achieve development objectives without seriously damaging the environmental qualities of the site. Clustering, with a reduction in the total number of lots intended and the creative use of rear lots, would permit a distribution of homes on the site sensitively related to the limitations of the streams and wetlands and allow the maximum exploitation of the better soils and the more attractive wooded sites.

Appendix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BABCOCK
HILL
PUCKER
STREET

CALVO COUNTRY HOMES
COVENTRY, 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	Lawns & Land-Scaping
Charlton	ChB			Large Stones	1	1	1	2
Charlton	ChC			Large Stones	2	2	2	2
Charlton	CrC			Slope,Large Stones	2	2	2	2
Gloucester-Charlton	GeC			Large Stones, Poor filter, Slope	2-3	2	2	3-2
**Leicester, Ridgebury Whitman	Lg			Percs slowly, Wetness,Frost Action, Large Stones	3	3	3	3
Paxton	PeC			Slope,Wetness	3	2	2	2
Sutton	SxB			Wetness,Slope, Frost action, Large Stones	3	3	2	2
Woodbridge	WyB			Percs slowly, Wetness, Frost action	3	3	3	2
Woodbridge	WzC			Slope,Wetness, Frost Action, Percs Slowly, Large Stones	3	3	3	2

* LIMITATIONS: 1 = slight; 2 = moderate; 3 = severe.
** Regulated wetland soil under P.A. 155.

SOIL INTERPRETATIONS FOR URBAN USES

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

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

Slight Limitations

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

Moderate Limitations

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

Severe Limitations

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

About the Team

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

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.