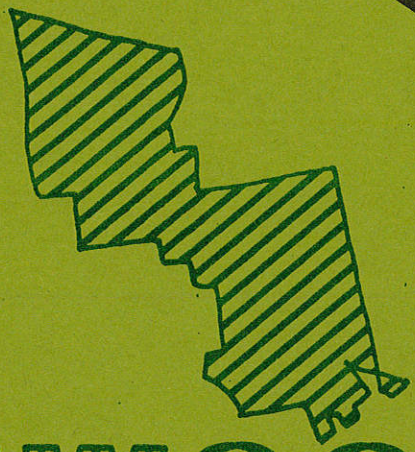
environmental review team report



LYNWOOD HEIGHTS

WATERFORD, CONNECTICUT

RC&D

EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE,
SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES

ENVIRONMENTAL REVIEW TEAM REPORT
ON
LYNWOOD HEIGHTS
WATERFORD, CONNECTICUT

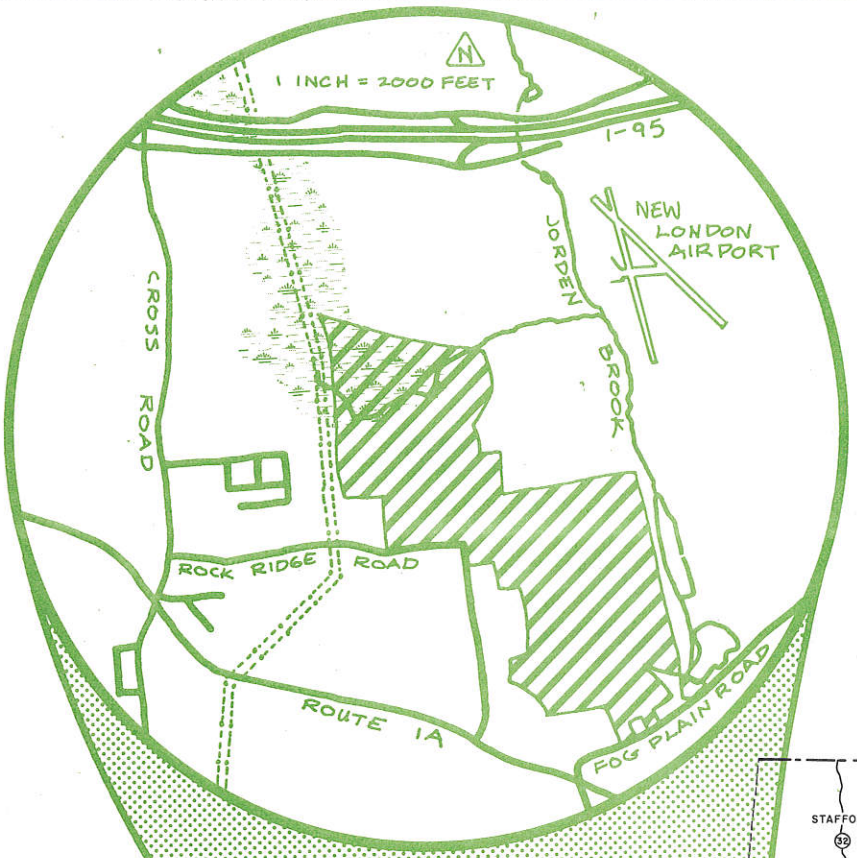
MAY, 1974

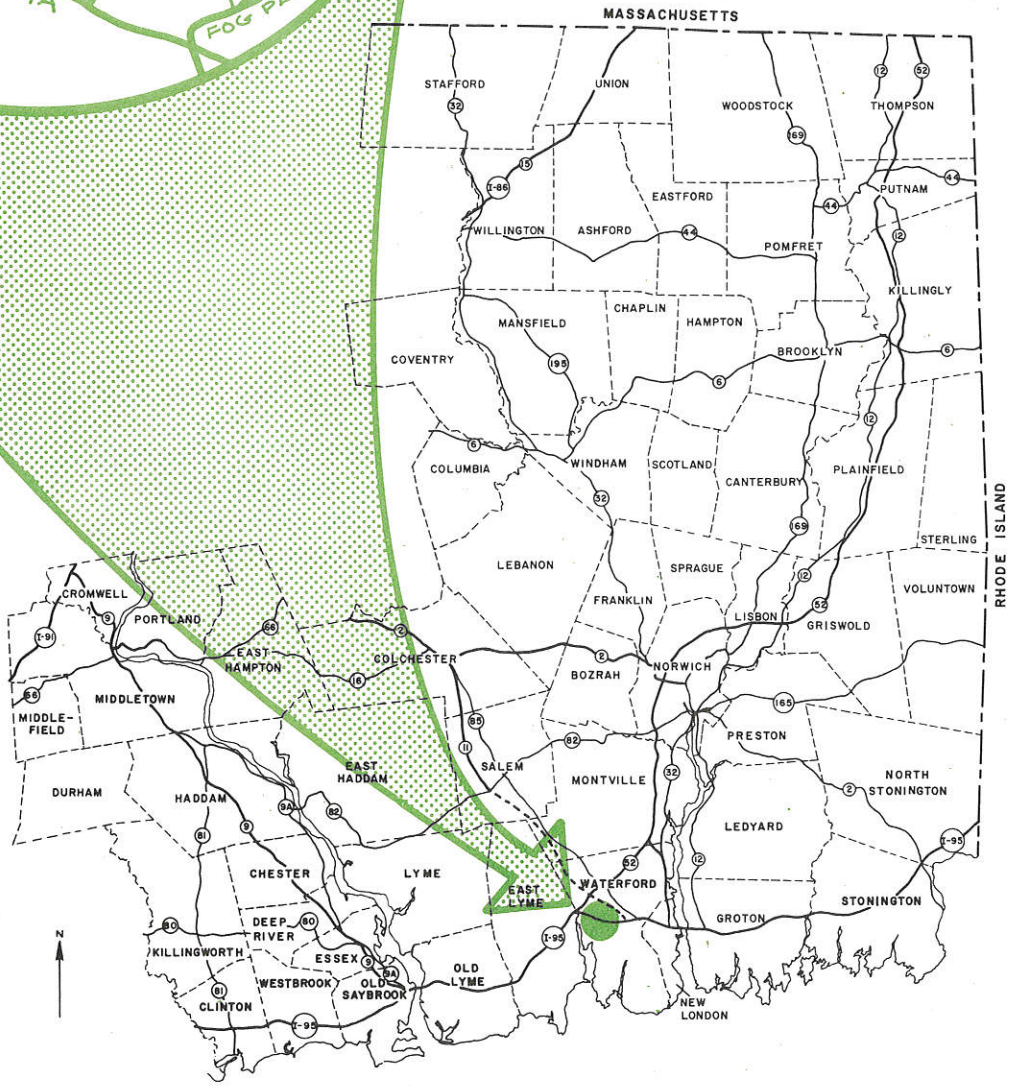
Preparation of this report has been, in part, assisted by a grant from the New England Regional Commission administered by the Southeastern Connecticut Regional Planning Agency

EASTERN CONNECTICUT RESOURCE CONSERVATION
AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

LYNWOOD HEIGHTS
WATERFORD, CONNECTICUT





EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
LYNWOOD HEIGHTS
WATERFORD, CONNECTICUT

This report is an outgrowth of a request from the Waterford Planning and Zoning Commission, with the approval of the owner, Mr. Hugo Wilms, and the developers, George Goldman and Sons, Inc., to the New London County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Executive Council for their consideration and approval as a project measure. The request has been approved and the measure reviewed by the Environmental Review Team.

The soils of the site were mapped by a soil scientist of the USDA Soil Conservation Service. Reproductions of the soil survey and a table of limitations for urban development were forwarded to all members of the Team prior to their review of the site.

The Team that reviewed the proposed development consisted of the following personnel: William L. Lucas, Project Coordinator, Eastern Connecticut RC&D Project, Soil Conservation Service (SCS); Edwin L. Minnick, Engineering Specialist, SCS; Timothy Dodge, Biologist, SCS; Peter Dodds, Student Biologist, SCS; Sidney Quarrier, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); George Cloutier, Forester, DEP; Manuel Cardoza, Jr., Senior Sanitarian, State of Connecticut Department of Health; David R. Miller, Climatologist, Connecticut Cooperative Extension Service (EXT); Rudy Favretti, Landscape Architect (EXT); Thomas H. Seidel, Planner, Southeastern Connecticut Regional Planning Agency; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on April 4, 1974. Reports from each Team member were sent to the Team Coordinator for review and summarization.

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 both the Town of Waterford and the developer. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D 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: Miss Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

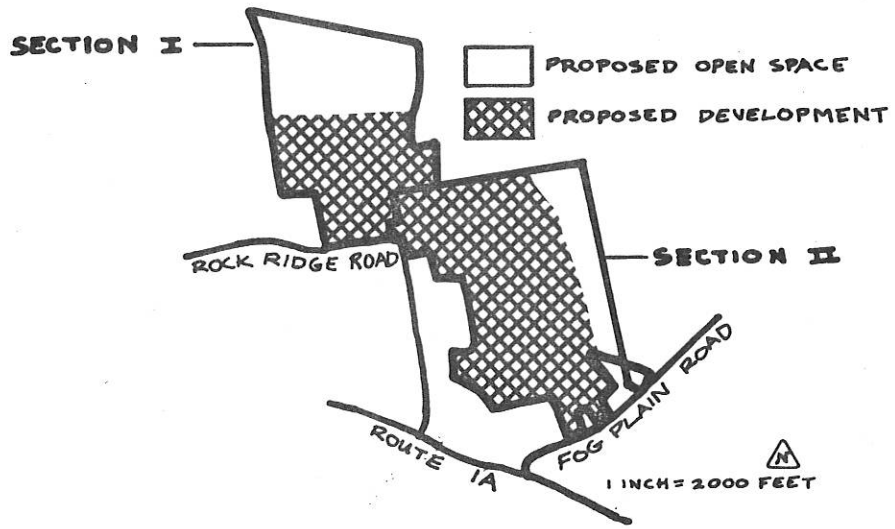
INTRODUCTION

The proposed Lynwood Heights Subdivision encompasses about 175 acres along Rock Ridge Road on Manitock Hill in Waterford. The development is divided into two sections, as shown on the map below. Section I lies to the north of Rock Ridge Road and proposes 61 lots of approximately one half acre each and a 30.5 acre open space parcel in a red maple swamp. Section II, which lies to the east and south of Section I, proposes an additional 90 lots of approximately 30,000 square feet each, with over 16 acres along the steep eastern slopes of Manitock Hill being designated as open space. Though a public water supply will service the development, sewage disposal will have to be on-site.

Being located on a topographic high, the site is quite vissible from other areas of the town, including I-95. Over-development of the property could seriously detract from the scenic quality of the area, as well as increase the downstream flood potential on Jordan Brook.

The major on-site limitations result mainly from steep slopes, stoniness, and occasional areas of high water table. Road construction and location of suitable sites for septic filter fields will encounter the greatest problems.

In the following report, a detailed description of the site will be presented, followed by a discussion of the various phases of development. Information and suggestions are provided for use by the developer and the town in the preparation and review of the development plans. Any comments or recommendations should not be construed as mandatory or regulatory in nature.



EVALUATION

PHYSICAL CHARACTERISTICS OF THE SITE

Section I. The land within Section I of the proposed Lynwood Heights Subdivision generally exhibits gentle to moderate slopes with several small areas of steep slopes (see topography map on opposite page). All of this land drains into the extensive wetland to the north. When the Team visited the area, much of the central portion of the area to be developed was very wet, with water covering the surface. The land on the western part of this area is somewhat better drained.

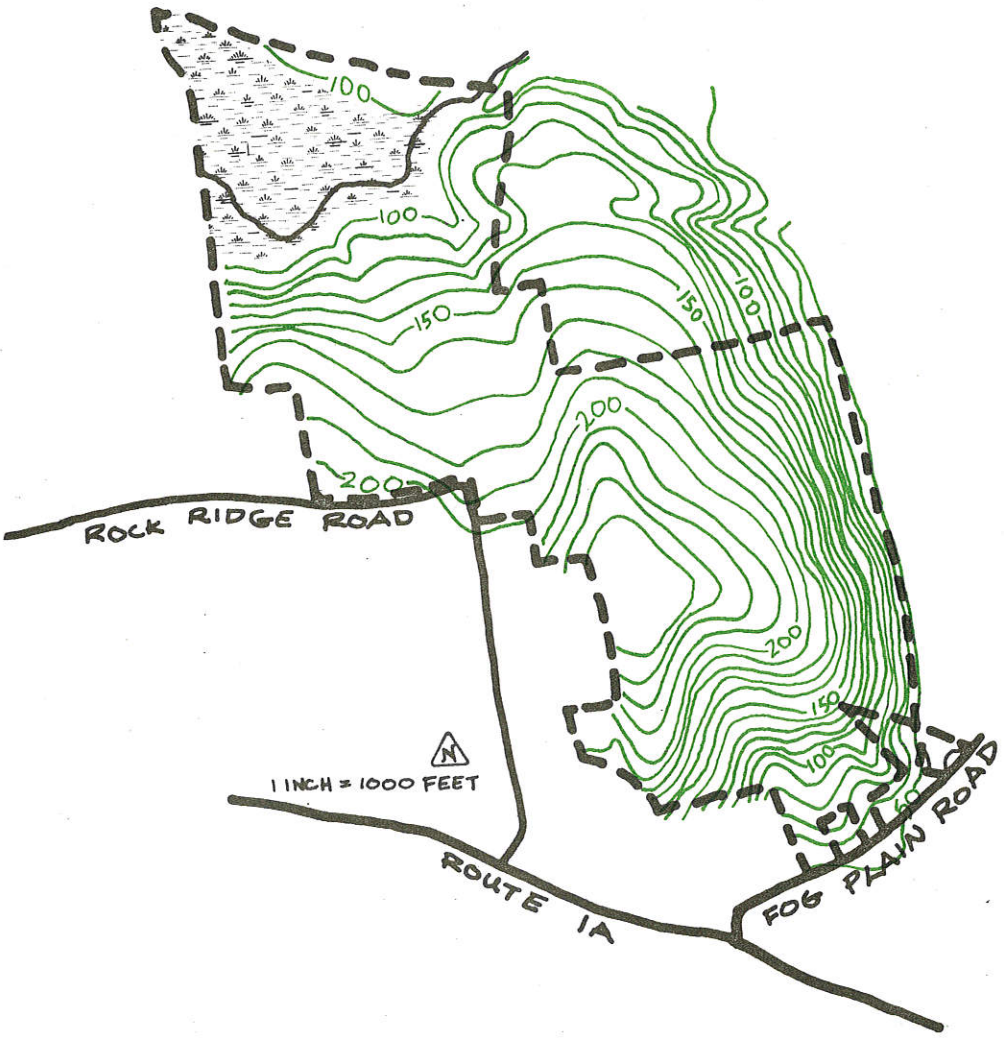
This section is covered by a sandy, bouldery till which has a variable composition and texture. Although the uppermost layers of the ground materials appear to be quite sandy, locally high water tables are present, suggesting that a relatively impermeable layer underlies the surface at a shallow depth. Since the land does not drain a large upslope area, the local high water tables are caused by the retention of ground water and the poor draining characteristics of the underlying ground materials. These materials may be either bedrock or compact till. At several locations bedrock appears to be fairly close to the surface, and local concentrations of boulders are evident. Artificial lowering of the ground water table may be difficult if an impermeable layer does exist at a shallow depth.

The soils in this section vary somewhat.* Soils classified as 291 and 27M (see map in Appendix) are very poorly drained and are legally classified as inland wetlands. Most of the 291 soil lies within the proposed open space area. Plans to drain the 27M soil are proposed in conjunction with the construction of Reuven Street.

A relatively small area along Rock Ridge Road is classified as 35XB, a well drained soil with a slowly to very slowly permeable hardpan at about 2 feet in depth. There may be a temporary perched water table above the hardpan in wet seasons and after heavy rains. Also, water may move laterally down slope over the pan in wet seasons.

* A detailed soils map of the proposed subdivision is given in the Appendix to this report along with a soils limitations chart. Due to the original scale at which the soils are mapped (1" = 1,320') the lines shown on the soils map should not be viewed as precise boundaries, but rather as guidelines to the distribution of soil types on the property. The soils limitations chart indicates the probable limitations for each of the soils for on-site sewage disposal, basements, landscaping, and streets and parking. However, limitations, even though very severe, do not always preclude the use of the land for development. If economics permit greater 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.

TOPOGRAPHY


100
100
150
150
100
200
200
ROCK RIDGE ROAD
200
150
100
60
1 INCH = 1000 FEET
ROUTE 1A
FOG PLAIN ROAD

The remaining soils in this section, 154MBC, 650MBC, and 650 MD, are well to moderately well drained silty upland soils that have developed over friable to firm glacial till. The 154MBC soil has a fluctuating water table which rises to within 15 to 20 inches of the ground surface during the late fall to early spring period.

Section II. The upper portion of this section has slight to moderate sloping land which appears to be quite well drained. It does not exhibit locally high water tables as in Section I. The steeper slopes (in excess of 15 percent) have local concentrations of large boulders and bedrock is exposed down near Jordan Brook. Erosion could be a problem on these slopes during the construction phase of the project.

The dominant soils in this section are 650XC and 650MD, both well drained silty upland soils over friable to firm glacial till. The principal factors limiting development in these soils are stoniness and steep slopes.

WATER SUPPLY

A municipal water supply is available to and will service the site. Installation of underground transmission lines will encounter some difficulty due to the stoniness and boulders. The possibility of an on-site water supply was not considered.

An evaluation of the potential of the Jordan Brook aquifer is beyond the scope of this review. As a general statement, the viability of an aquifer can be partly protected by having lower densities of land uses within the drainage basin and by strictly limiting on-site septic disposal to those areas where the soil conditions are most favorable.

WASTE DISPOSAL

Section I. Public sewers do not appear to be available within the near future, so any development on this site will have to be serviced by on-site sewage disposal systems. Based on the soils map, about 23 percent of the area to be developed in Section I has moderate limitations for on-site septic disposal systems, while 64 percent has severe and 13 percent has very severe limitations. The high seasonal ground water table in some areas and the band of inland wetland soils (27M) present the most severe limitations. Rock outcrops, the possibility of bedrock at shallow depth, and slopes in excess of 10 percent are also principal limiting factors.

With the existing problems of high water tables on portions of this section, an important consideration is that the public water supply will bring additional water to each house lot, to be disposed of through on-lot leaching fields. If each house uses 200 gallons of water per day and a given acre has two houses on it,

approximately 5 inches per acre per year will be added to the ground water through the leaching fields. It is possible that as much as 50 percent of this will be lost through evapotranspiration. This leaves at least 2.5 inches per acre per year which will be added to the local ground water.

Normal precipitation in this area is 45 inches per year, of which about 23 inches are lost through evapotranspiration and 12 inches through run off. This leaves about 10 inches which enters the ground and maintains ground water levels.

The 2.5 inches per year added by the septic fields thus represents a potentially significant increase in the amount of local ground water. The general effect will be to maintain the local ground water levels and possibly to raise them under certain conditions. It is not possible to accurately predict the specific effects, but the additional discharge will tend to aggravate local drainage problems and "seasonal" ground water levels will last longer and occur more frequently.

The installation of roadside drains and basements drains will tend to lower the ground water levels somewhat by draining water out of the ground and discharging it onto the surface where it will flow into the adjacent swamp. Since the septic tank discharges will contribute significantly to the ground water, the possibility exists that the drains will be drawing to the surface the discharges of the leaching fields.

To avoid system failures and/or contamination of nearby ground or surface water, it is recommended that septic tank discharges not be permitted on the wet portion of this section and that the remaining area be developed using significantly larger lots.

Section II. This section of the proposed development does not encounter the ground water and drainage problems of Section I. However, steep slopes and stoniness cause about 20 percent of the area to have moderate limitations and 80 percent to have severe limitations for on-site sewage disposal. Most of these limitations can be reduced or eliminated by good system planning and installation, though it may be necessary to sacrifice some of the aesthetics of a site to ensure the best location for the septic leaching field. Systems should not be installed in or immediately adjacent to areas of excessive slope.

Generally speaking, experience has shown that development on marginal lands should be limited to a very low density with special concern to elevations, soil classification, and lot sizes to achieve successful subsurface sewage disposal.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

The major limiting factors concerning foundation development are the stoniness, steep slopes, and the existence of a high water

table in parts of Section I. With proper site location and/or footing drains, these limitations can be minimized. However, as mentioned earlier, when footing drains are connected to the storm drainage system and on-site waste disposal systems are used, the possibility exists that septic effluent may find its way to the footing drains and from there flow directly to the stream via the storm drainage system.

Surface Drainage. The question of surface drainage in terms of increased runoff, erosion, and flood potential arises with all proposed developments of substantial size. In evaluating this site, a rough analysis was made of the watershed associated with that portion of Section I to be developed, with a drainage area considered to be approximately 40 acres.

The table below is based on the soil cover complex method of computing runoff. Curve number (CN) 62 was used for the present wooded condition, CN 92 for the construction period, and CN 72 for the development when completely established. The storms used were the 2 year (50 percent chance of occurring in any one year,) 5 year (20 percent chance), 10 year (10 percent chance), and 25 year (4 percent chance). The rainfall associated with the above storms are based on U.S. Weather Bureau data for a 24 hour period.

LYNWOOD HEIGHTS, SECTION I,
ANTICIPATED INCREASE IN RUNOFF

LAND USE CONDITION	RUNOFF (In Acre-Feet)			
	2 Year Storm (R*=3.5")	5 Year Storm (R=4.3")	10 Year Storm (R=5.0")	25 Year Storm (R=5.7")
Present Conditions	2.0	3.0	4.8	6.3
During Construction**	8.8	11.4	13.6	16.0
Development Established	3.7	5.6	7.3	9.2

* R = Rainfall

** During Construction reflects the case where the total acreage is developed as a unit as opposed to individual lot development. The method and time of construction can do much to reduce these figures.

The preceding table points out the fact that land use change can have a significant effect on the amount of water (or silt) entering our streams. It also shows that most runoff occurs during the construction period when the soil is least protected against erosion. Thus the need for sediment and erosion measures during construction cannot be overemphasized or overlooked. The Erosion and Sediment Control Handbook for Connecticut, published by the Soil Conservation Service, provides guidelines, standards, and specifications for erosion control measures.

To further understand the above table and its significance, the term acre-foot should be clearly defined. One acre-foot is a volume representing 43,560 cubic feet. In other words, this is the volume attained by flooding one acre of land one foot deep, or two acres of land one-half foot deep.

The total drainage area (watershed) contributing to Jordan Brook at Perry Pond is approximately 3.5 square miles or 2,240 acres. The 40 acres used in the table constitutes less than 1.8 percent of the drainage area. Although it is true that this 40 acres will not have a significant effect on the total water entering Jordan Brook one can readily see what would happen if 40 or 50 percent of the watershed were similarly developed.

As an example, consider the 10 year storm under present conditions and with development established. The amount of increase due to development for the 40 acres is 2.5 acre-feet. If forty percent of the watershed were similarly developed the increase would be 55.6 acre-feet.

The above figures are approximate due to varying watershed characteristics, but they do point out that proper watershed management in the planning stage is one method to control or reduce future flooding. For a development of this size and nature, retarding structures for containing and controlling excess runoff during heavy storms should be considered.

Although Section II of the subdivision was not analyzed for increased runoff, the results would be similar to Section I, except that it encompasses approximately 100 acres, or 4.5 percent of the contributing watershed.

ROADS AND UTILITIES

Much of Rock Ridge Road that now links the proposed subdivision with Cross Road is of gravel construction which we assume will be converted to hard surface if the subdivision is constructed. Due to the steepness of both the existing gravel road that links the subdivision with the Boston Post Road and the proposed extension of Rock Ridge Road to Fog Plain Road, the entrance from Cross Road will probably serve as the main entrance. This will increase the traffic through the existing subdivision on Rock Ridge Road considerably.

The major limiting factor to road construction within the proposed subdivision is the steep slopes. The roads should be planned and constructed using sound engineering principles. Consideration should be given to the degree of slope and surface and subsurface drainage. Cut and fill slopes should be flat enough to establish and maintain erosion resistant vegetation. The method of construction should be flexible enough to permit the smallest amount of exposed soils open to the elements during any one construction period.

HAZARDS

The soils on the site are very erosive and together with the increased runoff during construction, the development could produce severe erosion and sediment problems. Preparation of an erosion control plan prior to construction is recommended.

As shown earlier, the proposed development would increase and accelerate surface water runoff which might cause flooding downstream. A water management system should be prepared prior to construction for this development. This recommendation applies not only to this development, but to all developments in the Jordan Brook watershed.

There will also be an increased potential for contaminates such as septic effluent, salt, and oil to enter Jordan Brook and its associated wetlands. Care should be taken in the placement of septic tank filter fields so that contamination of the wetlands will not occur. Buffer strips along the wetlands should be considered as an added safeguard.

AESTHETICS AND PRESERVATION

Aesthetics. This site has an excellent scenic potential in that on the site are excellent plant specimens, stone walls, and rock outcrops all contributing greatly to the scenic quality. Many fine views also exist on the site. At the same time the site is in a location visible from many parts of the town.

The intense proposed development will destroy a great percentage of the scenic features. If the site were developed less densely, this would not only conserve many of the features, but also respect the soil suitability to a greater degree.

In Section I there are a number of "wolf oaks," large white oak trees which, if saved, could enhance the development. Throughout the site existing stone walls might, in many instances, serve as property boundaries, if the lots were redesigned. In considering the visual effect of the development on the surrounding area, such tools as architectural design, building height, lot size, and landscaping can be used to reduce adverse impact. The natural

forest should be left standing along the contours of the slope and within the entire open space area. This will also assist in preventing severe erosion problems from occurring on the steep, rocky slopes.

Forestry. The forest lands involved on this site are mixed hardwoods, principally oak, maple, ash, hickory, birch, and red cedar. Three age classes are represented: 0-20 years on the burned-over area facing Fog Plain Road; 21-40 years and 41-60 years on the remaining areas. The forest site is fully stocked with medium growth potential, capable of producing 100-250 board feet per acre per year. The proposed open space area in Section I is mostly red maple swamp capable of producing 1/4 to 1/2 cord per acre per year.

Conversion of this woodland to housing will have no great adverse impact on the State's or the Town's forest resources as far as production of forest products is concerned.

The forest resource provides an excellent opportunity to develop a quality living site in contrast to the many open row on row housing developments. It is desirable to preserve the forest effect, particularly since much of the area is visible from long distances. Homes should be placed within a lot with a minimum of disturbance to surrounding forest. Careful placement of cellars, septic and drainage fields, and roads is required to minimize damage to the root systems of desirable trees.

The open space woodland should be kept in large blocks and where possible joined by wide strips. Increased edge effect and wide buffer zones are highly beneficial to wildlife and forest aesthetics. Long wooded strips also lend themselves to nature and hiking trail development.

Prior to construction, trees should be marked so that sawlogs and cordwood can be salvaged. The dead and dying red cedar poles can also be salvaged, or used for rustic fencing. By chipping brush and tree tops, the resulting material can be used for mulch to slow down soil erosion on exposed areas. Lists of sawmills and woodland marketing contractors are available on request from the Department of Environmental Protection, Region IV, R.F.D. #1, Voluntown, Connecticut 06384.

Wildlife. The site presently provides woodland wildlife habitat to game and non-game species including songbirds, raccoon, whitetailed deer, ruffed grouse, squirrels, rabbits, and other animals. The present condition and value of the vegetation to wildlife is good to very good. Wildlife signs indicate that utilization of the area is high.

The habitat is composed of mixed hardwoods, scattered conifers, shrubs, and vines. Dense shrubs, vines, and hardwood sprouts in the 1968 burn area provide very good quality protective cover and food.

Development of the site will have a substantial impact on the wildlife. Habitat quality and quantity will be reduced, forcing the wildlife into surrounding areas. The proposed open spaces will become very important to the wildlife and therefore should be managed, if possible, and protected. Additional areas of open space would be desirable.

Fish. The Connecticut Department of Environmental Protection lists Jordan Brook as a good quality, small trout stream. The wetlands and streams in Section I drain into Jordan Brook and may provide fish habitat as well. They should be protected from erosion and sedimentation, particularly since damage here could also impair Jordan Brook. A buffer strip, approximately 150 feet wide, surrounding the wetland would help protect and ensure the maintenance of this area.

Two man-made ponds, each about 1/8 acre in area and 6 to 8 feet deep are located within the area to be developed in Section I (indicated as holes on site plans). Both ponds have been successfully managed for fish; the smaller to bass and bluegill and the larger to rainbow and brook trout. One or two pairs of waterfowl may nest on these ponds. Both ponds presently provide limited fishing opportunities to area children. The filling in of these ponds would remove them as a resource. However, this would have limited impact on the area, as other ponds (Jordan and Perry) are nearby.

Climatology. The density of development proposed in Section I will cause most of the vegetative cover to be removed. This will increase the intensity and incidence of cold air drainage at night down the slope to the wetlands. This will intensify the frost pocket characteristics of the wetland area.

Clearing on the south and east slopes would have similar effects on downslope areas. This could result in increased heating costs for existing houses on Fog Plain Road. The effect can be minimized by leaving the vegetation on the steep hillsides and having the roads follow the contours as much as possible.

Careful construction on the less steep slopes near the top of the hill would have the least amount of effect on the microclimate of the area.

COMPATIBILITY OF SURROUNDING LAND USES

Immediate surrounding land uses are residential and undeveloped. A small private airport is located about 3/5 of a mile to the northeast of the site. Because the airport now serves small aircraft and is likely to be converted to commercial development in the future, there should be no critical noise problems.

Based on these uses, residential development would be compatible. A five million gallon water storage tank of the City of

New London is located near the western edge of Section II and it would be desirable to buffer it from the development by a forested zone.

ALTERNATIVE LAND USES FOR AREA

Feasible land use alternatives appear to be residential, conservation, recreation, and undeveloped. Because of access, surrounding land uses, and site characteristics, commercial and industrial uses are not feasible alternatives.

The adopted Regional Development Plan for Southeastern Connecticut depicts the area as very low density residential (3 or more acres per family), recreation, conservation, and agricultural uses. The proposed 1973 Waterford Plan by Purcell depicts the area as low density residential and wetland.

In light of the plans for the area, the potential septic problems over much of the site, and the high scenic quality of Manitock Hill, a lower density development with an emphasis on conservation would be desirable. In addition to enlarging lot sizes, there are several ideas which could be considered.

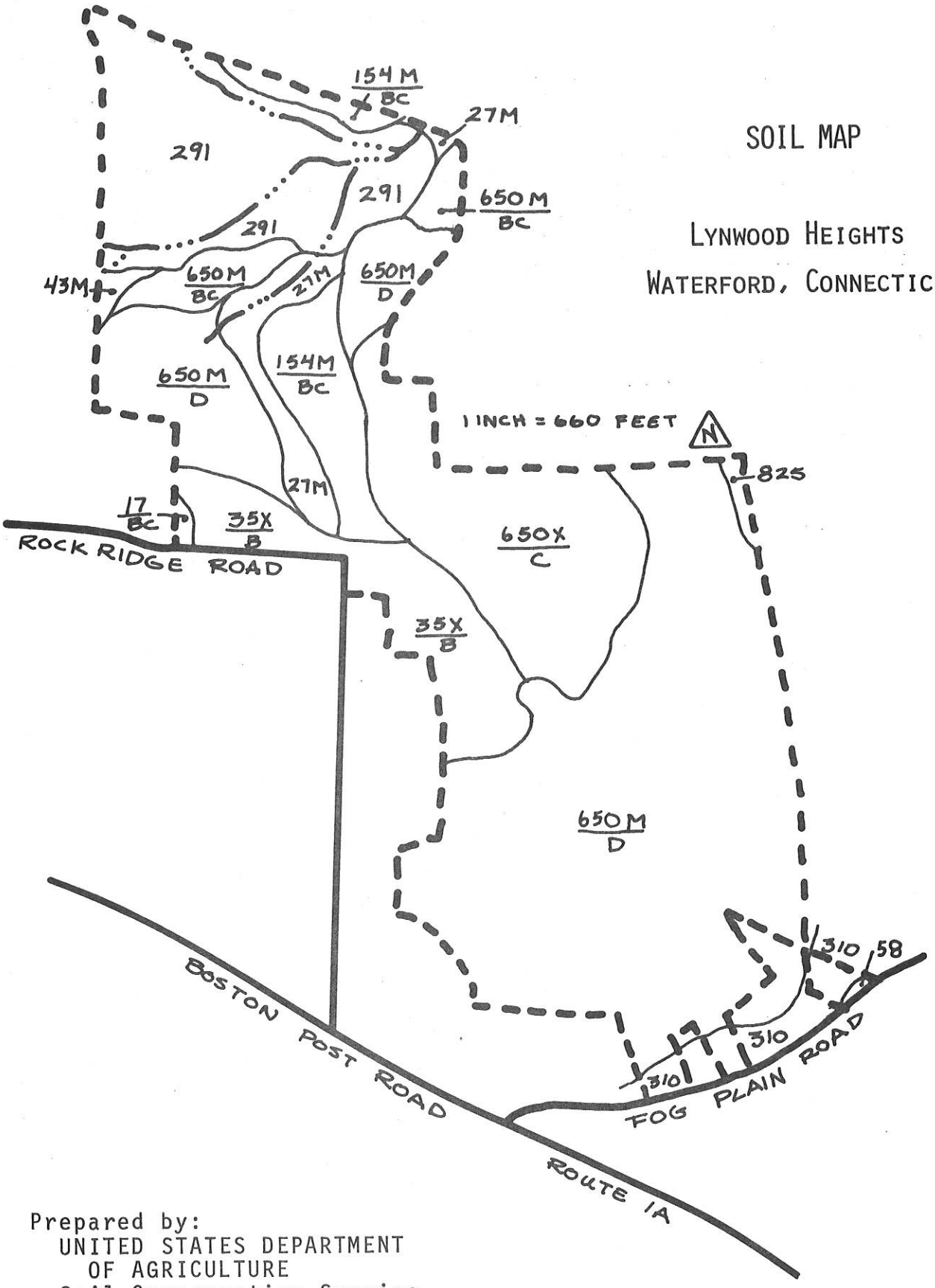
Open space areas could be increased by connecting the two proposed areas with a wide forested strip. The 27M soil in Section I would be much better suited for this type of open space than for residential development. The man-made ponds could also be maintained and used as a focal point for recreation within the subdivision. Activities such as fishing, ice skating, picnicking, and nature walks could be developed here.

As an alternative to residential development, the site would also be well suited to the development, maintenance, and improvement of woodland wildlife habitat. If this area were considered for public open space, it could receive high utilization by wildlife and people.

APPENDIX

SOIL MAP

LYNWOOD HEIGHTS
WATERFORD, CONNECTICUT



Prepared by:
UNITED STATES DEPARTMENT
OF AGRICULTURE
Soil Conservation Service

ADVANCE COPY, SUBJECT TO CHANGE *NOVEMBER, 1971*

SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Acres	Percent of Total Acres	Limitations for:** On-Site Sewage	Base ments	Land-scaping	Streets and Parking	Principal Limiting Factor(s)
A-3b	825	.4	.2	4	4	4	4	High water table.
B-1b	650XC	22.5	12.9	2	1	2	3	Slope 8-15%
B-1c	310, 650MBC	7.8	4.5	2	2	3	3	Stoniness, slope 3-15%.
B-1e	650MD	86.0	49.5	3	3	4	4	Stoniness, slope 15-25%.
B-2a	154MBC	9.5	5.5	3	2	2	2	Stoniness, seasonal high water table.
B-3b	43M	.6	.3	4	4	4	4	Stoniness, high water table.
C-1a	35XB	15.0	8.6	3	1	1	2	Hardpan, slope 3-8%.
C-3b	27M	6.3	3.6	4	4	4	4	Stoniness, high water table.
D-1	17BC	.2	.1	3	3	2	2	Shallowness, slope 3-15%.
E-3a	58	.1	.1	3	3	3	3	Variable drainage and texture.
G-3b	291	25.5	14.7	4	4	4	4	High water table.
		173.9	100.0					

* Refer to Know Your Land, Natural Soil Groups for Connecticut, Soil Conservation Service, USDA Connecticut Cooperative Extension Service, for further explanation of the natural soil groups.

** Limitations: 1-slight; 2-moderate; 3-severe; 4-very severe.

ACREAGE SUMMARY OF SOILS LIMITATIONS

	Slight		Moderate		Severe		Very Severe	
	Acres	%	Acres	%	Acres	%	Acres	%
On-Site Sewage	-	-	30.3	17.4	110.8	63.8	32.8	18.8
Basements	37.5	21.5	17.3	10.0	86.3	49.7	32.8	18.8
Landscaping	15.0	8.6	32.2	18.5	7.9	4.6	118.8	68.3
Streets and Parking	-	-	24.7	14.2	30.4	17.5	118.8	68.3