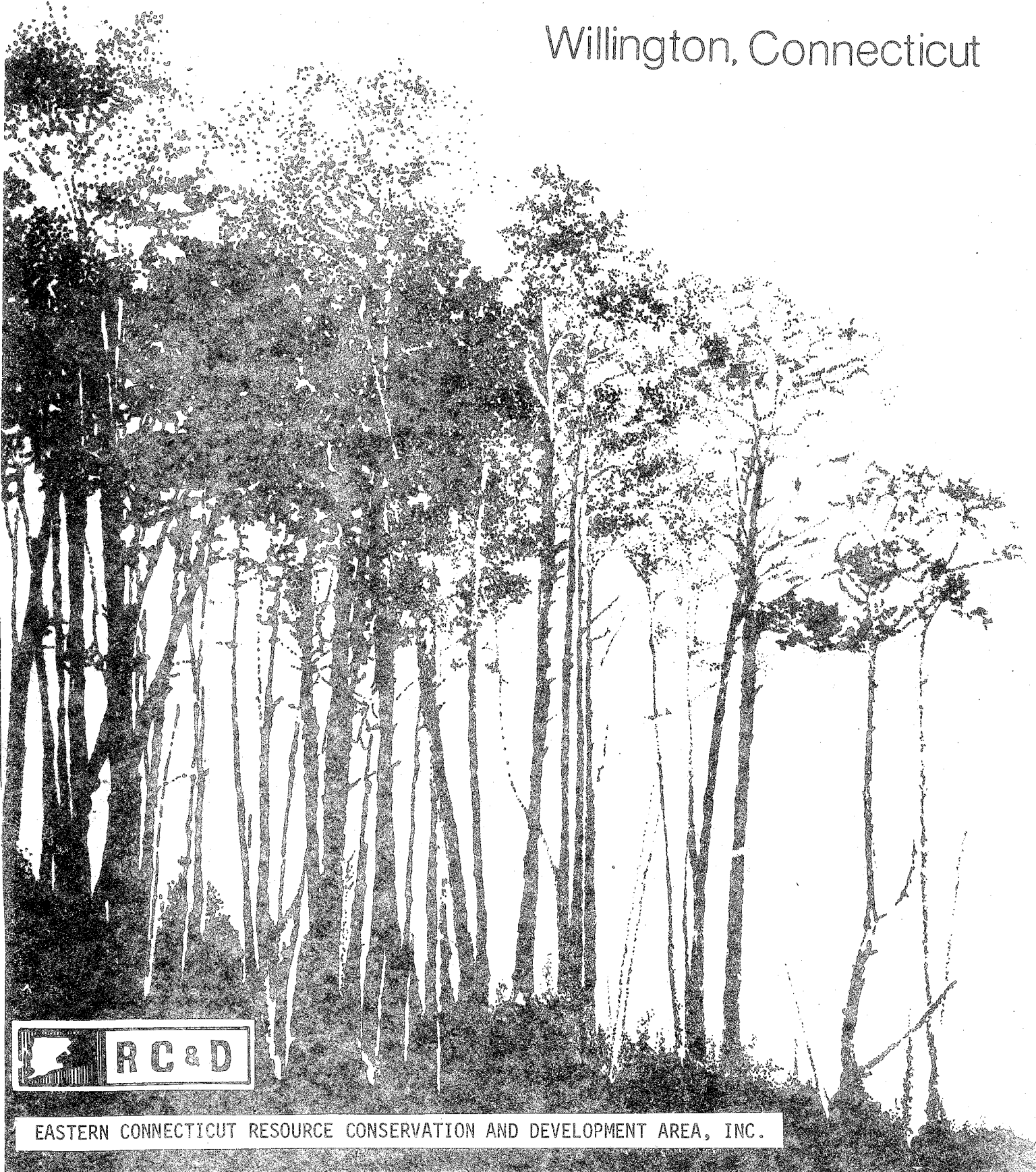


Environmental Review Team Report

Deer Run Estates

Willington, Connecticut

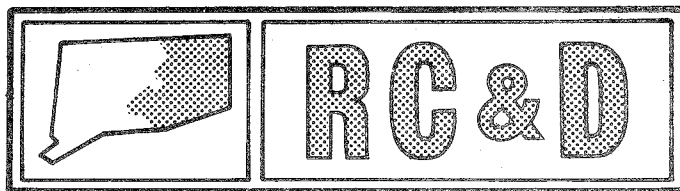


EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

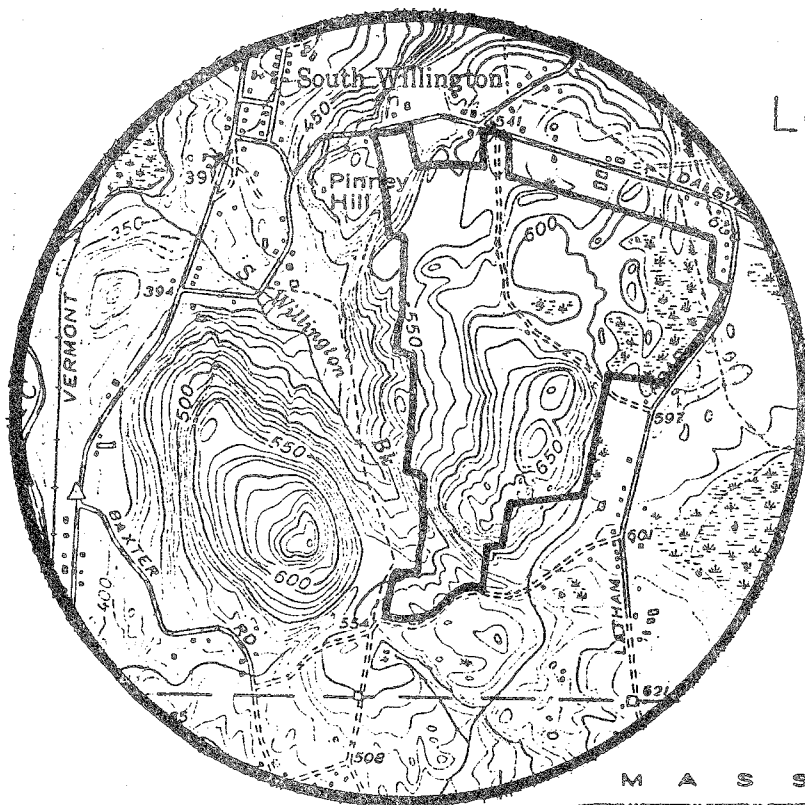
Environmental Review Team
Report

Deer Run Estates
Willington, Connecticut

February 1983



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



Location of Study Site

DEER RUN ESTATES
WILLINGTON, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
DEER RUN ESTATES
WILLINGTON, CONNECTICUT

This report is an outgrowth of a request from the Willington 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, SCS; Jim Parda, Forester, Connecticut Department of Environmental Protection (DEP); Bill Warzecha, Geologist, DEP; Don Capellaro, Sanitarian, State Department of Health; Meg Reich, Windham Regional Planning Agency; Dwight Southwick, Engineer (SCS); and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field-checked the site on Thursday, December 2, 1982. Reports from each contributing 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 Willington. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of land use.

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

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut, 06234, 774-1253.

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment of a proposed subdivision in the town of Willington. The proposed development, known as Deer Run Estates, is approximately 211 acres in size and is located on Pinney Hill Road and Latham Road in the southern section of the town. The property is owned by the Gardner Hall, Jr. Company of Narberth, Pennsylvania. Preliminary engineering plans have been prepared by Gardner & Peterson Associates, Tolland, Connecticut.

Preliminary plans propose 50 lots of approximately two or more acres. Each lot will be served by an on-site well and an on-site septic system. Ten of the fifty lots front on established town roads, all other lots front on proposed interior roads. The access to interior lots will be from Pinney Hill Road and will end in two cul-de-sacs.

The topography of the site ranges from steeply sloping to flat. Several large wetland areas, and small pockets of poorly drained soils are located in the central and eastern portions of the property. The site is forested at present, a small evergreen tree plantation exists on the northern side of the site. The property has potential for wildlife management, many species, including deer, were sighted during the field review.

The Team is concerned with the effect of this proposal on the natural resource base of the site. Although many severe limitations to development can be overcome with proper engineering techniques, these measures can become costly, making a project financially unfeasible for a developer. In the case of Deer Run Estates, the site has a number of severe limitations to development. These include steep slopes, wetland and poorly drained soils, rapidly draining soils, and shallow depth to bedrock. After careful examination of the preliminary engineering plans and field review of the site, it appears that the proposed density of the development and location of lots and roadways will minimize adverse impacts on the resource base of the site. Individual team member concerns are discussed in detail in the following sections of this report and it is advised that concerns raised should be addressed by the developer in any final plans presented to the town commissions for approval. Several general Team recommendations offered to the Town include requiring the developer to design and implement a sediment and erosion control plan for the site, and consider including a provision for cluster residential developments in the Willington zoning regulations.

ENVIRONMENTAL ASSESSMENT

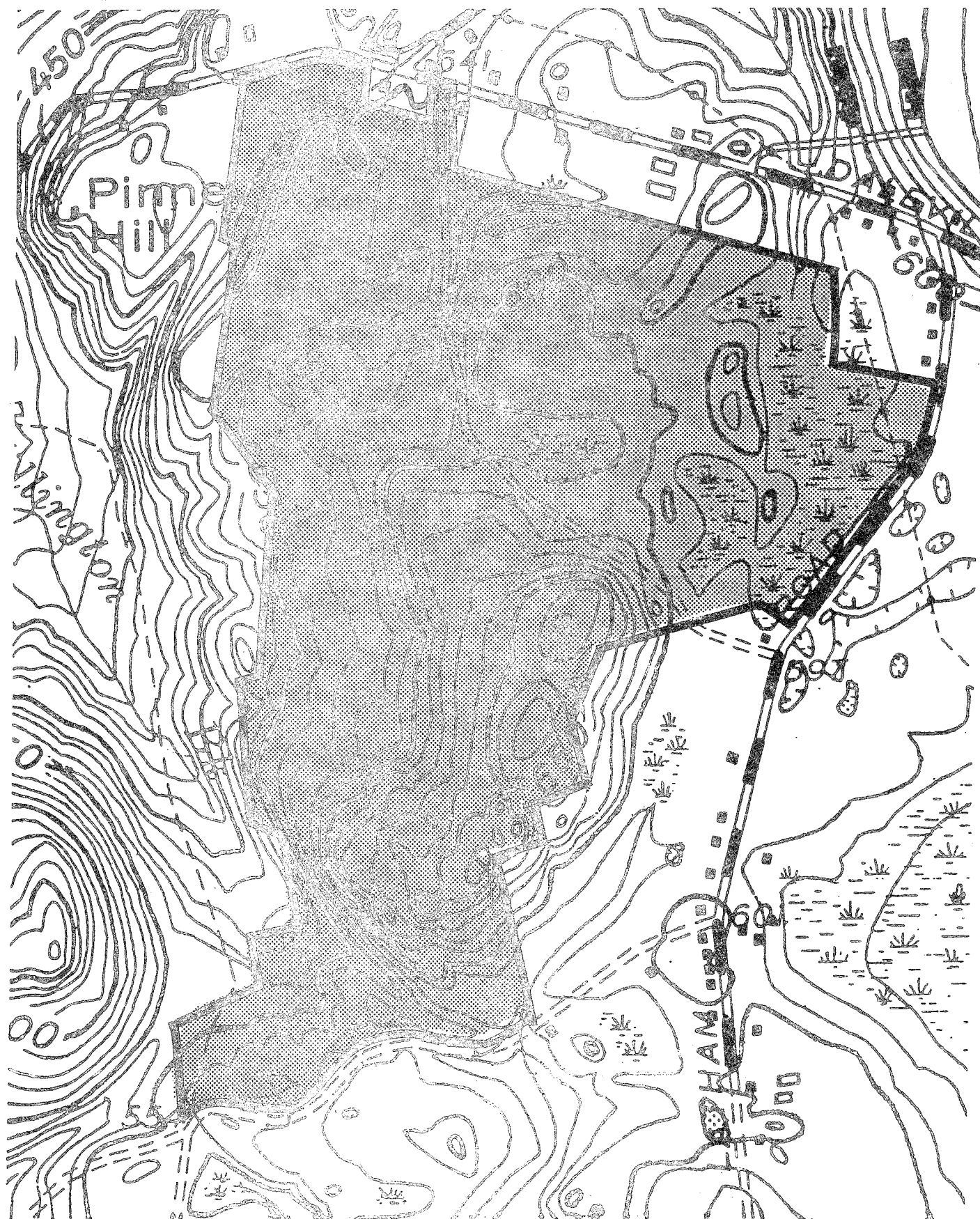
TOPOGRAPHY

The proposed 50 lot subdivision is situated east to southeast of Pinney Hill

Topography

— Site Boundary

0 660'
scale



in South Willington. The elevation varies from a low of approximately 550' above mean sea level to a high of 660' above mean sea level. There is a large wetland area comprised of \pm 30 acres in the eastern portion of the site.

The site is a combination of moderately to steeply sloped areas and relatively flat benches (see accompanying illustration). The steepest areas can be found throughout the southern half of the property, particularly along Burt Latham Road (see accompanying illustration). Also, there is a steeply sloping area beginning about 300' from the intersection of the proposed access road with Pinney Hill Road. The remaining portion of the property has moderate to gently sloping areas with the (predominantly) flatter areas in the middle section of the parcel.

GEOLOGY

The Deer Run Estates site lies within the South Coventry topographic quadrangle area. At the present time, there are no published bedrock or surficial geology maps of this area. However, there are open-file maps of the bedrock and surficial geology which are available for examination at the Natural Resources Center (DEP) in Hartford.

The rock units underlying the unconsolidated material on the site are classified as: the Hamilton Reservoir Formation in the western portion of the site; the Hamilton Reservoir Formation (Sulfidic Schist) in the eastern portion of the site; and a strip of the Bigelow Brook Formation which runs parallel to Burt Latham Road in the southern section of the site (see Bedrock Geology map).

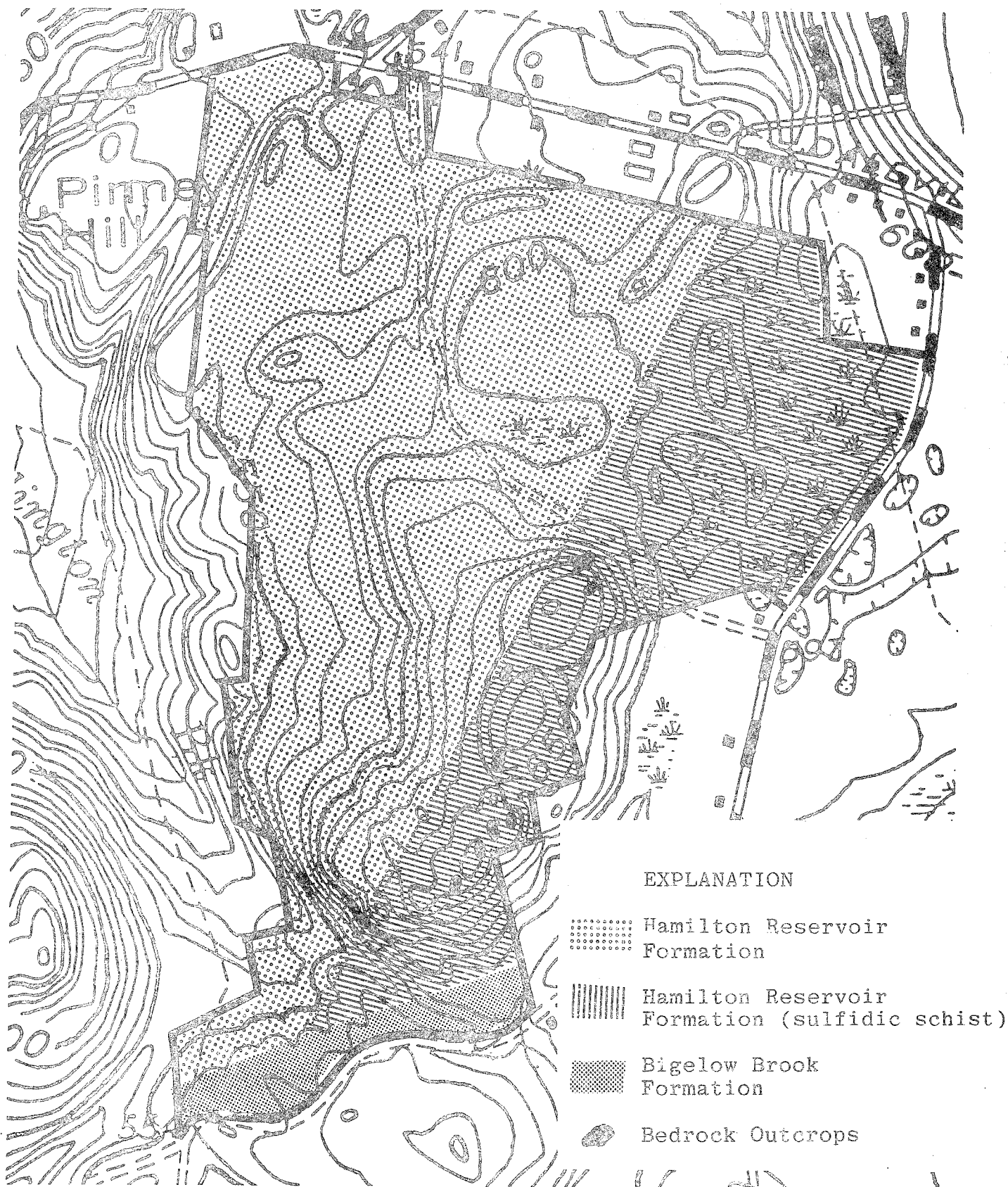
The Hamilton Reservoir Formation of the Lower Gneiss Member consists largely of a thinly layered, fine-grained, light-brownish-gray to olive-brown, brown biotite schist interlayered with medium-grained, light to dark-gray, quartz-oligoclase-biotite gneiss. Since the gneiss is more resistant than the biotite schist, the outcrops have a ribbed weathered surface. Principal minerals of this gneiss are quartz, oligoclase and biotite. Gneisses are banded or streaked crystalline rocks formed by regional metamorphism. Regional metamorphism involves excessive heat and pressure affecting extensive areas.

The Hamilton Reservoir Formation (Sulfidic Schist) consists of a lens of rusty-brown weathered, medium-grained, quartz-feldspar-biotite, garnet, graphite sulfide schist. Schists are crystalline rocks on which flaky minerals have aligned to form structural layers along which parting commonly occurs. Schists are usually finer grained than gneisses and are also produced under regional metamorphism.

The Bigelow Brook Formation is composed of a gray weathered, fine to medium-grained quartz-feldspar-biotite-garnet-sillimanite gneiss and schist. It differs from the Hamilton Reservoir Formation in that rusty weathering, sulfide schist and gneiss are less conspicuous and calc-silicate-bearing gneiss lenses are more common.

Bedrock Geology

0 660
scale



For additional information regarding the bedrock geology refer to the open-file map of the bedrock geology of the South Coventry quadrangle, by R.J. Fahey and M.H. Pease, Jr. (1977).

The unconsolidated material on the site overlying the bedrock consists primarily of stratified sand and gravel deposits in the northern section of the parcel and till in the southern section of the parcel. The stratified sand and gravel deposits which consist of layers of silt, sand and gravel were deposited by glacial meltwater streams during the last stages of glaciation (see surficial geology map). Till consists of very poorly sorted, unstratified deposits of rock particles and fragments composed of sand, silt, gravel and boulders with a varying degree of compaction.

Based on deep test hole information supplied by the consulting engineer, the stratified sand and gravel deposits were found primarily on Lots 1 - 7, 12-15, 23-27, 30-33, and 37-46. Till deposits were found on Lots 8-11, 16-22, 28, 29, 34-36, and 47-50. Some of these lots revealed some sand and gravel deposits mixed with the relatively compacted till material. These results were consistent with the soil map included in the Appendix to this report.

Depth of the unconsolidated material on the site ranges from $\pm 10'$ primarily where sand and gravel deposits exist to less than 10' where till deposits and shallow to bedrock conditions exist.

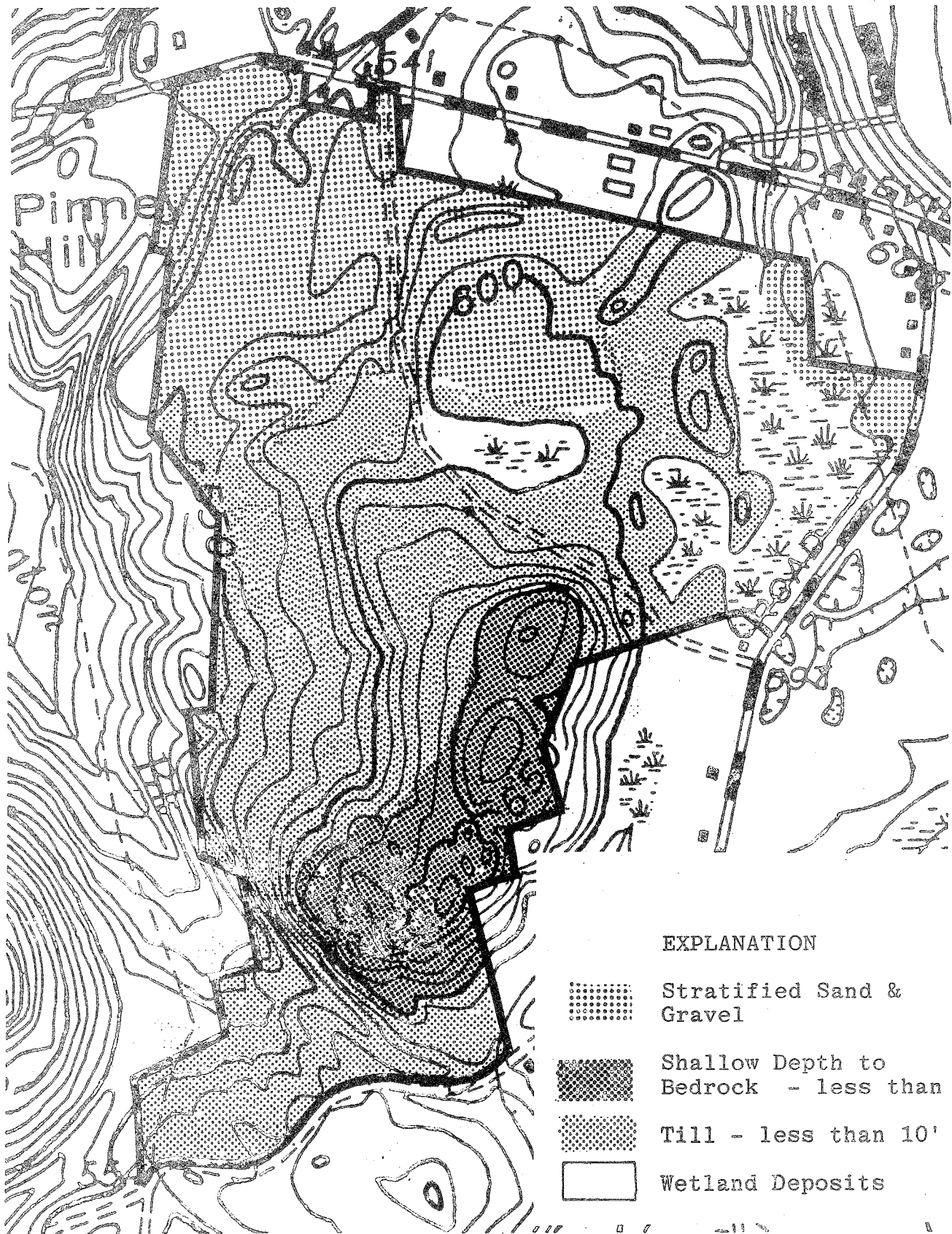
HYDROLOGY

The watershed for the Deer Run Estates site is divided approximately in half in a north-south direction (see accompanying illustration). Runoff from the eastern portion (Part A) of the property flows northward through a large wetland area, from which it is channelled northwest via a small, unnamed stream where it discharges into Hall's Pond. The western portion of the property drains westward into the South Willington Brook which empties into the Willimantic River. The major drainage basin divide is located to the east of the property.

Development of the site will cause an increase in the volume of runoff, however, the consulting engineer indicates that stormwater runoff will be retained within the site. These increases would be caused by such factors as removal of vegetative matter, compaction of soils in disturbed areas and the creation of impervious surfaces such as roofs, paved driveways and roads. For the most part, runoff will be carried either naturally or artificially into wetland areas on the site. Plans indicate that energy dissipators to reduce the velocity of runoff will be installed on Lots 12 and 14. All other points of discharge will have flared ends with 4" riprap. Permanent drainage easements should be considered on lots 7, 8, 10, 12 and 14. The drainage outlet at lot 14 does not involve a great volume of water, however it is on a 21% slope. The developer should consider moving this outlet 150 feet to an area of more gentle slope.

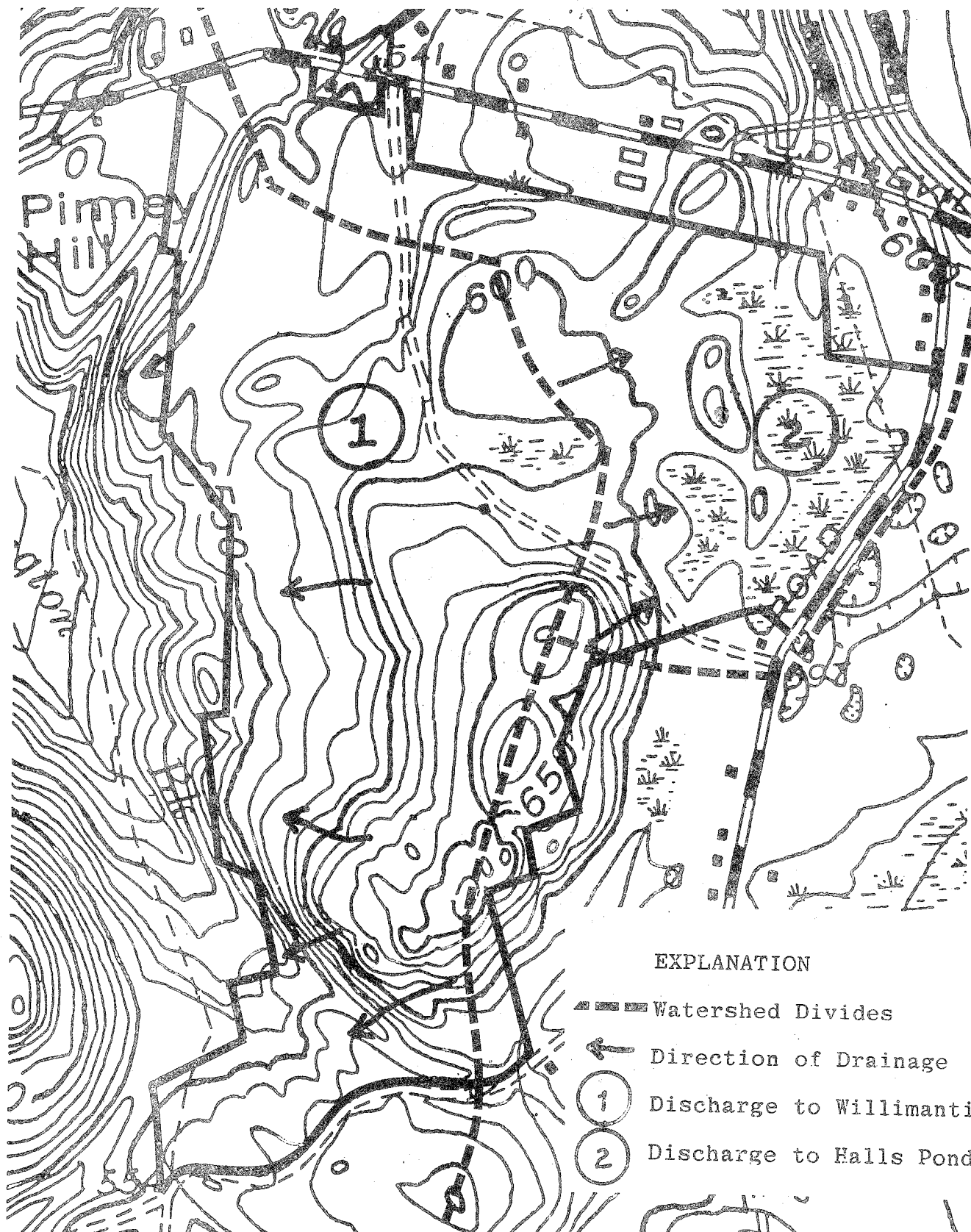
Surficial Geology

0 660
Scale



Drainage Areas

0 660'
Scale



EXPLANATION

--- Watershed Divides

← Direction of Drainage

① Discharge to Willimantic R.

② Discharge to Halls Pond

Special attention should be directed to the amount of runoff discharged into the wetland areas, its overall affect on the wetland areas, and maintenance measures to be taken, should a significant buildup of sediment occur at the discharge points.

SOILS

A detailed soils map of this site is included in the Appendix to this report accompanied by a detailed soils descriptions and 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 limitation chart indicates the probable limitations for each of the soils for on-site sewage disposal, buildings with basement, streets and parking, landscaping, camp sites, picnic areas, playgrounds and trails and paths. 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, within the publication Soil Survey: Tolland County, Connecticut, can aid in the identification and interpretations 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 District Conservationist who accompanied the Team has reviewed the published soil survey information and it appears to correlate well with the test hole information prepared by Gardner and Peterson, Inc. The area is complex and there are several inclusions of poorly drained soils (wetlands) associated with watercourses on the site as well as inclusions of moderately drained soils within the area mapped as well drained. These areas are small in size (1-3 acres) and are not shown on the published map due to scale limitations.

Wetlands on the site were mapped and flagged by Mr. Lewis Ilgen, private soil scientist. The boundaries and wetland locations were also checked by Mr. Steve Tessitore of the DEP Inland Wetlands Program in conjunction with the DEP review of Gardner Hall, Jr. Co. wetlands permit application. The District Conservationist reviewed the location and boundaries and agrees that the wetlands as shown on the site plan are substantially correct.

Soil information indicates that limitations due to slope, erosion hazards and wetness are slight to moderate and can be overcome with proper planning and construction techniques. Limitations for septic tank absorption fields are listed as severe for several soils on the site; however, these can be overcome by proper planning, design and installation and by the use of recommended separation distances to wells or watercourses. The site is suitable for this type of proposal. However,

the work will need to be carefully planned and carried out with all safeguards in place to protect the local environment. Denser building clusters (attached or detached) would allow the best soils to be used for waste disposal, minimize road construction and preserve a large percentage of the land in a natural state.

The area proposed for development is currently forested and in good hydrologic condition. During the development of this area, approximately 50 acres will be disturbed to varying degrees. The infiltrative capacity of soils on the site is high, the slopes moderate and subwatersheds relatively small. These factors will allow relatively easy control of erosion and sedimentation.

It is recommended that the developer be required to prepare and implement a specific sediment and erosion control plan for the construction phase of this project. Surface water control, subsurface water control, protection of cut and fill slopes, wetland crossing stabilization, protection of stormwater systems, and establishment of permanent vegetative cover should be addressed. The procedures and standards found in the Connecticut Erosion and Sediment Control Handbook should be used to develop this plan.

AGRICULTURAL LAND

The State of Connecticut's Conservation and Development Policies Plan 1982-85 shows part of the land in this proposed subdivision to be an area recommended for conservation.

The land along Pinney Hill Road is an area of prime agricultural soils. The land in this subdivision, currently planted in Christmas trees, along with land in adjacent properties makes up an area of active agricultural land and prime soils of 25 or more acres.

The state's "action strategy" for such areas is to:

Plan and manage for the long term public benefit the lands contributing to the state's need for food, fiber, water and other resources, open space, recreation and environmental quality, and insure that changes in use are compatible with the identified conservation values.

The prime agricultural soils in Deer Run Estates could be preserved for agricultural production by designating this area as open space. This could be most easily accomplished through cluster subdivision or development but could also be accomplished through existing open space dedication requirements (sec. 3.5). The area of prime agricultural soils could be designated as part of the common open space for the development and could thus be conserved, yet could still be utilized for community gardens for residents of the development or rented for active agricultural production (including being left in Christmas tree production.

Even utilizing this area for recreation space (ball fields, play lots) would conserve the production capacity of the land more than would its development as house lots.

FOREST RESOURCES

The tract which is proposed for subdivision can be divided into five vegetative types (see map). These include a natural white pine stand which totals 32 acres; a mixed hardwood stand which totals 120 acres; two hardwood swamps totaling 30 acres; two softwood-hardwood stands totaling 23 acres; and open areas with fields, Christmas trees and an open house lot of 6 acres.

Vegetation Types 1, 2, and 4 have all been harvested within the last 10 years. As a result of the harvest, Vegetation Type 1 is a healthy and aesthetically pleasing pure white pine stand, Vegetation Type 2 a poorly stocked mixed hardwood stand with several culls and undesirable trees, and Vegetation Type 4 is healthy and still somewhat crowded with too many trees per acre. In Vegetation Type 1, if more than one-fifth of the trees are removed in linear clearings or large open patches are created for houses the risk of wind throw and breakage from ice and snow will be increased greatly. The high risk culls in Vegetation Type 2 should be removed for safety purposes. Impact on Vegetation Type 3 as a result of roads or building should be minimal, as long as present drainage is not disturbed, however these wetland areas provide water and shelter for wildlife on the property. Disturbance of the vegetative diversity on this property would negatively impact the large deer population and affect birds, small mammals and fur beavers, although not severely.

Vegetation Type Descriptions

Type 1 - (Softwoods) This 32 acre area is a fully stocked stand composed of white pine in a healthy condition, properly spaced and growing well. The understory is dense white pine regeneration 5-8 feet tall. Due to dense shade on the forest floor little else grows there at this time. Occasional openings receiving sunlight have hardwood (oak-birch) regeneration present, mixed with the pine.

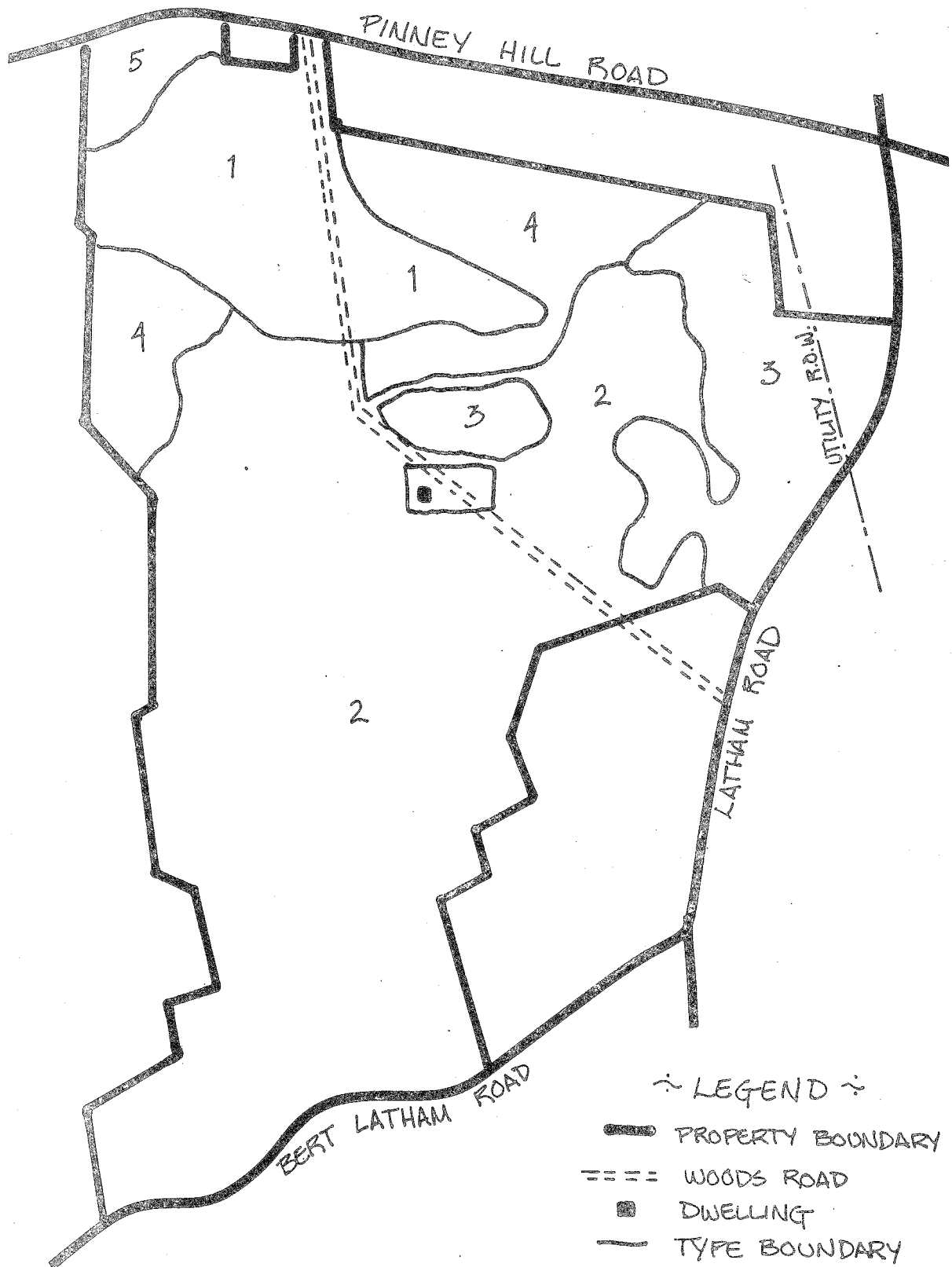
Type 2 - (Mixed Hardwoods) This 120 acre stand is composed of black oak, scarlet oak, white oak, red maple, hickory, white ash and scrub oak. The understory is hardwood regeneration, blueberry, huckleberry, and blackberry. There is also scattered mountain laurel between the two portions of Vegetation Type 3.

Type 3 - (Hardwood Swamp) This 30 acre section is composed of red maple, white ash and white pine on the edges. Spicebush, highbush blueberry, viburnum, sweet pepperbush, sphagnum moss, and fern dominate the understory.

Type 4 - (Softwood-Hardwood) This 23 acre area is composed of white pine, hemlock, black oak, scarlet oak, white oak and red maple. Understory vegetation consists of white pine and hardwood regeneration, witch hazel, blueberry, scrub oak and some fern and chub moss.

Vegetation

0 660
scale



Type 5 - (Open Field) This 6 acre field is composed of grasses with occasional hardwoods, Christmas trees on about 3 acres, and some brushy areas near the house lot and open yard.

Aesthetic Considerations

It should be noted that development practices such as excavation, filling, and grading for construction of roadways and buildings near trees may disturb the balance between soil aeration, soil moisture and soil composition. These disturbances can cause a decline in tree health and vigor resulting in tree mortality within three to five years. Mechanical injury from machinery can have the same results. The white pine in Vegetation Type 1 are subject to blow down and limb breakage from ice, wind, and snow if large openings (one quarter acre or more) or linear clearings are created so as to remove more than one-fifth of the trees per acre. Dead or broken trees reduce the aesthetic quality of an area and may become hazardous and expensive to remove if near roadways, buildings, or utility lines. Several trees in Vegetation Type 2 are presently cull or undesirable. Few trees are tall, straight and well-formed. Approximately one-third of the present trees would be suitable to be retained as aesthetically pleasing specimens (straight, well-formed) around houses and along streets. Care should be taken during any construction not to disturb the trees that are to be retained. Healthy and high vigor trees should be favored for protection because they are usually more resistant to the environmental stresses brought about by construction (root cutting, mechanical injury).

Where possible trees should be retained in small groups. This practice lowers the possibility of soil disturbance and mechanical injury. These areas should be clearly marked before any construction would begin. This would also improve the wildlife habitat in a housing development situation.

Limiting Conditions/Potential Hazards

Alterations in wetland areas which permanently raise or lower the water table will eventually have a negative impact on the vegetation in these areas. Raising the water table will drown roots causing widespread mortality in the trees, shrubs and herbaceous vegetation now present. Lowering of the water table will cause mortality from drought. Lowering of the water table will also deprive local wildlife of sources of water. Death of trees in general as a result of water table disturbance would result in reduced nesting areas, lack of cavity trees for homes, and reduced shelter and hiding areas. Proper construction methods near wetlands will create minimal impact on the wetlands.

Windthrow and tree breakage is a potential hazard in Type 1. White pine is subject to windthrow for 2-3 years after tree removal from harvesting due to shallow root systems and the tree height. White pine growing closely in a stand depend on each other for support. Type 1 is now properly stocked and growing well. Roots systems are firm in the soil. Opening for buildings or roads would create soil disturbance and open this stand up to greater windthrow and breakage potential.

Once an area does blow down or begin to break apart the opening tends to get larger as more trees break or fall. Winter winds, combined with ice/snow storms, which increase the weight of branches, increase the liability and incidence of breakage. For safety and aesthetic considerations, this stand should not be disturbed.

In Type 2 many poorly formed cull trees are present. These could present a hazard due to split seams, hollow butts, and broken branches. Only the tall, straight, well-formed trees should be retained as they are most windfirm and less likely to break apart or lose branches.

Management Considerations

In Type 2, the mixed hardwood stand is presently poorly stocked and unhealthy. The forest is presently unproductive. To stimulate productivity, a thinning to remove culls and poorly formed specimens can be performed. This type of harvest, a Shelterwood Regeneration harvest, would create openings in the forest canopy, by removing the cull and undesirable trees, to stimulate seedling production. The harvest would result in stump sprouts creating food browse for deer and seed drop in future years resulting in acorns and other seed for deer, squirrel and some birds. Presently there is little food for deer as they have browsed over the area for the past few years. Material to be removed would be 5-6 cords of fuelwood per acre.

In Type 3, the wetlands should not be disturbed as these areas are too wet to allow harvesting.

In Type 4, the softwood-hardwood type, is somewhat crowded with too many trees per acre. This area can be converted to almost pure white pine over the next 20-30 years. Pine would be a more suitable species to grow on the well-drained soils. To continue the conversion to white pine and encourage the pole-size white pine in this type the poorest hardwoods (cull and undesirable growing stock) can be removed in an improvement thinning. This type could presently yield 5 cords of fuelwood per acre.

In Type 5, the open area around the house can be left undisturbed. The Christmas tree plantation contains many well-formed, saleable Colorado Blue Spruce. This area could be maintained as a growing plantation with mowing, hardwood brush control and minimal shaping of the trees.

The proposed management plan should take place before any development of the site. This would allow uniform quality of the thinning operation and uniform removal of hazards. The thinnings in Types 2 and 4 would be less effective for the forest resource and of little consequence for wildlife after development. All trees removed during any clearing operation can be utilized for fuelwood as many of the larger trees should be retained.

A public Service Forester, is available in Tolland County for forest management advice. However, a Private Forester would be needed to implement the management recommendations.

WILDLIFE CONSIDERATIONS

This 211 acre tract presently has good potential for wildlife management. The variety of vegetation types (pure pine stands, mixed pine-hardwood stands, harvested mixed hardwood stand, wetlands and open grassy areas) provide excellent wildlife habitat. There were signs of squirrel, woodchuck, raccoon, and three white tailed deer were observed, as well as woodland birds. The potential exists for fox, rabbit, opossum, hawk, mice, and waterlife. Building on this area would limit habitat for deer, fox, hawk and limit it for some cavity nesting species.

Management of the forest resource to improve each vegetation type would however create food sources and maintain breeding and nesting areas. In Type 1, the white pine is growing well and should not be harvested at this time. The dense understory of pine provides hiding places and winter protection from wind and snow for birds as well as deer and smaller mammals.

WATER SUPPLY

Potable water supply for the proposed development is to be derived by private on-site wells. In general, deeper, drilled wells would be recommended for lending a greater degree of protection to the water source, stable reliability of yield during extremely dry periods and allowing more flexibility in placement. Based on information in the Connecticut Resources Bulletin No. 11, 90% of the bedrock wells surveyed in the Shetucket River basin yielded at least 3 gallons per minute. This amount would be considered adequate for an average home. In reviewing well completion reports (1966-1980) of bedrock wells in the area of the proposed subdivision, yield varied from 2 to 15 gallons per minute with the greatest number of wells at \pm 5 gallons per minute. Depths of the wells ranged between 125' and 225'. Although a specific amount of yield cannot be predicted, it would seem based on these well completion reports, lot owners would be likely to find a suitable well site.

Well siting should take into consideration the natural terrain with the actual well being located on a relatively high part of an individual lot, and in a direction which would be away from the normally expected direction of groundwater movement and potential sources of pollution. Where on-site sewage disposal systems will also be utilized proper separating distance between a well and waste system(s) must be maintained in accordance with Public Health Code provisions. In cases where underlying bedrock is relatively shallow or soils are extremely porous, affecting the filtration and renovation ability of soils, separating distances greater than the minimum may be necessary in order to minimize the potential hazards associated with such formations. The present Public Health Code regulations relative to subsurface sewage disposal systems includes a provision for doubling the well separation distance where the soil is tested and found to have a percolation rate faster than 1 inch per minute. In addition, this distance may be further increased if with the very porous soil, bedrock is also a limiting factor being less than 10 feet below the bottom of a leaching system.

It has been noted the proposed residential lots would be large (2 acres or larger) therefore, it seems that the overall density would be within the acceptable range for both on-site wells and waste water systems even though some lots may involve more site difficulties than others.

During the field review it was also pointed out that one or two shallow water supplies located on the northern side of Pinney Hill Road, in the vicinity of the northwest corner of the proposed development, serve the South Willington Community Water Supply. Some concern was expressed that the proposed development could have an adverse affect on the quality of this water supply. The matter was reviewed by the Water Supplies Section of the State Health Department (see Appendix) who generally concluded there should be little or no effect on the water due to the subdivision. It is noted that perhaps there would be a total of 4 of the proposed lots which would be located within the secondary recharge area, some 400 feet away from the well site. Sewage discharges from single family dwellings would most likely not exceed 350 gallons/day. This figure, applied to an acre of land, has been recommended as an acceptable loading rate for aquifer protection. In addition it is noted that roadway storm drainage within the above area (4-5 lots) would be directed towards the west side of the property where it would follow the existing drainage pattern.

WASTE DISPOSAL

Sewage disposal for the proposed lots is to be by means of individual on-site subsurface sewage systems. Based on visual observation, consideration of soil service mapping information and deep test hole data by the engineering firm, the property in general should be capable of supporting subsurface sewage disposal systems.

However, it does appear that a considerable number of the lots, although having sandy and/or gravelly soils, are probably subject to seasonal high groundwater conditions. Also a number of lots, generally towards the eastern side, have some portion of their acreage in wetlands. Several of the lots at the south side of the property (Burt Latham Road) also have indications of shallow underlying bedrock.

Public Health Code regulations require the bottom area of any leaching system to be at least 18 inches above the maximum groundwater level (also to recognize and design for perched water conditions) and 4 feet above bedrock. Because of indications of such environmental constraints for many of the lots, engineered design plans would be recommended for those sites so affected. These include lots 8, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 34, 35, 37, 39, 40, 47, 48, 49, and 50. In general, the available data supports the installation of shallow type leaching systems in areas where groundwater is to be protected and is relatively shallow and where bedrock and/or very permeable soils are present. Also where sloping terrain is involved, special care should be taken to assure diversion of any surface drainage to prevent the possible entrance of water and flooding of the sewage seepage system.

Every proposed lot is at least 80,000 square feet, as required by zoning (minimum lot size 80,000 square feet).

Most of the lots are much larger than minimum required size. A number of lots are 110+ thousand square feet, some are 130+ thousand square feet, a few are in excess of 200 thousand square feet. Lots 18 and 31 are 634 thousand and 480 thousand square feet, respectively.

Because of these large lot sizes every lot should be capable of supporting a well, septic system and house. However, a large minimum lot size does not always ensure that a lot is capable of adequately supporting development. Soils and slopes determine whether structures and septic systems can be accommodated on a lot. A five acre lot totally made up of wetlands is hardly more suitable for building than a one acre lot made up of wetlands.

A required minimum lot size as well as a required "minimum contiguous area of buildable land" for each lot can address this issue. Some towns have adopted such provisions in their zoning regulations. "Buildable area" can be defined to include only those soils determined to be other than wetland soils or shallow to bedrock. Steep slopes (greater than 15 percent) could also be eliminated for purposes of use for septic system leach fields or reserve areas. A publication prepared for the town of Willington, Natural Factors Affecting the Use of Land* recommends a 2 acre minimum lot size per residential unit and adds "This should be interpreted as 2 acres of buildable land per dwelling unit." (see page 28)

The Willington Plan of Development (June 1980) recommends 3 to 4 acre lots in wetland and steep slope areas. (page 8)

All of the lots in this subdivision meet, and most far exceed, the minimum required lot size. Despite wetlands and steep slopes on some lots, virtually all of the proposed lots contain sufficient "buildable" land area to support a single family house, well, septic system, leach field, and reserve area. However, before subdivision approval, proposed lots should be carefully scrutinized to ensure adequate area has been allocated for such improvements on each lot.

Section 3.3.1(c)5. of Willington's Subdivision Regulations regarding subsurface sewage disposal systems states:

No part of any leaching system shall be located within twenty-five feet of a slope greater than fifteen percent which extends below the elevation of the inlet invert to the leaching system.

Lots 4, 12-15 and 41 should be carefully evaluated in regard to this requirement. If necessary, septic systems should be located elsewhere on the lot, in order to avoid leach fields in steep slope areas. If not possible, regrading to accommodate leach fields may be necessary. Rearrangement of proposed lot lines could also be considered to properly accommodate leach fields.

Solid Waste from the proposed subdivision will most likely be disposed of at the Willington town landfill located off Hancock Road. This landfill is one of

*Prepared by Lawrence H. Johnson, Connecticut Department of Community Affairs, July 1974.

the last permitted by the DEP, and its expected useful life is anticipated to be a number of years into the future.

This 50 lot subdivision, as any new residential development, will effectively shorten the life of the landfill. Each person can be expected to generate approximately 7/10 ton of solid waste each year. The size of the houses ultimately built in this subdivision will influence family size, and thus amount of waste generated per lot or per house.

In 1980, Willington's population was 4,694, with 1,676 households and 1,117 families. There were 2.77 persons per household, on the average, and 3.27 persons per family.

If the first phase of Deer Run Estates were fully developed and populated by the "average" family, then those 50 families (163.5 persons) would generate 114.45 tons of solid waste each year.

Willington's 1980 population generated 3,286 tons of solid waste per year. Thus, Deer Run Estates, when fully developed, would increase the town's solid waste by approximately 3.5 percent.

ROADS/TRAFFIC CONCERNS

Access to the subdivision is proposed via a new road--Hall Hill Road-- leading into the subdivision from Pinney Hill Road, about 400+ feet west of where Navratil Road intersects Pinney Hill at a steep angle. Subdivision standards (sec. 3.2.6) require a 200 foot stopping sight distance (vertical alignment) for a design speed of 30 mph. Proposed Hall Hill Road should adequately meet this requirement.

Sec. 3.2.9.1 requires 200 feet between street intersections. The intersection of Hall Hill Road with Pinney Hill Road is separated by more than 400 feet from Navratil Road's intersection with Pinney Hill. However, Hall Hill Road and Navratil Road each sit on opposite sides of the curve in the road. This curve in combination with subsequent development on lot 46 could impair sight distance for traffic entering Pinney Hill Road from Navratil or Hall Hill Roads.

Options for preventing potential accidents due to this situation include:

- . take measurements and sitings to determine actual sight distance.
- . restrict development on lot 46 which would impair sight distance.
- . realign proposed Hall Hill Road such that it intersects Pinney Hill Road further west of the proposed alignment in order to increase distance of Hall Hill Road from the curve at lot 46 and Navratil Road, thus increasing sight distance.
- . eliminate or lessen the curve in Pinney Hill Road through road reconstruction.
- . realign the intersection of Navratil Road with Pinney Hill to more closely approach a 90 degree angle of intersection.

Access to the subdivision will be from Pinney Hill Road. There are a number of approaches to Pinney Hill Road. They include approaches from the following:

- . Navratil Road
- . Cisar or Luchon Road
- . Route 320 (Storrs Road)
- . Eldredge Road
- . Latham Road and Burt Latham Road
- . South Street or Battey Road

Some of these approaches are in need of various improvements to improve their function and ensure their ability to carry increased amounts of traffic safely.

The Regional Transportation Plan for the Windham Region (1976 and 1981 update) cites the need for road improvements on some of the approach roads to Pinney Hill Road, and thus, Deer Run Estates. The intersection of Route 320 and Eldredge Road was cited as a dangerous intersection (8 accidents 1969-73) in need of improvements. It was recommended that rock outcrops which restricted motorist visibility be removed. The intersection of Route 320 and Cisar Road is also a dangerous intersection (8 accidents 1969-73) where knolls should be eliminated to improve sight distances.

Although not specifically addressed in the Regional Transportation Plan, other approaches to Pinney Hill are not particularly efficient. The angle of intersection of Navratil Road with Pinney Hill Road is steep. It would be improved if it could be realigned to intersect Pinney Hill at an angle closer to 90 degrees and could be moved further from the curve on Pinney Hill.

South Street, which runs from Route 32 (River Road) in the village of South Willington, to Pinney Hill Road, also intersects at a steep angle. While it is aesthetically a beautiful rural road intersection, it is not the most efficient design for motor vehicle safety.

A number of roads in the southwestern section of Willington are currently in need of various improvements to provide for safe and efficient traffic circulation. Deer Run Estates or other developments in the area will increase traffic using these and other town and state roads. Thus, the need to make these improvements will become more urgent as traffic using these roads increases.

Deer Run's 50 lots can be expected to house at least 50 families in this first phase of development. The average family size in Willington of 3.27 persons per family means that 163.5 people will reside there. In 1980 there were 2,301 passenger cars registered in Willington or .49 cars per person. Thus, it can be anticipated that about 80 passenger cars will be added to the town with the subdivision.

The average single family home generates 10.6 trips per day*, thus about 530 auto trips per day will be added to the roads surrounding the development.

Traffic counts are not available for town roads, but counts on state roads in the vicinity of the proposed development are as follows:

*Trip Generation of Various Land Uses, Conn DOT, 1974.

Actual 1980 Average Daily Traffic (ADT) Counts Logged in 1980
(Northbound direction only)

	<u>ADT</u>
<u>Route 32</u>	
From Mansfield Town Line to U. S. 44/Route 32 Jct.	3500
<u>Route 320</u>	
Mansfield Town Line	3200
North of Cisar Road	1550
North of Edlredge Road	1650
South of Route 44	1150

The isolation of the proposed development from service facilities will precipitate maximum auto usage, since pedestrian and mass transit options are unavailable.

In general, the capacity of roads surrounding Deer Run Estates would not be taxed by this proposed 50 lot development. Traffic volume will increase. Which existing town roads bear the burden of most of the traffic increase will depend a great deal upon the occupations and habits of the residents of the subdivision and in what directions they need to travel to get to work or to go shopping, etc.

If many residents are affiliated with the University, Route 320 can be expected to see more of the traffic increase than other approach roads.

The proposed roads within the subdivision are Hall Hill Road and Timber Lane. They are currently proposed to be cul-de-sacs. However, the subdivision regulations (sec. 3.2.17) allow only ten building lots on a cul-de-sac. The proposed subdivision plan exceeds the 10 lot limit.

Cul-de-sac lengths are limited in part for safety reasons -- so that if a road becomes blocked in one area another entrance or egress exists for fire, ambulance, or other emergency access.

Some options for future street extension include:

- 1) Timber Lane could be extended through to Burt Latham Road,
- 2) Hall Hill Road could be extended through to Latham Road,
- 3) Timber Lane and Hall Hill Road could be joined to form a loop road,
- 4) Extend Timber Lane to Burt Latham as well as joining Timber Lane and Hall Hill Road.

In choosing among these and other options some points need to be considered:

- . Sec. 3.2.16 of the subdivision regulations states ... "Proposed local streets shall be planned to discourage through traffic."...

Thus if any roads are extended through to other existing roads care should be taken to design the extension to discourage through traffic.

Discouragement of through traffic can be accomplished through design (turns) and sign controls (stop signs) which would reduce traffic speed and thus discourage such roads from becoming a "short cut" for drivers to use in getting from one part of town to another.

- . Extension of Hall Hill Road through to Latham Road would require crossing an extensive wetland area.

There is no need for a road to cross the wetlands, and such a road should be avoided.

Any plans to join Timber Lane and Hall Hill Road to form a loop should also avoid crossing the extensive wetland area adjacent to Latham Road. Proposed lots could require rearrangement to accommodate such a road alignment.

School bus accommodations (waiting area and stopping land) may be required, according to section 3.2.11 of the subdivision regulations. School authorities and the operators of the school bus service should be contacted for their advice regarding need for and recommended locations for such a facility.

OPEN SPACE/RECREATION POTENTIAL

Willington's subdivision regulations require open spaces for parks and playgrounds be provided at the rate of one acre per ten dwelling units. This subdivision proposes 50 lots for 50 dwelling units, thus 5 acres of open space are required for the first phase. If remaining property is to be developed additional open space could be required. All the open space for the entire development should be designated and encumbered in this first phase.

The town's Plan of Development recommends a town open space facility is needed in this area (see map on page 30 and text on page 59). The town's open space facility plans and open space required of this subdivider should be jointly planned for. Park or playground space to serve the subdivision needs to be appropriately sited on land which is suitable for active recreation use. Topography and wetlands will be of concern in choosing such a site in this development.

While wetlands need be preserved, and provide excellent passive recreation space, they are not appropriate for neighborhood parks unless some active recreation space is also available. Neighborhood parks need space for play or ball-fields.

SERVICES TO SUPPORT DEVELOPMENT

Willington has services typical of a rural town with a population of 4,694. Police protection is provided by State Troopers and Town Constables.

Fire protection is provided by two volunteer fire companies located at Route 32 and Depot Road and another at Old Farms Road and Y Road. Both of these fire-

houses are in relatively close proximity to Deer Run Estates. Water with which to fight fire is provided by ponds, streams and fire ponds or tanker trucks. Need for a fire pond in this development should be determined with the advice of the fire companies which will be responding to a fire.

Library facilities are located in Hall Memorial School in South Willington in close proximity to the proposed subdivision.

Willington has two schools, the Willington Center School on Old Farms Road, grades K-3, and Hall Memorial School in South Willington, grades 4-8. High school students are bused to adjacent towns.

A three to four bedroom single family home might be expected to produce an average of 1.4 school children.* Thus a fifty home development might be expected to add approximately 70 school aged children to the town's population. The actual number of children will depend on a number of factors including number of bedrooms in the houses constructed, as well as income, occupation, and social characteristics of each family.

If age breakdowns follow past trends, then about 30 percent of the students might be expected to be of the ages which attend Center School or 21 students, 44 percent or 31 students Hall School, and 26 percent or 18 students area high schools. Willington's Plan of Development (page 32) states that if sixty students a year (spread over all grades) were added to the school population, this would not over-tax present school capacities.

Thus, Deer Run Estates will not tax the town's services by itself. Especially if the 50 lots are not developed at once, but rather phased out over a few years. However, a number of similar developments allowed to develop over a short period of time, could put a strain on present services.

COMPATIBILITY WITH SURROUNDING LAND USE

The site is located in an area of generally low density, scattered development with a few areas of moderate density development nearby including the village of South Willington, Walden Apartments on Pinney Hill Road (110 units) and Woodhaven Apartments on Cisar Road (131 units).

The large lots planned for this subdivision and subsequent homes developed can be compatible with existing development in the area. While maintaining the low density character of the area, this development will be the major first development intruding into that area rather than development along existing road frontage, thus an appropriate road layout must be chosen which will facilitate safe and efficient traffic flow in the area.

ALTERNATIVE LAND USE

This property would be well suited for a cluster subdivision. Smaller

*New Jersey County and Municipal Government Study Commission, Housing & Suburbs, Fiscal & Social Impact of Multifamily Development.

clustered lots could be grouped together on land suitable for building, while steep slopes, wetlands and prime agricultural soils could be incorporated into the common open space. The prime agricultural soils could be utilized as community gardens for the cluster residents or rented out for active agricultural use. It could also be used for recreation rather than developed as building lots. The roads could also be more easily incorporated into the existing topography. Cluster development could permit better and more ecologically sensitive use of this site. However, Willington's land use regulations do not currently provide for cluster subdivisions.

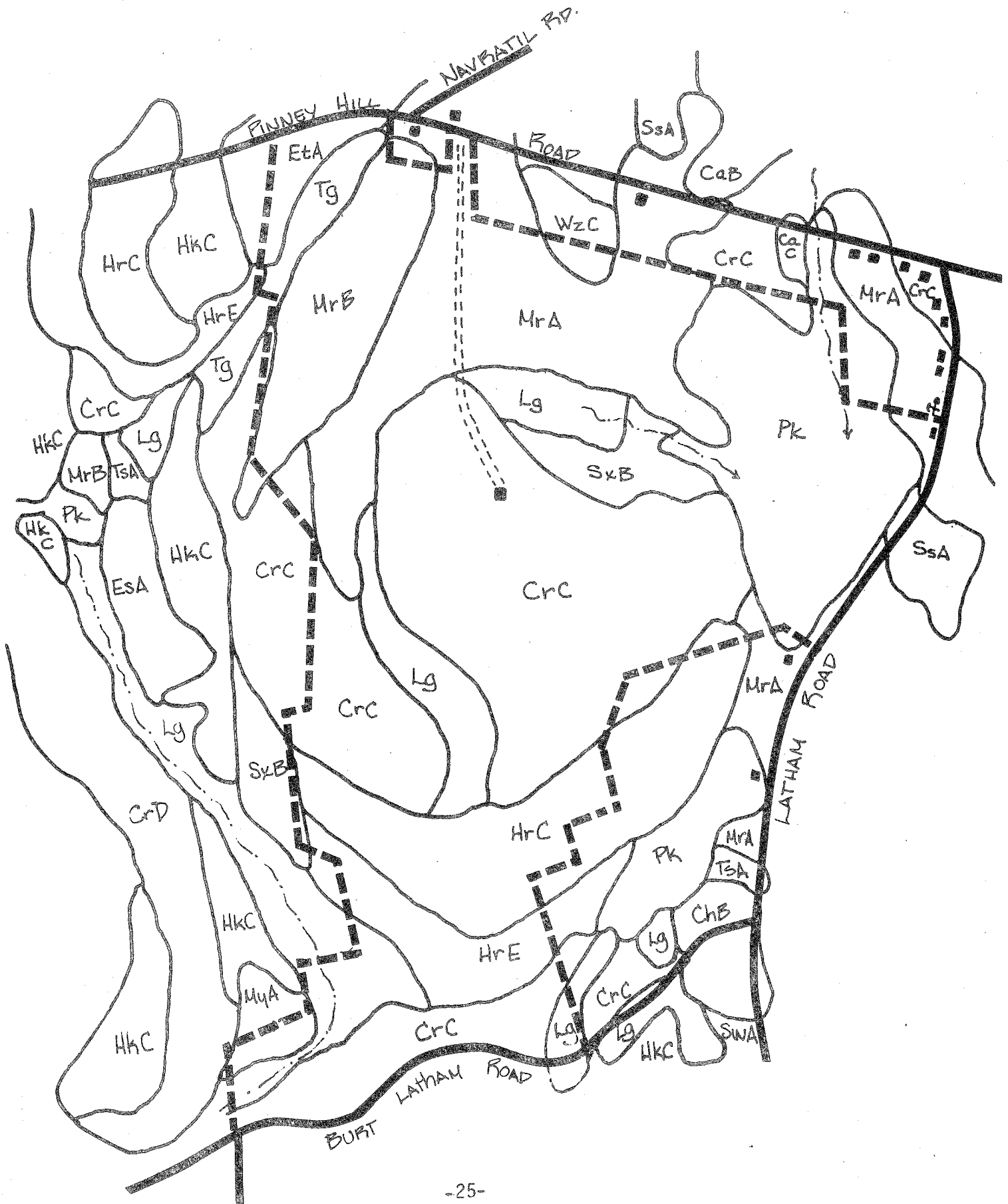
The wetland area is not suitable for development. It should be left in its natural state to continue to serve its drainage, open space, and wildlife habitat functions.

The contiguous prime agricultural soils along Pinney Hill Road could be left in Christmas tree production or put to some other agricultural use. Open space or recreational uses are also alternatives to keep this area of prime agricultural land available for farming in the future.

Appendix

Soils

0 660'
scale



SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Map Symbol and Soils Series	Septic Tank Absorption Fields	Dwellings with Basements	Roads and Streets	Roadfill	Drainage Class
CrC Charlton very stony fine sandy loam, 3-15% slopes	Moderate, Slope	Moderate, Slope	Moderate, Slope	Good	Well Dr.
**EtA Enfield silt loam, shallow, 0-3% slopes	Severe, Poor Filter	Slight	Moderate, Frost Action	Good	Well Dr.
HrC Hollis very rocky fine sandy loam, 3-15% slopes	Severe, Depth to Rock, Slope	Severe, Depth to Rock, Slope	Severe, Depth to Rock	Poor	Well Dr.
HrE Hollis very rocky fine sandy loam, 15-35% slopes	"	"	"	"	"
*Lg Leicester, Ridgebury, Whitman very stony complex	Severe, Wetness Stones	Severe, Wetness	Severe, Wetness Frost Action	Poor	Poorly Dr.
**MrA Merrimac fine sandy loam, 0-3% slopes	Severe, Poor Filter	Slight	Slight	Good	Well Dr.
**MrB Merrimac fine sandy loam, 3-8% slopes	"	"	"	"	"
*pk Peat and Muck	Severe, Ponding, Percolates Slowly	Severe, Ponding, Low Strength	Severe, Ponding, Frost Action	Poor	Poorly Dr.
**SsA Sudbury fine sandy loam, 0-6% slopes	Severe, Wetness, Poor Filter	Severe, Wetness	Moderate, Wetness, Frost Action	Fair	Mod. Well Dr.

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2.

Map Symbol and Soils Series	Septic Tank Absorption Fields	Dwellings with Basements	Roads and Streets	Roadfill	Drainage Class
**SXB Sutton very stony fine sandy loam, 3-8% slopes	Severe, Wetness	Severe, Wetness	Severe, Frost Action	Fair	Mod. Well Dr.
Tg Terrace Escarpments	Severe, Poor Filter	Slight to Severe	Slight to Severe	Good to Fair	Well Dr.
WXC Woodbridge very stony fine sandy loam, 3-15% slopes	Severe, Percolates slowly, Wetness	Severe, Wetness	Severe, Frost Action	Fair	Mod. Well Dr.

*Inland Wetlands as defined by P.A. 155 as amended
 **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 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.



STATE OF CONNECTICUT
DEPARTMENT OF HEALTH SERVICES
BUREAU OF HEALTH PROMOTION & DISEASE PREVENTION

November 30, 1982

Mr. Robert H. Cassells
South Willington Water Supply
P.O. Box 16
West Willington, Connecticut 06279

RE: Proposed Residential Development on Pinney Hill Road near
South Willington Water Supply

Dear Mr. Cassells:

Based on two site inspections, my review of Mr. Henry Torcellini's nitrogen calculations, and review of ground water and geological maps of the proposed subdivision (Deer Run Estates), I would expect very little adverse effect from the subdivision on the water quality of the South Willington Water Supply. Only four of the proposed lots are located within the secondary recharge area which might effect the groundwater flowing to the South Willington water supply spring. Bacterial contamination from the proposed subdivision does not appear likely to be a problem because of the 400 foot or greater separating distance to the well. Although nitrogen from the septic systems may affect the water quality of the spring, Mr. Torcellini's nitrogen calculations indicate the nitrogen levels would potentially be raised only slightly and therefore should present no serious water quality problems. All of the above considerations are based on assumptions that the subsurface septic systems will be installed and operated properly.

Through this departments' annual nitrogen sampling of the South Willington water supply well, we will monitor the nitrate nitrogen level in the water.

If you have any questions regarding this matter, please contact me.

Sincerely,

A handwritten signature in cursive script that reads "Henry C. Adams".

Henry C. Adams
Sanitarian

HCA:kls

cc: Herbert Klic, Chairman, Planning & Zoning Commission
Hank Torcellini, Gardner & Peterson Associates

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 (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.