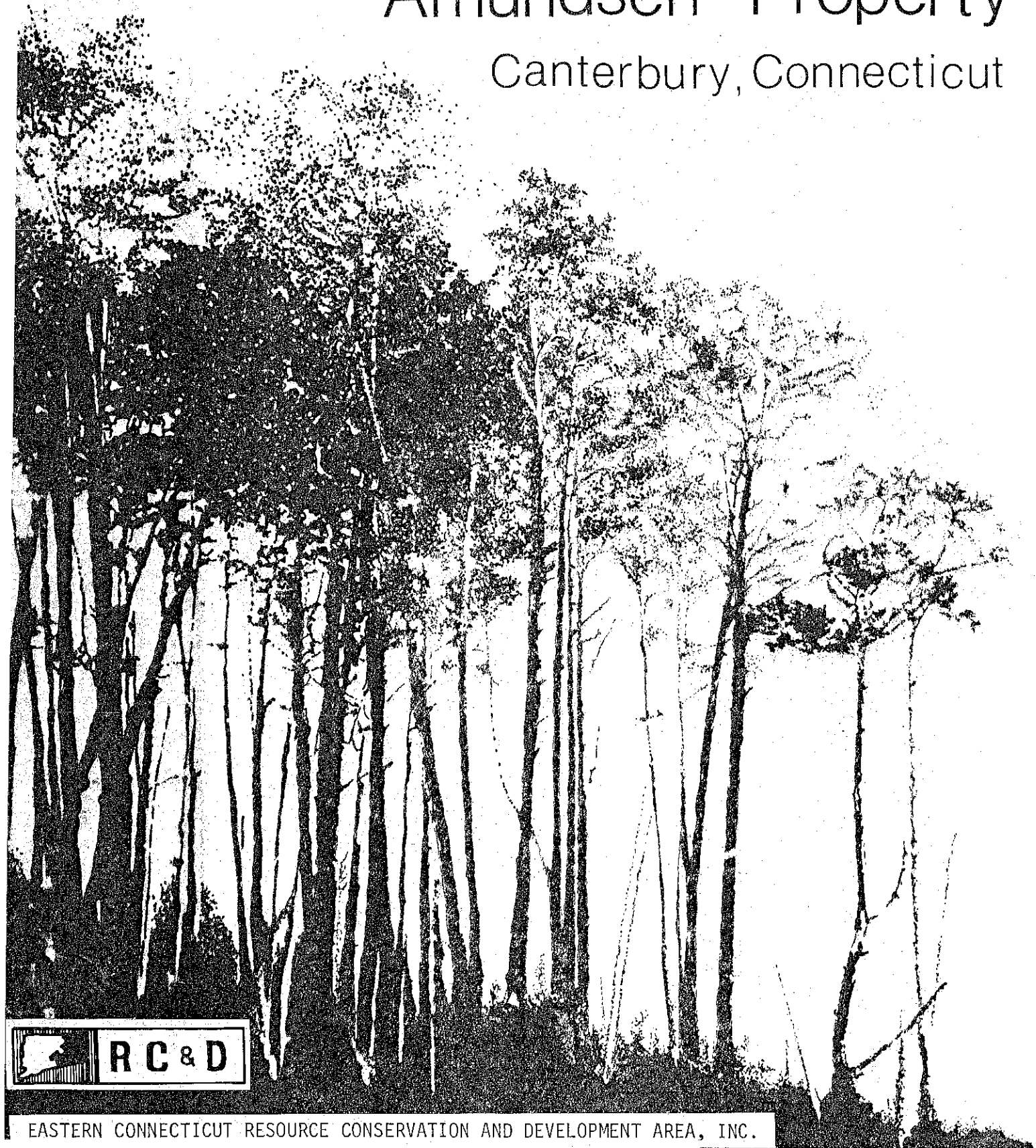


Environmental Review Team Report

Amundsen Property

Canterbury, Connecticut



EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team
Report
on

Amundsen Property

Canterbury, Connecticut

November 1977



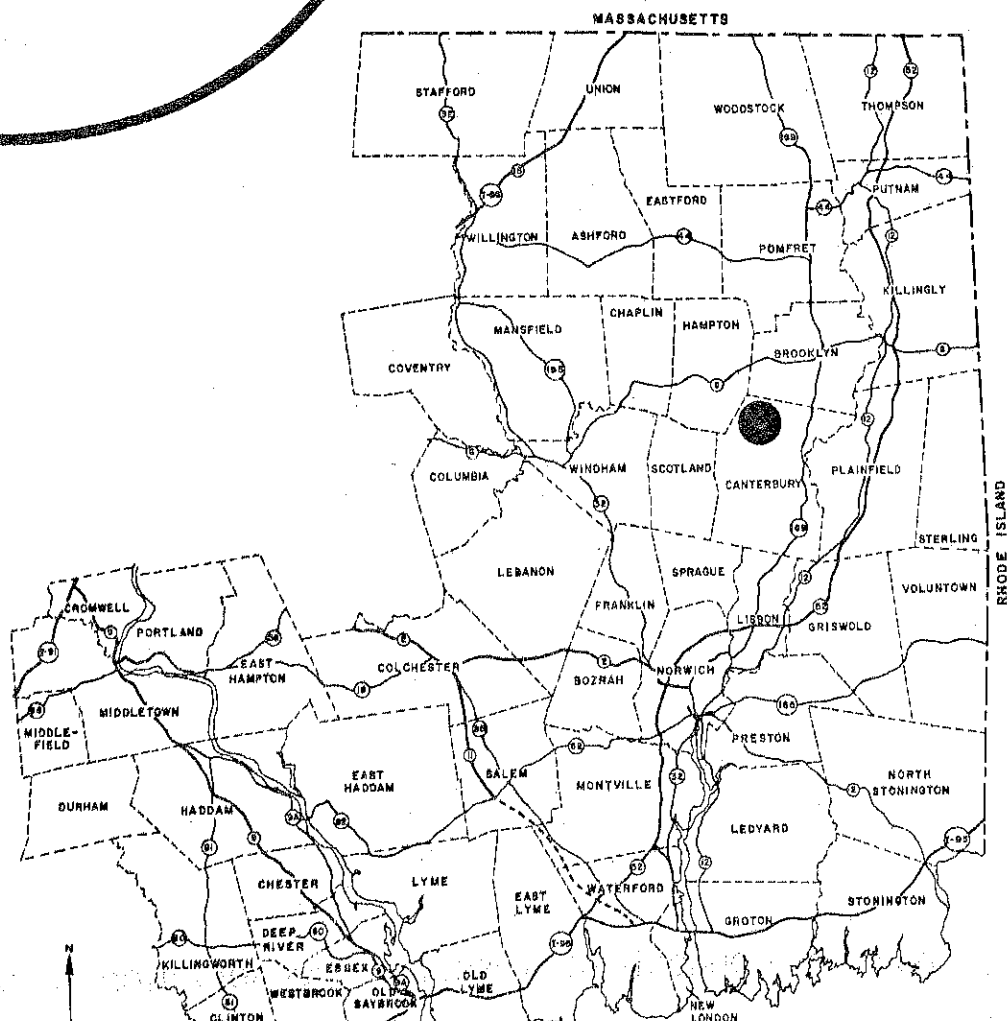
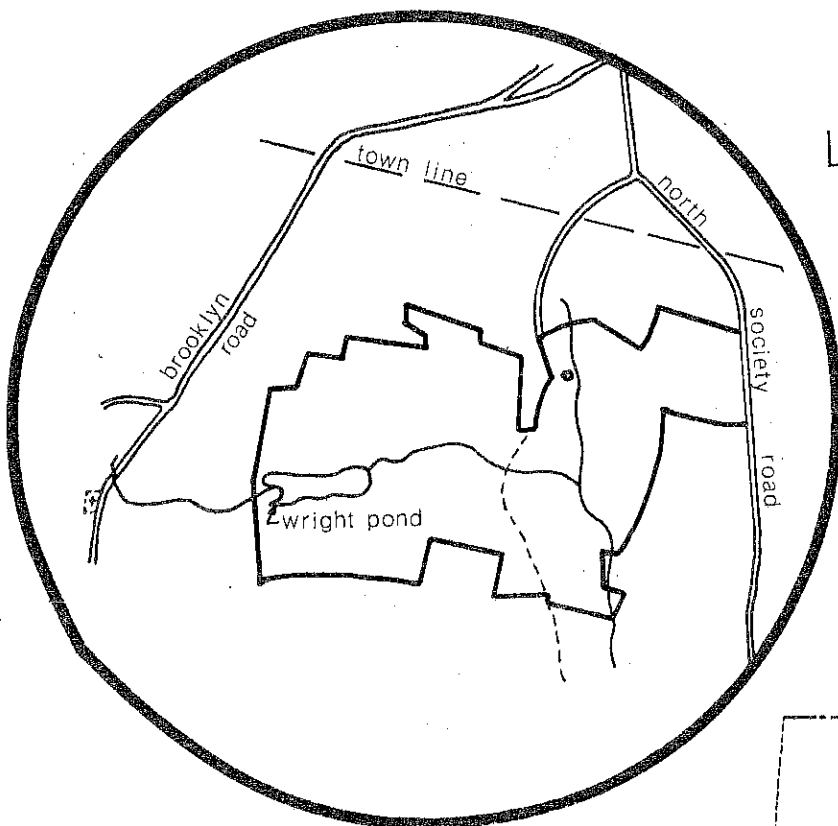
eastern connecticut resource conservation & development area

environmental review team

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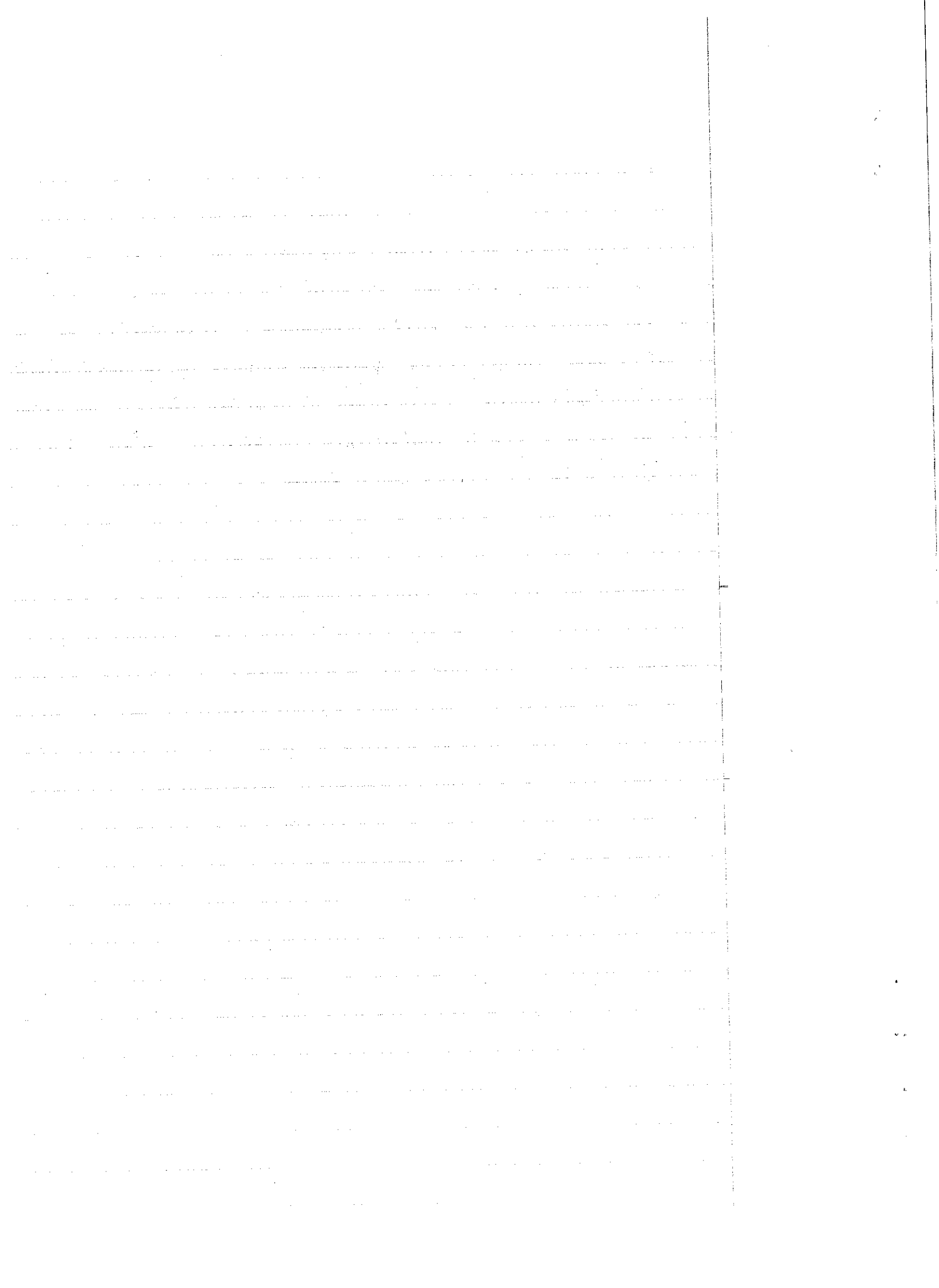
Location of Study Site Amundsen Property Canterbury, Connecticut



**EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT**

Amundsen

- restrictive nature of soils
- contamination of water courses
- asset in mill ruin - old roads
- suitable for passive recreational development
- excellent habitat for water fowl & fish
- potential hazards - rockiness, ruins
- little mining values



ENVIRONMENTAL REVIEW TEAM REPORT
ON
AMUNDSEN PROPERTY
CANTERBURY, CONNECTICUT

This report is an outgrowth of a request from the Canterbury Planning and Zoning Commission, with the permission of the landowner, to the Windham 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 (ERT).

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 soil limitations for urban development were forwarded to all members of the Team prior to their review of the site.

The Team that reviewed the site consisted of the following personnel: Howard B. Denslow, District Conservationist, Soil Conservation Service (SCS); Robert Miller, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); Timothy N. Dodge, Wildlife Biologist, SCS; Justin C. White, Forester, DEP; David Miller, Climatologist, Connecticut Cooperative Extension Service; and William Lucas, SCS, RC&D Coordinator.

The Team met and reviewed the site on June 2, 1977. Reports from Team members were sent to the Team Coordinator for review and summarization.

An additional review on the site was conducted on November 3, 1977 by Howard Denslow, District Conservationist, SCS, and Jeanne Shelburn, the new ERT Coordinator, Eastern Connecticut RC&D area. This review was conducted primarily to familiarize Ms. Shelburn with the site before she compiled and summarized the Team members' reports.

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 Town of Canterbury and the landowner. 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 Council 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 (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.

Introduction

Introduction

The Eastern Connecticut Environmental Review Team was asked to review a 195-acre parcel in Canterbury presently in the private ownership of Dr. Albert L. Amundsen. Dr. Amundsen has proposed several options for development of the site: 1) development of the site by a private "outdoor" club, primarily for fishing or small game hunting; 2) development of the site by the Town as a public recreation facility; 3) development of several large lot residences near Wright's Pond.

The Amundsen Property, located in the northwest section of the Town of Canterbury, is a wooded area with Wright's Pond being its only open water body. Coffey Brook and Kitt Brook also flow through the property, fed by sizable watersheds. The upper regions of Kitt Brook flow through the property in a north-south direction. Coffey Brook feeds Wright's Pond and continues easterly to a junction with Kitt Brook on the eastern portion of the property. From that point Kitt Brook leaves the property at the southeast border and continues to flow in a southerly direction. Kitt Brook also has an extensive wetland complex associated with it, which extends throughout the eastern portion of the property. Coffey Brook and Wright's Pond form a small wetland in the southwest corner of the tract. The tract is characterized by many abandoned roads which are edged on either side by stone walls, by a colonial mill complex ruin, and by general surface stoniness. The vegetation of the site is typical second and third growth hardwood, which covers 90% of the site.

Dr. Amundsen is essentially interested in the "best use" of the land, which is the primary reason that the ERT was invited to review the property. Amundsen's major interest is in preservation of the unique natural features of the tract, which is also an agreeable proposal to the adjoining property owners. All involved hope to retain the forested nature of the tract, developing only nature or hiking trails throughout the property. This would be the type of development which would occur only if a private "outdoor" club were to purchase the property. Dr. Amundsen has contacted the Nature Conservancy and Ducks Unlimited as possible purchasers of the tract. Should none of these organizations or the Town of Canterbury show interest in acquiring this parcel, subdivision development of the parcel will be considered by the owner.

Some aspects of concern raised by the Team members relate to the watercourses on the site and their eventual contamination with siltation or leachates as a result of any development activity. The Team generally views this site as suitable for passive recreational development, such as hunting, fishing, hiking, canoeing, etc. Allowing the property to remain largely as it is or enhancing its significance by restoring portions of the mill and homestead complex would seem to be the "best use" of the land. The Team feels that this area contains significant "natural or cultural heritage or potential scenic and outdoor recreation values" that it should be of public concern and perhaps recommended to the state for permanent preservation.

This report will describe the natural characteristics of the site, including topography, soils, forest cover, and wildlife habitat. The geologist's report

¹ Proposed Conservation and Development Policies Plan, Revision of 1979, State of Connecticut, Department of Planning and Energy Policy, page 98.

will be added as an appendix to this report. Consideration will be given to the compatibility and suitability of the proposals relative to the natural resource base. Comments or recommendations made within the report are presented for consideration by the landowner and the Town in the preparation and review of the development plans, and should not be construed as mandatory or regulatory in nature.

Environmental Evaluation

Soils

A detailed soils map of this property is included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban and recreational uses. As the soil map is an enlargement from the original 1,320'/inch scale to 660'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the property. The soils limitation chart indicates the probable limitations for each of the soils for camp areas, picnic areas, playgrounds, trails, streets and parking lots, landscaping, athletic fields and service buildings without basements. 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 Interpretations: Windham County, Connecticut, can aid in the identification and interpretation of soils and their uses on this property. 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 Amundsen property consists of several natural soil groups, ranging from Group A--terrace soils over sands and gravels to Group F--marsh and swamp soils. The majority of soils on the site are derived from glacial till, with wetland soils covering more than 25% of the parcel. Hinckley, Gloucester, Montauk, Paxton, Ridgebury and Saco soil series are most representative of the site.

The Hinckley Series (A-16) are excessively drained soils developed in stratified sandy, gravelly and cobbly water deposits. These deposits, normally deeper than 10 feet, are located on undulating to rolling terrace topography above the present overflow of large streams. They have rapid to very rapid permeability in the subsoil. The water table is below 40 inches during most of the year. Typical slope for this soil ranges from moderate to steep. Most use problems are related to texture, droughtiness and rapid to very rapid permeability.

The Gloucester series (B-1a) are somewhat excessively drained soils developed in upland till, mainly from granite bedrock. These soils are normally deeper than 4 feet. They are rapidly permeable. Below 40 inches, slowly permeable layers may be present. The water table is normally below 40 inches during most of the year. The Gloucester soils are naturally stony and contain few to many stones throughout the soil. Gravel size rock fragments generally make up 10 to 30% of the surface and subsoil. Most slopes associated with these soils range from moderate to very steep. Development problems are related to slope and stoniness.

The Montauk series (C-1a), are well drained upland soils with slowly to very slowly permeable fragipan at depths of 30 to 40 inches. The subsurface and subsoil textures above the fragipan are very friable to friable fine sandy loams. There may be a temporary perched water table above the fragipan in wet seasons. Due to restricted internal drainage, water moves laterally down the slope over the pan in wet seasons and after heavy rains. Montauk soils are on slopes ranging from gently sloping to steep. Problems are related to poor drainage, stoniness and slope.

The Paxton series (C-1e), are well drained soils with a slowly to very slowly

permeable fragipan at approximately 2 feet in depth. The surface and subsoil textures above the fragipan are very friable to friable fine sandy loams. The fragipan restricts internal drainage, resulting in a temporary perched water table in wet seasons and after heavy rains. Seep spots occur seasonally on slopes as the water moves laterally down slope over the pan. Paxton soils are on slopes ranging from gently sloping to steep. Surface stoniness varies from essentially stone free, on areas where stones have been removed, to extremely stony. Development problems are concerned with the slowly permeable hardpan, stoniness and slope.

The Ridgebury series (C-3b) are somewhat poorly to poorly drained soils developed in silty or fine silty or fine sandy loam material with a hard pan 18 to 24 inches deep. These soils, normally deeper than 4 feet, occupy low-lying nearly level upland areas. They are slowly to very slowly permeable in the subsoil. Ridgebury soils are naturally stony and contain few to many stones throughout the soil. The water table is near the surface from late fall through early spring. Most problems are related to the slowly to very slowly permeable subsoil and long seasonal high water table.

The Saco series (E-3b) are very poorly drained soils developed in recent floodplain sediments. These sediments, normally deeper than 10 feet, are high in silts and very fine sands. Stratified sands and gravels may occur below 20 inches. They flood frequently and have moderate permeability in the subsoil. The water table normally rises to the surface during most of the year. Most development problems are related to frequent flooding and high water table.

The most important development considerations which should be examined on this site are excessive surface rockiness, wetlands, poor drainage and, in some areas, slope. Maintaining the present quality of the environment, including water quality, is also an important factor. Disruption of the land, such as that associated with large scale timbering or subdivision development, could have an adverse effect.

Should this property ever be used for residential development, on-site sewage disposal would be necessary. Proximity of leaching fields to the existing watercourses and associated wetlands would be an important consideration in the designation of individual lots on any site plan. The till soils could perch leachates, and the groundwater could convey them laterally to lower wet areas causing contamination. There would also be concern with necessary conservation measures being taken to prevent erosion, runoff and sedimentation of the water courses during any development on this site.

Connecticut's Erosion and Sediment Control Handbook published by the Soil Conservation Service will aid both the developer and the Town in preparing and approving an adequate erosion and sediment control plan. Standards and specifications for both mechanical and vegetative practices listed within the Handbook are available at the Windham County Soil Conservation Service office, Brooklyn, Connecticut.

Development costs for this site may be prohibitive, due to the excessive surface stoniness and measures which would have to be taken in building on soils with high water tables. Bulldozers and pumping equipment could cause excessive environmental damage, resulting in erosion and sedimentation problems which would be costly to correct. In general, large scale subdivision construction on this site could not be recommended as enhancing environmental quality or the long-term economics of land use in this area.

Climate

There are no severe climatic limitations to any use of the site. The area is located in the Northeastern Connecticut hills region, therefore the climate is basically mild and humid in all seasons. When low pressure weather systems bring air flow from the south, the area experiences humid maritime conditions especially in the winter and spring seasons. When high pressure systems prevail, the area experiences relatively cool dry weather, which are the prevailing summer and fall season conditions.

The following data was taken from the Climate of Connecticut, Bulletin of the Connecticut Geological and Natural History Survey.

Annual mean temperatures	48°F
Probability of winter temperatures going below 0°F	2 in 5
Probability of summer temperatures going above 90°F	2 in 5
Annual heating degree days	6400
Precipitation (mean annual)	46 inches
Snow depth (mean annual)	45 inches

The surrounding topography is gentle and thus does not influence the local climate in any limiting manner. Since the area is currently below the state limits for various air pollutants, the ambient air quality should not change with regard to the uses planned for this site. Changes in air quality will occur when I-84 is completed along the southern edge of the area.

Solar Energy Availability

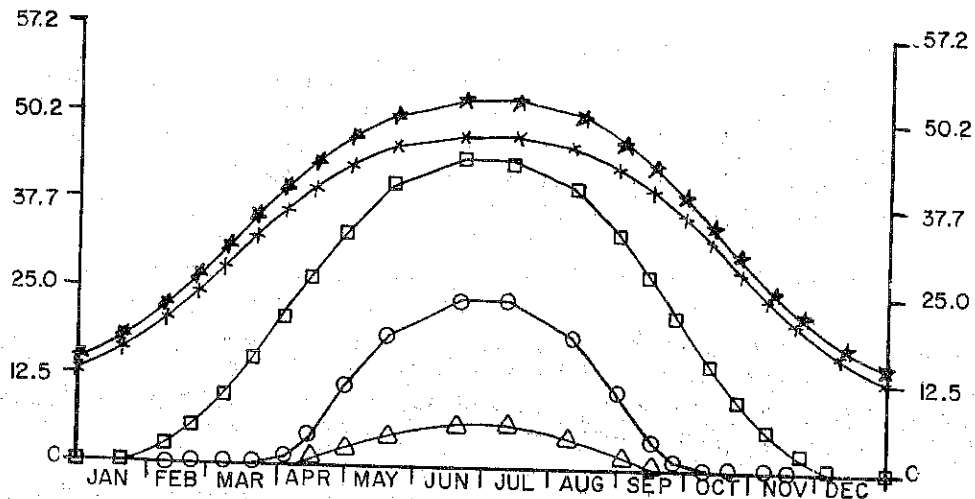
From the following graphs, it should be apparent that the site's south facing slopes are best suited to the utilization of solar energy. It should be pointed out that the isograms (the lines on the graph connecting the point values) show the approximate maximum potential solar radiation for clear days. In actuality, in this region of the country there is cloud cover, on the average, 1/2 of the time in winter, and 1/3 of the time in summer. This is substantiated by the data which appears in the following table.

<u>Average number of hours of daily sunshine</u>		<u>Approximate day lengths</u>
January	4.5	9 hours
February	6	10 hours
March	6	12 hours
April	7	13 hours
May	8	14 hours
June	9	15 hours
July	9	15 hours
August	8	13 hours
September	7	12 hours
October	6	11 hours
November	5	10 hours
December	4.5	9 hours

During cloud cover periods, the solar radiation is reduced to less than 10% of the potential values shown. It should also be pointed out that the figures

DAILY TOTALS OF DIRECT SOLAR RADIATION AT 40 DEGREES NORTH LATITUDE

POTENTIAL INSOLATION (Watts/cm²)



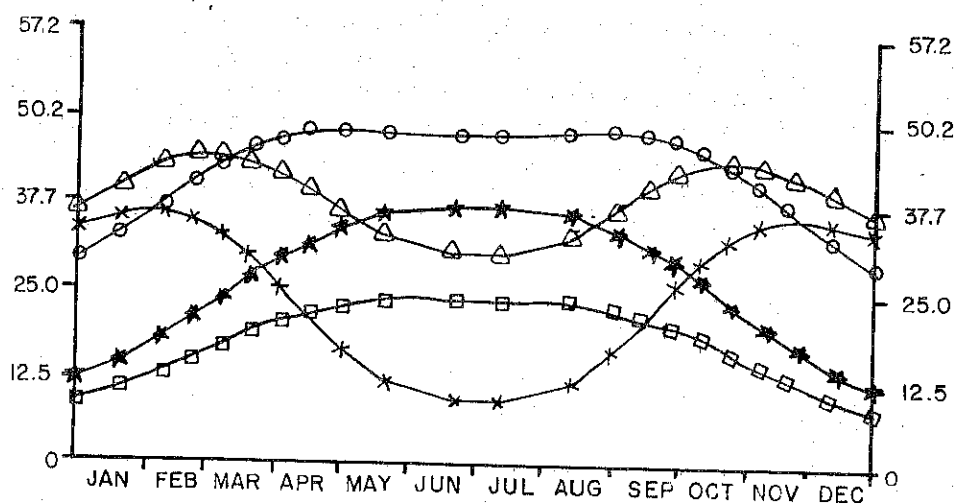
MONTH

DEGREE & DIRECTION
OF SLOPES

- ★ LEVEL
- N 30
- N 60
- △ N 90
- × E 30

NORTH AND EAST SLOPES

POTENTIAL INSOLATION (Watts/cm²)



MONTH

DEGREE & DIRECTION
OF SLOPES

- ★ E 60
- E 90
- S 30
- △ S 60
- × S 90

SOUTH AND EAST SLOPES

on the table are averages and that cloud cover periods generally last several days at a time or longer. Thus the average amounts of energy collected may be sufficient for limited periods, but enough radiation for power generation cannot be depended on for a day after day basis during extended periods of cloud cover.

Forest Cover

The site is currently occupied by a mixed hardwood forest, composed of red, black, scarlet and white oak; red and sugar maple; black and yellow birch; various hickories and white ash. The oaks predominate the stands for the most part. Associated white pine and hemlock are also present in small sections of the property. The general health and vigor of the stand is fair.

The stand is unevenly aged and unevenly sized, with a mixture of pole saw timber trees. Excellent access to most of the woodlot could be provided with minor improvements to the existing system of old roads which run throughout the property. Given the ready access present, much of the improvement work that should be applied to the stand could be accomplished through silviculturally designed cordwood sales for thinnings, cull tree removal, etc.

If the property is to remain in forest land, a management program should be instigated to utilize the resource present and to provide for improvements to the forest stand in the future. The emphasis of management should be towards encouragement of the more valuable and useful species of trees, such as white ash, sugar maple and red oak as related to the growing sites available on the property. As previously mentioned, white pine is present in some areas of the property, and, on sites better suited to this species, it should be encouraged.

Present stand conditions indicate a saw log harvest of mature trees and damaged or diseased trees that would not survive or would become unmarketable in the near future. A harvest of this type would provide revenue to the landowner, but more importantly it would provide a necessary thinning to improve growth on the residual stand by providing growing room for crown development and eliminating competition for light from above and moisture and nutrients in the soil.

The woodlot has the potential, through management for providing a steady source of income for the landowner as well as providing forest resources and associated social values for the future. It should be emphasized that the first step in management is to develop a management plan with the capabilities of the landowner and the resource potential available. This should be accomplished through the efforts of a professional forester to assure the best silvicultural practices are followed and to maximize financial returns over the long run to the landowner.

Wildlife

The 195-acre parcel is almost entirely wooded with second and third growth mixed hardwoods. Two small fields, probably less than 5 acres in total, are established in grasses. Quality of the habitat is fair to good. Generally, sunlight penetration is reduced by crown closure, limiting production of fruiting shrubs and desirable plants for browse. The grasses in the two fields add diversity to the vegetation and create edge for wildlife in an otherwise solid woodland

area. Wright's Pond, the major body of water on the site, is shallow (less than 5 feet in depth) and covers approximately 10 acres in surface area. It is fringed with emergent vegetation and provided a marsh type habitat to waterfowl and small fur bearing mammals.

Fishing on Wright's Pond is of local significance, generally for warm water varieties of fish, such as grass pickerel, bullhead, yellow perch, bluegills and large mouth bass. Kitt Brook, a swift flowing stream which runs through the property, is stocked with trout by the state and may contain 4 to 6-inch native brook trout on the Amundsen land.

The marshy fringes of Wright's Pond provide waterfowl habitat to ducks such as mallard, black and wood duck. Beaver have been active in past years and muskrat may be present in the upper pond areas.

The woodland areas provide elements of habitat to both game and non-game species of birds and mammals, including seasonal songbirds, white-tailed deer, raccoon, ruffed grouse, chipmunk, grey squirrel, opossum and other woodland animals.

Whatever the final use of this property, care should be taken to protect the water quality of the streams. The major threat is from sediment which could enter the stream if the vegetative cover were removed from the relatively steep slopes. Implementation of a "streambelt" zone would help ensure stream protection.

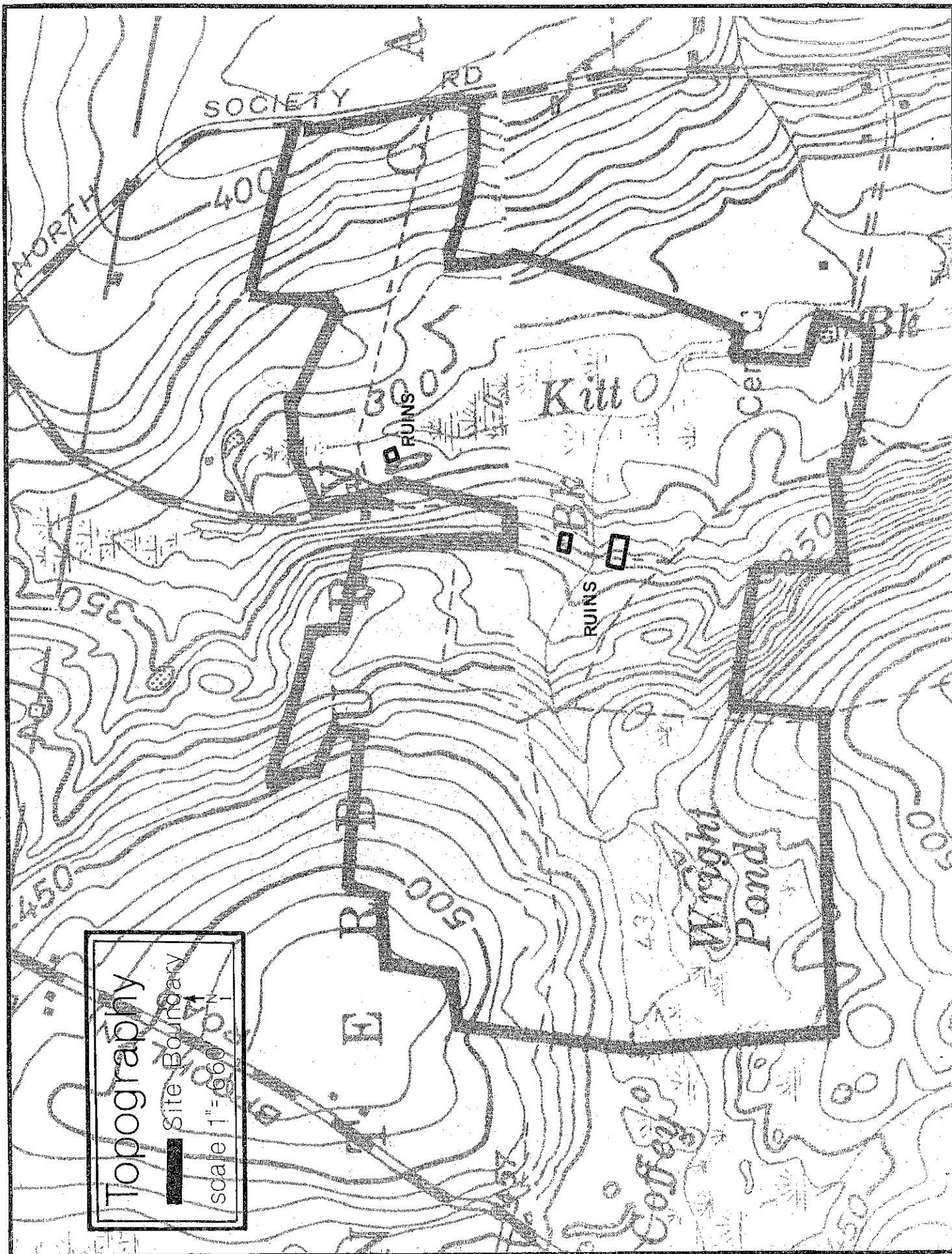
Compatibility With Surrounding and Future Plan Land Uses

The proposed use of the Amundsen property for a public or private recreation area is compatible with the present surrounding land use. Adjacent property is generally in large lot residential usage.

That portion of the site which is developable is likely to come under some amount of development pressure when the extension of I-84 is completed. Small scale, large lot development would be a possibility which would probably not change the character of the area radically. However, large scale development of any kind would not only destroy the unique physical features of the site but could also cause widespread environmental quality loss affecting the watershed with flooding due to surface runoff and contamination of the watercourses and wetlands.

Historical Features

This site is unique in that it contains the ruins of the former Jediah Morse Homestead and Mill complex as well as numerous abandoned roads which are lined on either side by stone walls. These elements may be of interest to the local historical society or the Canterbury Community at large for some form of restoration or the development of an historical park. The foundations of all these structures appear to be in good condition and would require only minor repairs for this type of development. Canterbury should keep in mind the fact that funding and volunteer labor from student historians and archeologists would probably be available if the community was interested in undertaking this type of project.



Potential Hazards

Should the property be developed for public recreation, liability problems may arise from the "attractive nuisances" created by the lake and swift-flowing streams. The streams form the major hazard, as the streambeds are primarily composed of sharp angular rocks which could cause serious injury, if someone were to fall in while playing. The remnants of foundations and a well at the Jediah Morse homestead site could cause similar problems, if access was not controlled.

Recreational Potential

The value of retaining this parcel as open space lies in its natural wildlife habitat, its potential for the development of a passive recreation area and its possible use as an educational tool through the Jediah Morse homestead and mill complex.

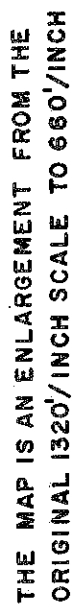
Wright's Pond now provides an excellent habitat for waterfowl and certain species of fish. Other fishing and open water duck habitat could be constructed with few problems and minor expense. As Wright's Pond is part of a rather large wetland complex, potential for a clear water pond and swimming facilities is limited. The area is probably put to best use by the existing natural wildlife of the pond and wetland complex.

The old roads lend themselves well to short hikes, and colonial history enthusiasts are provided with interesting rambles in the early American mill complex. The steep slopes on the site, however, limit the potential for intensive development for organized recreation activities (i.e. baseball, tennis, etc.). Passive activities or moderately active forms of recreation such as canoeing or horseback riding would be adaptable to this site with only slight modification of its natural state. It would also be an excellent site for interpretive nature trails due to the rich native flora and the number of rare species on the property.

This property should be considered a valuable recreational resource for the Canterbury area. Considering trends in the rest of the state or the country, it is inevitable that this land will soon be under pressure for rural development, particularly if the proposed extension of I-84 should cross the parcel's southeast corner. Although the property may be expensive to the Town or a private group at this time, should this opportunity pass, the parcel may never be available for recreational development again. Federal and state funding is available for towns interested in preserving these types of areas. They generally fall into the category of matching grants, 50% provided by the federal government, 25% provided by the state and 25% provided by the town. Specific information on acquisition grants can be derived from the Windham County SCS office or the Northeastern Connecticut Regional Planning Agency.

Appendix

AMUNDSEN PROPERTY
CANTERBURY, CONNECTICUT



ADVANCE COPY, SUBJECT TO CHANGE

AMUNDSEN PROPERTY

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR RECREATIONAL USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*				
					Camp Areas	Picnic Areas	Play-Ground	Paths & Trails	Pond Reservoir Area
Hinckley-Windsor	213C	38	.19	Slope, stony, droughty	2	2	3	1	Slope, seepage
Hinckley	213D	5	.03	Slope	3	3	3	3	Slope, seepage
Sudbury	455A	3	.02	Slope, wetness	2	1	2	1	Slope, seepage
Sudbury	455B	3	.02	Slope, wetness	2	1	3	1	Slope, seepage
Gloucester	11XB	2	.01	Slope, droughtiness	2	1	3	2	Percs. rapidly, deep to water, large stones
Canton-Charlton	3MC	1	.005	Slope, stoniness	3	2	3	3	Seepage, slope
Gloucester	11MD	6	.03	Slope, stoniness	3	3	3	3	Percs. rapidly, deep to water, large stones
Paxton	35XB	7	.03	Stony, seasonal wetness	2	1	3	2	Favorable, slope
Montauk	85XB	10	.05	Stones	2	1	3	2	Slope
Paxton	35XC	1	.005	Slope	2	2	3	2	Favorable, slope
Paxton	35MC	17	.08	Stones	3	2	3	3	Favorable, slope
Montauk	85MC	16	.08	Slope, stones	3	2	3	3	Slope
Paxton	35MD	4	.02	Slope, stones	3	3	3	3	Favorable, slope

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*				
					Camp Areas	Picnic Areas	Play-Ground	Paths & Trails	Pond Reservoir Area
Montauk	85MD	6	.03	Slope, stones	3	3	3	3	Slope
Woodbridge	31XB	13	.07	Stones	2	1	3	2	Slope, large stones
Woodbridge	31MC	9	.05	Stones	3	3	3	3	Slope, large stones
Ridgebury & Whitman** 43M		38	.19	Wetness	3	3	3	3	Favorable, slope
Saco** 823		9	.05	Wetness	3	3	3	3	Seepage
Carlisle Muck** 93		7	.04	Wetness	3	3	3	3	Percs. rapidly

* Urban Use Limitations: 1 = slight; 2 = moderate; 3 = severe.

** Inland Wetland soils.

AMUNDSEN PROPERTY

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR COMMUNITY DEVELOPMENT

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*				
					Septic Tank Absorption Fields	Dwellings Without Basements	Dwellings With Basements	Local Roads & Streets	Lawns, Land-scaping
Hinckley-Windsor	213C	38	.19	Slope, sandy	2	2	2	2	2
Hinckley	213D	5	.03	Slope, droughtiness	3	3	3	3	3
Sudbury	455A	3	.02	Wetness	3	3	3	2	1
Sudbury	455B	3	.02	Wetness	3	3	3	2	1
Gloucester	11XB	2	.01	Large stones	2	2	2	1	2
Canton & Charlton	3MC	1	.005	Large stones, slope	2	2	2	2	2
Gloucester	11MC	6	.03	Slope	3	3	3	3	3
Paxton	35XB	7	.03	Percs. slowly, Wet, Frost Action	3	2	2	2	2
Montauk	85XB	10	.05	Percs. slowly, Large stones	3	2	2	2	2
Paxton	35XC	1	.005	Percs. slowly, wet, large stones	3	2	2	2	2
Paxton	35MC	17	.08	Percs. slowly, wet	3	3	3	2	3
Montauk	85MC	16	.08	Slope, large stones	3	3	3	2	2

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*				
					Septic Tank Absorption Fields	Dwellings Without Basements	Dwellings With Basements	Local Roads & Streets	Lawns, Land- scaping
Paxton	35MD	4	.02	Slope	3	3	3	3	3
Montauk	85MD	6	.03	Slope, large stones	3	3	3	3	3
Woodbridge	31XB	13	.07	Slope, wet, percs. slowly	3	3	3	3	2
Woodbridge	31MC	9	.05	Slope, wet	3	3	3	3	3
Ridgebury & Whitman**	43M	38	.19	Percs. slowly, wetness	3	3	3	3	3
Saco**	823	9	.05	Floods, wetness	3	3	3	3	3
Carlisle Muck**	93	7	.04	Floods, wet	3	3	3	3	-

* Urban Use Limitations: 1 = slight; 2 = moderate; 3 = severe.

** Inland Wetland soils.

SOIL AND NATURAL SOIL GROUPS

<u>Soil Map Symbol</u>	<u>Soil Name</u>	<u>Natural Soil Group</u>
213C	Hinckley-Windsor complex, 3 to 15% slopes.	A-1b
213D	Hinckley gravelly sandy loam, 15 to 35% slopes.	A-1c
455A	Sudbury sandy loam, 0 to 3% slopes.	A-2
455B	Sudbury sandy loam, 3 to 8% slopes.	A-2
11XB	Gloucester very stony fine sandy loam, 3 to 8% slopes.	B-1a
3MC	Canton-Charlton extremely stony fine sandy loam, 3 to 15% slopes.	B-1c
11MD	Gloucester extremely stony fine sandy loam, 15 to 35% slopes.	B-1e
35XB	Paxton very stony fine sandy loam, 3 to 8% slopes.	C-1a
85XB	Montauk very stony fine sandy loam, 3 to 8% slopes.	C-1a
35XC	Paxton very stony fine sandy loam, 8 to 15% slopes.	C-1b
35MC	Paxton extremely stony fine sandy loam, 3 to 15% slopes.	C-1c
85MC	Montauk extremely stony fine sandy loam, 3 to 15% slopes.	C-1c
35MD	Paxton extremely stony fine sandy loam, 15 to 25% slopes.	C-1e
85MD	Montauk extremely stony fine sandy loam, 15 to 35% slopes.	C-1e
31XB	Woodbridge very stony fine sandy loam, 3 to 8% slopes.	C-2a
31MC	Woodbridge extremely stony fine sandy loam, 3 to 15% slopes.	C-2b
43M	Ridgebury & Whitman extremely stony soils,	C-3b
823	Saco silt loam.	E-3b
93	Carlisle muck.	F-1

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.

AMUNDSEN PROPERTY - GEOLOGIST'S REPORT

Bedrock Geology

The entire site is underlain by a bedrock type known as the Tatmic Hill Formation. This metamorphic formation is divided into two distinct Members, the Yantic Hill Member and the Fly Pond Member, both of which are visible on the site. Neither of these has any potential for mining.

The Yantic Member is characterized by being medium to dark gray in color and having a fine to medium grain texture. The basic composition is a combination of muscovite-biotite-oligoclase-quartz schist. This Member is best recognized by the large single crystals of pinkish-white plagioclase which commonly average one-half inch in diameter.

The Fly Pond Member is light-to-medium gray in color and is best characterized by its thinly layered uniformly medium grained crystals. Common minerals comprising this Member are epidote-biotite-hornblende-quartz-analepine gneiss.

Surficial Geology

The surficial materials distinguished on this site are sand and gravel, till, and river alluvium. The glacial history of the site played a large role in developing the types of surficial formations found on the site. Sand and gravel deposits are generally found to the south and west of Wright Pond. The sand and gravel area terminates at the outflow of Wright Pond where two high ridges to the north and south meet and form a steep "v" shaped valley. This valley was probably blocked by glacial ice, allowing a lake to form and materials traveling downstream to settle out.

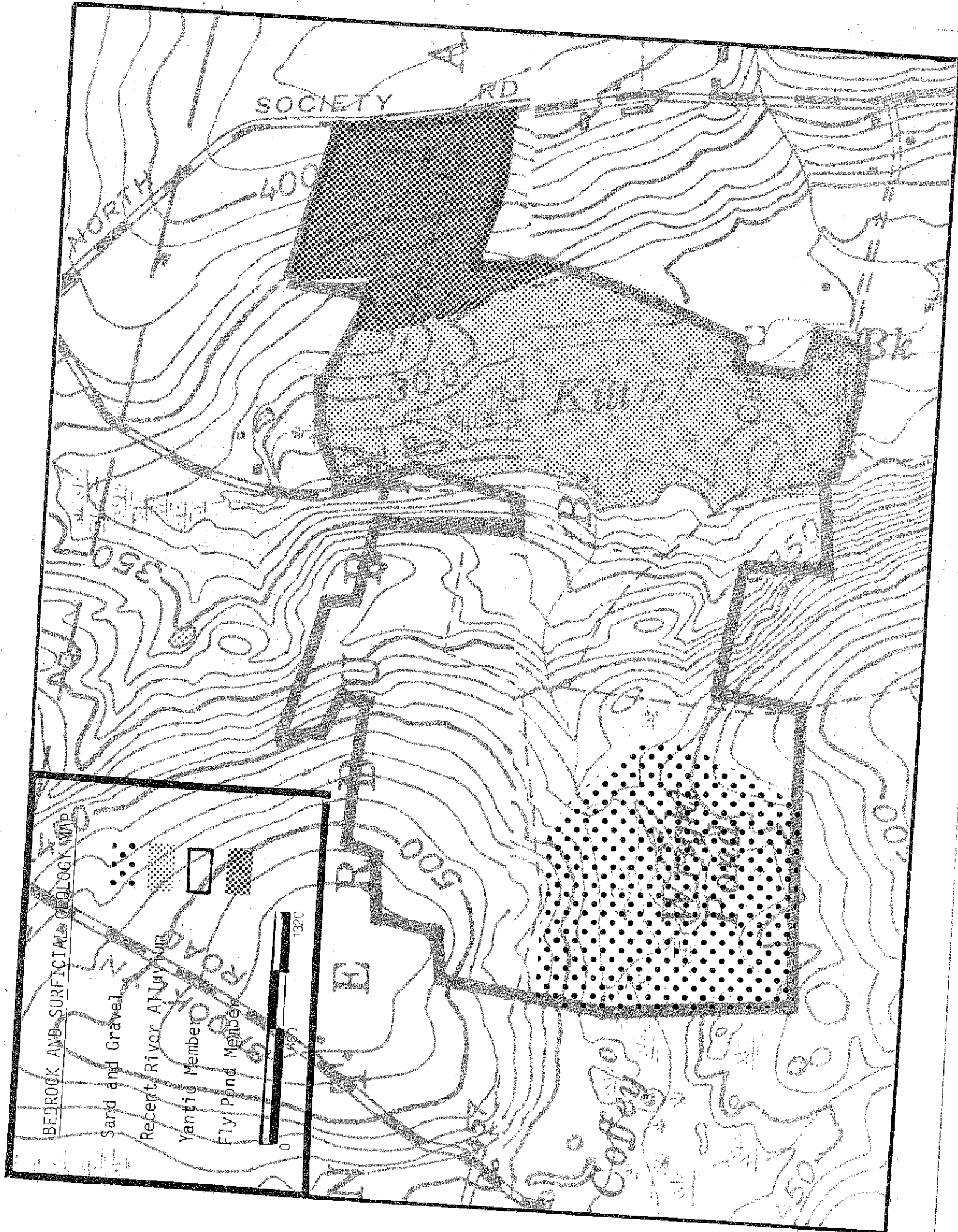
A second type of sand and gravel deposit found on the site is termed recent river alluvium. This material is similar to the glacial sand and gravels, but it has been deposited by the recent action of Kitt Brook not by direct glacial activity. Neither of these sand and gravel deposits have any mining potential as they are located in high ground water areas.

The remaining portions of the site are covered with a glacial material termed "till." Unlike the sand and gravel deposits which were formed by the action of moving water, till is a product of ice action. As the glaciers advanced southward, they bulldozed, crushed and picked up the bedrock material they encountered. In their retreat, they left behind this mixture of crushed material as a surface skin over the bedrock.

Hydrology

The site is contained in a total drainage area of three square miles. The actual site contains the confluence of two brooks, Coffey Brook and Kitt Brook. The average lowflow on an annual basis is one cubic foot per second (CFS). The two-year average maximum flow is approximately 145 CFS. The hundred year flood flow is approximately 670 CFS.

Preliminary indications show that the sand and gravel deposits along Kitt and Coffey Brooks may hold some potential for small municipal water supplies. Unfortunately, not enough information data exists for this area for accurate estimates.



BEDROCK AND SURFICIAL GEOLOGIC MAP

Sand and Gravel

Recent River Alluvium

Yantic Member

Fly Pond Member



