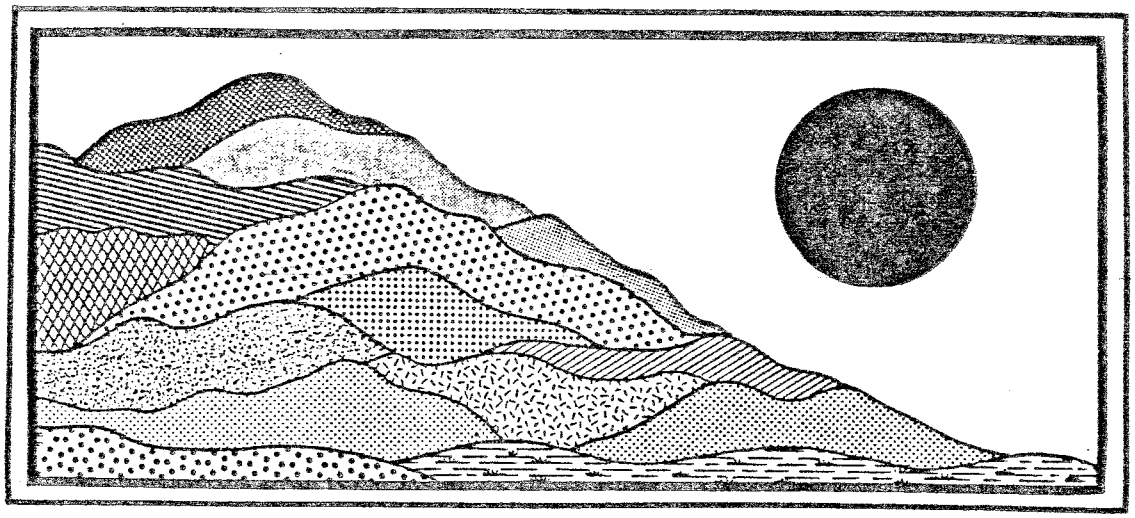
TOWN LAND

LISBON, CONNECTICUT

August 1987



ENVIRONMENTAL REVIEW TEAM REPORT

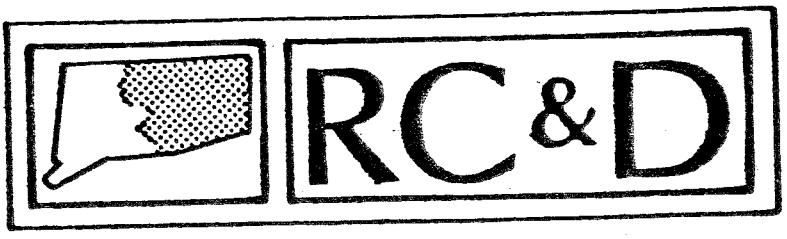
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

TOWN LAND

LISBON, CONNECTICUT

Review Date: APRIL 28, 1987

Report Date: AUGUST 1987

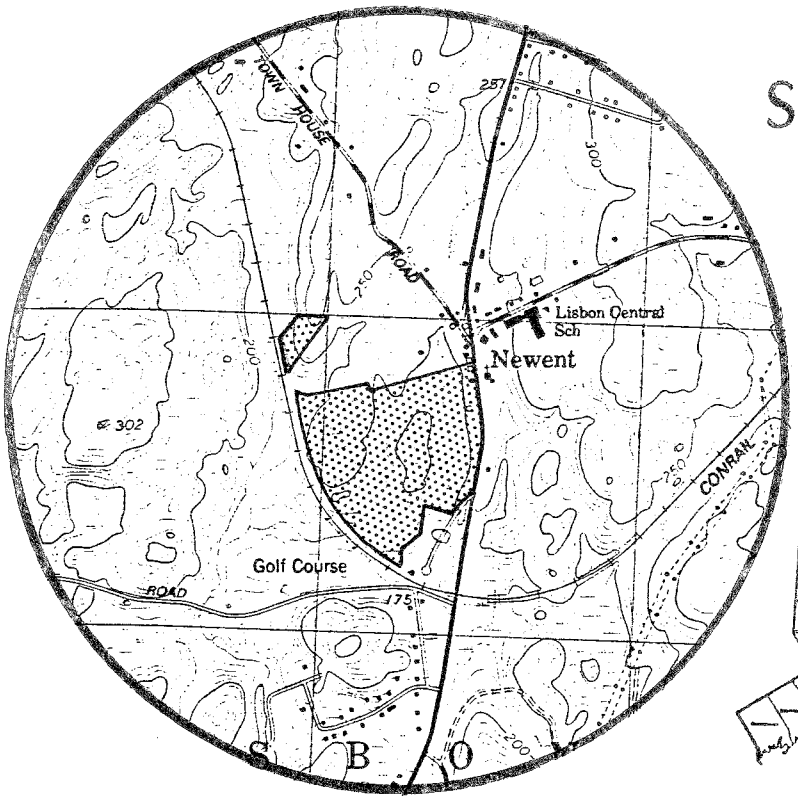


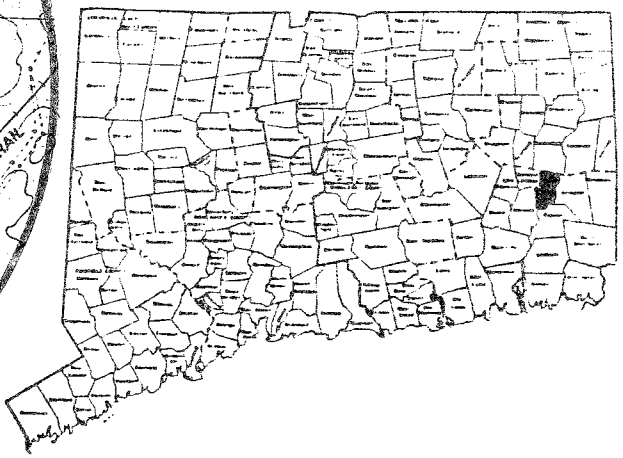
ENVIRONMENTAL REVIEW TEAM
PO BOX 198
BROOKLYN, CONNECTICUT 06234

Site Location

TOWN LAND

LISBON, CONNECTICUT





EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

Granby
Suffield
Enfield
Somers
Stafford
Union
Woodstock
Thompson
East Granby
Windsor Locks
Ellington
Putnam
Simsbury
Windsor
East Windsor
Tolland
Willington
Ashford
Eastford
Pomfret
Canton
South Windsor
Vernon
Killingly
Bloomfield
Chaplin
Avon
West Hartford
Hartford
East Hartford
Manchester
Bolton
Coventry
Mansfield
Hampton
Brooklyn
Farmington
Andover
Windham
Scotland
Canterbury
Plainfield
Sterling
Newington
Wethersfield
Glastonbury
Hebron
Columbia
Rocky-hill
Mari-borough
Lebanon
Sprague
Voluntown
Cromwell
Portland
Franklin
Lisbon
Griswold
East Hampton
Colchester
Middletown
Bozrah
Norwich
Preston
Middlefield
Durham
Haddam
East Haddam
Salem
Montville
North Stonington
Ledyard
Chester
Lyme
Waterford
Killing-worth
Deep River
East Lyme
Stonington
Groton
Essex
Old Lyme
New London
Clinton
West-brook
Old Saybrook

ENVIRONMENTAL REVIEW TEAM REPORT

ON

TOWN LAND

LISBON, CONNECTICUT

This report is an outgrowth of a request from the Lisbon First Selectman 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) Area Executive Committee for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Team (ERT).

The ERT met and field checked the site on Tuesday, April 28, 1987. Team members participating on this review included:

Joe Hickey	--State Park Planner DEP, Parks and Recreation
Steve Hill	--Wildlife Biologist DEP, Eastern District Headquarters
Pete Merrill	--Forester DEP, Patchaug State Forest
Brian Murphy	--Fisheries Biologist DEP, Eastern District Headquarters
Elizabeth Rogers	--Soil Conservationist U.S.D.A., Soil Conservation Service
Elaine Sych	--ERT Coordinator Eastern CT RC&D Area
Bill Warzecha	--Geologist DEP, Natural Resources Center

Prior to the review day, each team member received a summary of the proposed project, a list of the Town's concerns, a location map, topographic map, a lot location map and a soils map. The Team met with, and were accompanied by a member of the Town Land Study Committee. Following the review, reports from each team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project -- all final decisions and conclusions rest with the Town and landowner. 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. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Executive Committee hopes you will find this report of value and assistance in making your decisions on this piece of Town owned land.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P. O. Box 198
Brooklyn, CT 198
(203) 774-1253

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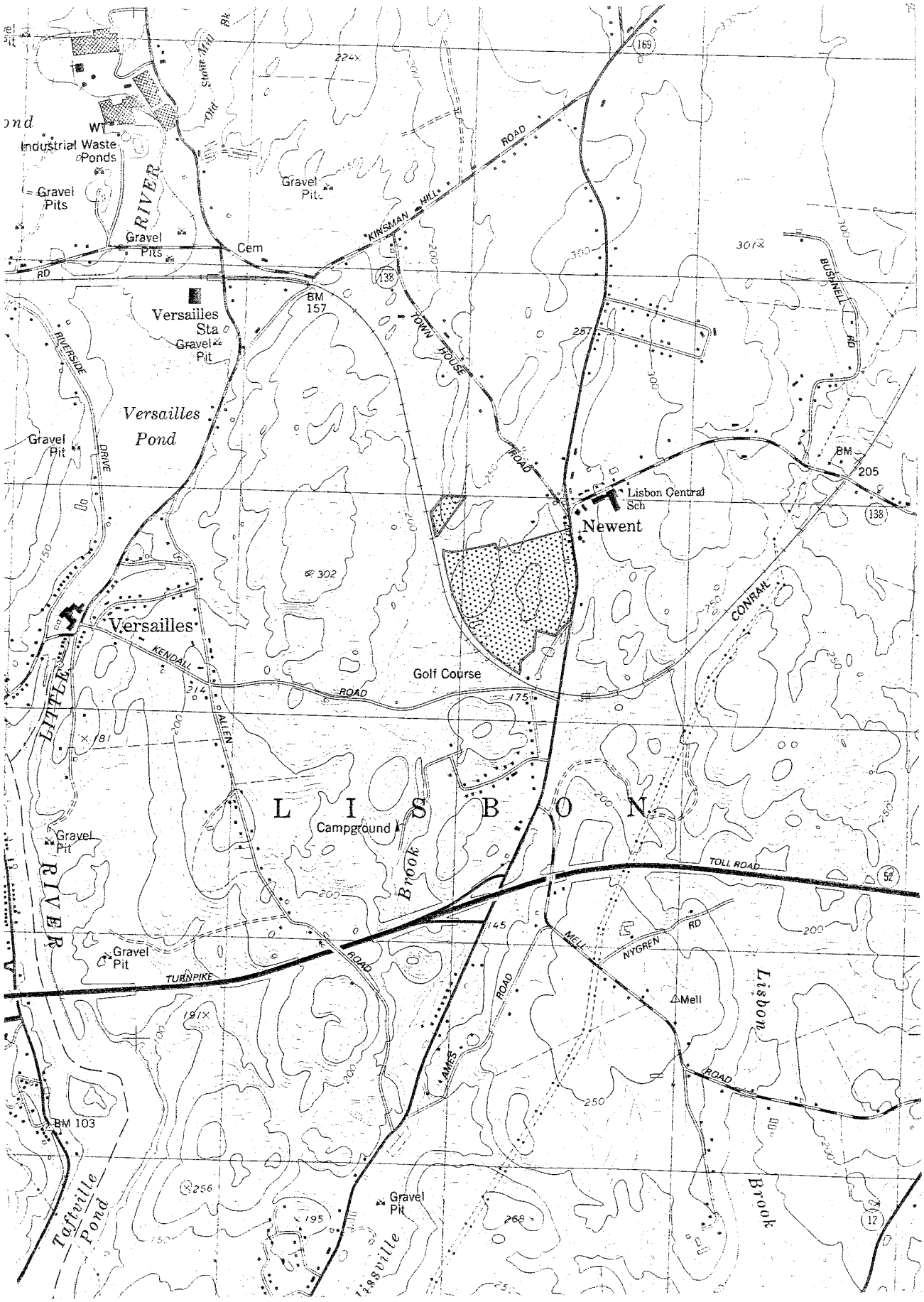
LOCATION

Scale 1" = 2000'



A. INTRODUCTION

The Eastern Connecticut Environmental Review Team has been asked by the Town of Lisbon to provide natural resource information for property recently purchased by the Town. The larger piece is ±59 acres in size, and a second interior piece is approximately ±4 acres.

The Town has the intention of developing this property for the use of all Lisbon residents. Information provided in this report will aid them in determining what use(s) should be made of this land. Comments, concerns and recommendations in this report reflect the many ideas presented to the Team. The Town is considering future expansion of education facilities, skating pond, a track, ballfields, nature trail, picnic areas and a community center.

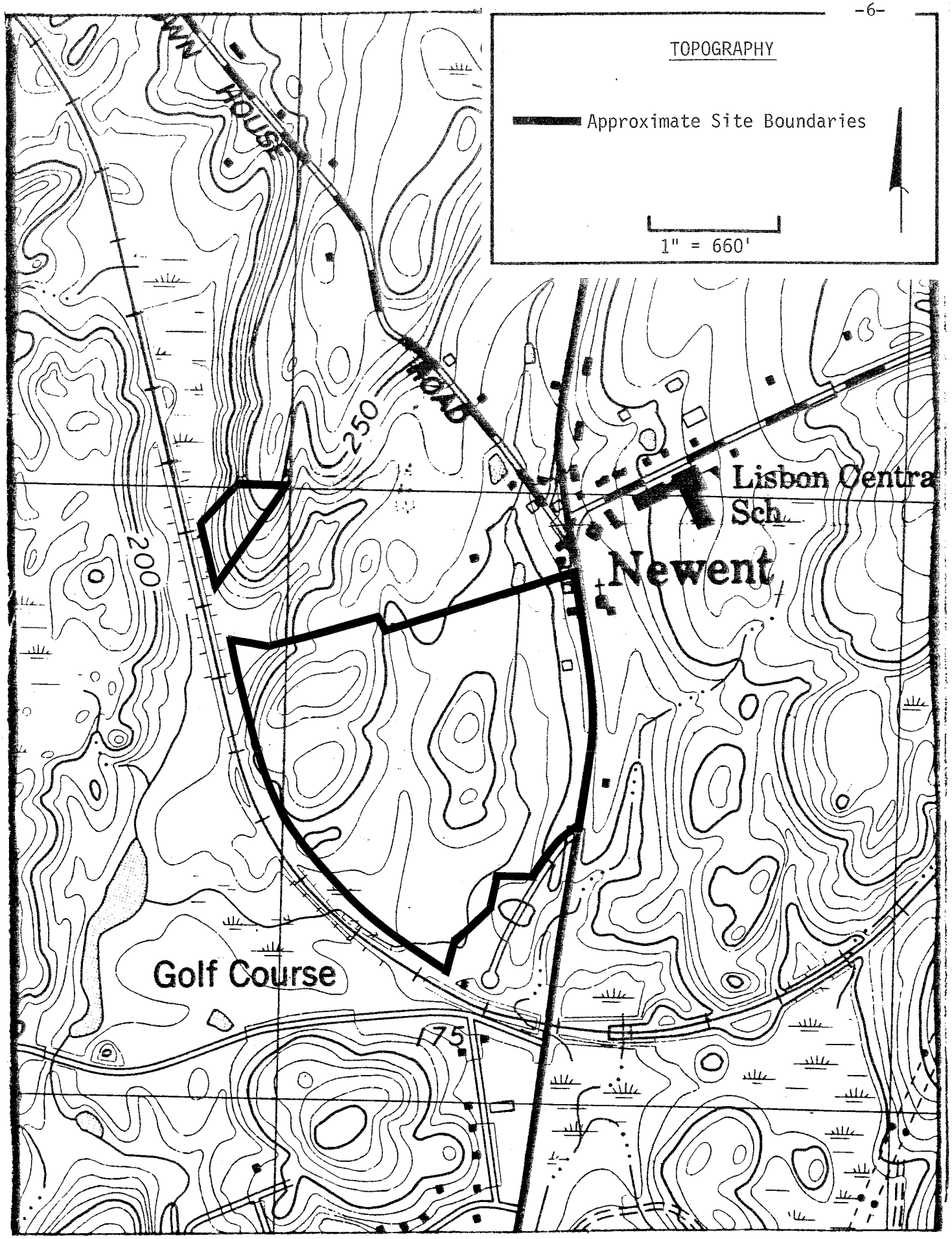
B. SETTING AND TOPOGRAPHY

The subject parcels are located southwest of the Newent section of Lisbon on land formerly known as the Whittaker Property. Its total acreage is 63 acres, all of which lies on the westside of route 169.

The site has a past agricultural history. The eastern and southern part contain open fields, while the western and central part are mostly wooded.

Generally speaking, shallow to bedrock conditions characterize the site. Bedrock exposures are visible in the eastern part along Route 169 and in the hillier sections of the site. The presence of bedrock-controlled topography has resulted in moderate to steep slopes. Steepest slopes are found in the western part, especially on the 4-acre detached parcel.

The major streamcourse on the site which is located in the eastern part is Lawrence Brook. It flows in a southerly direction through the site, but makes a 90° turn to the west at the southern limits. Another south flowing stream tributary to Lawrence Brook is present in the central portion. Both ultimately empty into Shetucket River to the south.


TOPOGRAPHY
Approximate Site Boundaries
1" = 660'
INN HOUSE
ROAD
250
200
175
Lisbon Central Sch.
Newent
Golf Course

C. GEOLOGY

The properties are located within the Norwich topographic quadrangle. The U. S. Geological Survey has published a bedrock geologic map (Map GQ-144, by G. L. Snyder) and a surficial geologic map (Map GQ-165, by P. Hanshaw and G. Snyder) for the quadrangle.

As mentioned earlier, bedrock is at or near ground surface throughout most of the site. Snyder indentifies the bedrock underlying the site as two subunits of Putnam gneiss. The most widespread has been described as a medium-grained gneiss composed of the minerals andesine, quartz, and biotite with minor amounts of potassium feldspar, iron-oxide minerals and muscovite. Within this rock unit are three small areas of another subunit of Putnam gneiss called amphibolites. It is described as a medium grained granofels composed of a high percentage of the amhibole mineral hornblende. The rock also includes the minerals labradorite, biotite, quartz, scapolite and pyroxene.

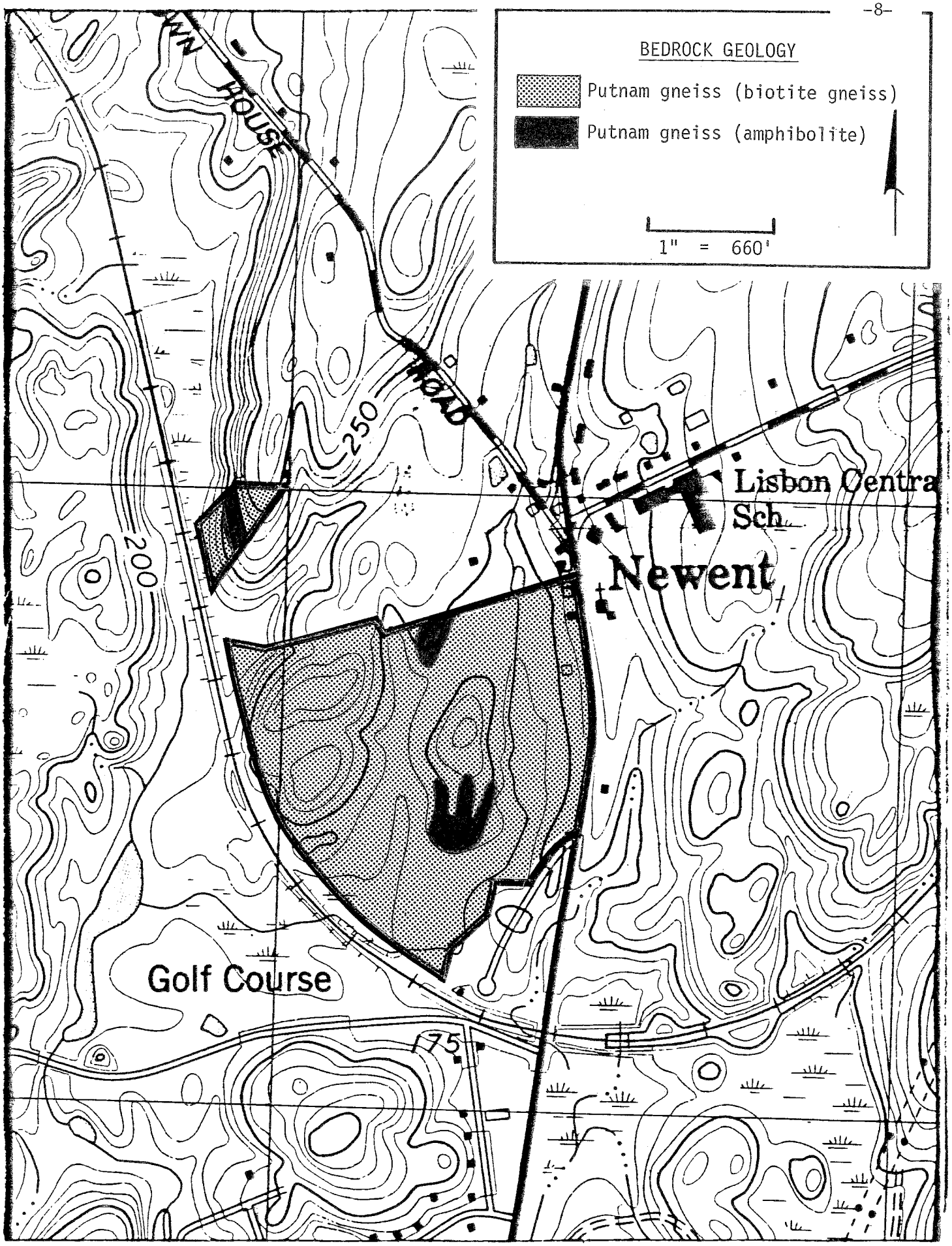
The term "gneiss" refers to metamorphic rock (rock altered by heat and pressure) which contains dark, platy or flaky minerals that alternate within thin layers of more rounded minerals, which are light colored. This mineral arrangement gives the rock a banded appearance. "Granofels", like gneisses are also metamorphic rocks, but differ mainly because they lack the compositional banding which characterizes the gneisses.

Because the rock surface is relatively shallow throughout most of the site and because the rock is quite competent, there may be a need to blast for the construction of foundations, roads, etc.

Many homes in the area rely on the underlying bedrock as a source of drinking water. If an on-site water supply is desired for the parcel, the underlying bedrock will undoubtedly be the best source of water to well(s). The presence of some iron-bearing minerals, i.e., iron oxides in the bedrock on the site may elevate iron and manganese levels to a point which may require filtration.

Except for the low-lying areas in the central and eastern part, the site is covered mainly by thin layer of glacial till. As glacier ice moved through the region, it collected and transported rock particles and pre-existing overburden.

Much of this transported debris was redesposited directly from the ice, either by being plastered onto the land from beneath the ice mass or by being let down gently as the ice wasted away. The resulting deposit was till. Because of its mode of deposition, till contains a nonsorted mixture of


BEDROCK GEOLOGY
Putnam gneiss (biotite gneiss)
Putnam gneiss (amphibolite)
1" = 660'
ROUTE
ROAD
250
200
175
Lisbon Centra
Sch
Newent
Golf Course

particles ranging in size from clay to large boulders. The till may be sandy, stony and loose, or silty, less stony and tightly compact. The till on the site is comprised of the sandy, stony and loose variety.

When the glacier ice began to melt, it sent forth streams of meltwater, often with torrential flows. These streams were filled with rock debris from the ice, and they redeposited this debris in well-sorted to poorly sorted layers. Sand and gravel were commonly deposited near the ice, while silt and clay were washed further downstream to be deposited in lakes or in the sea. The resulting deposits are known as stratified drift.

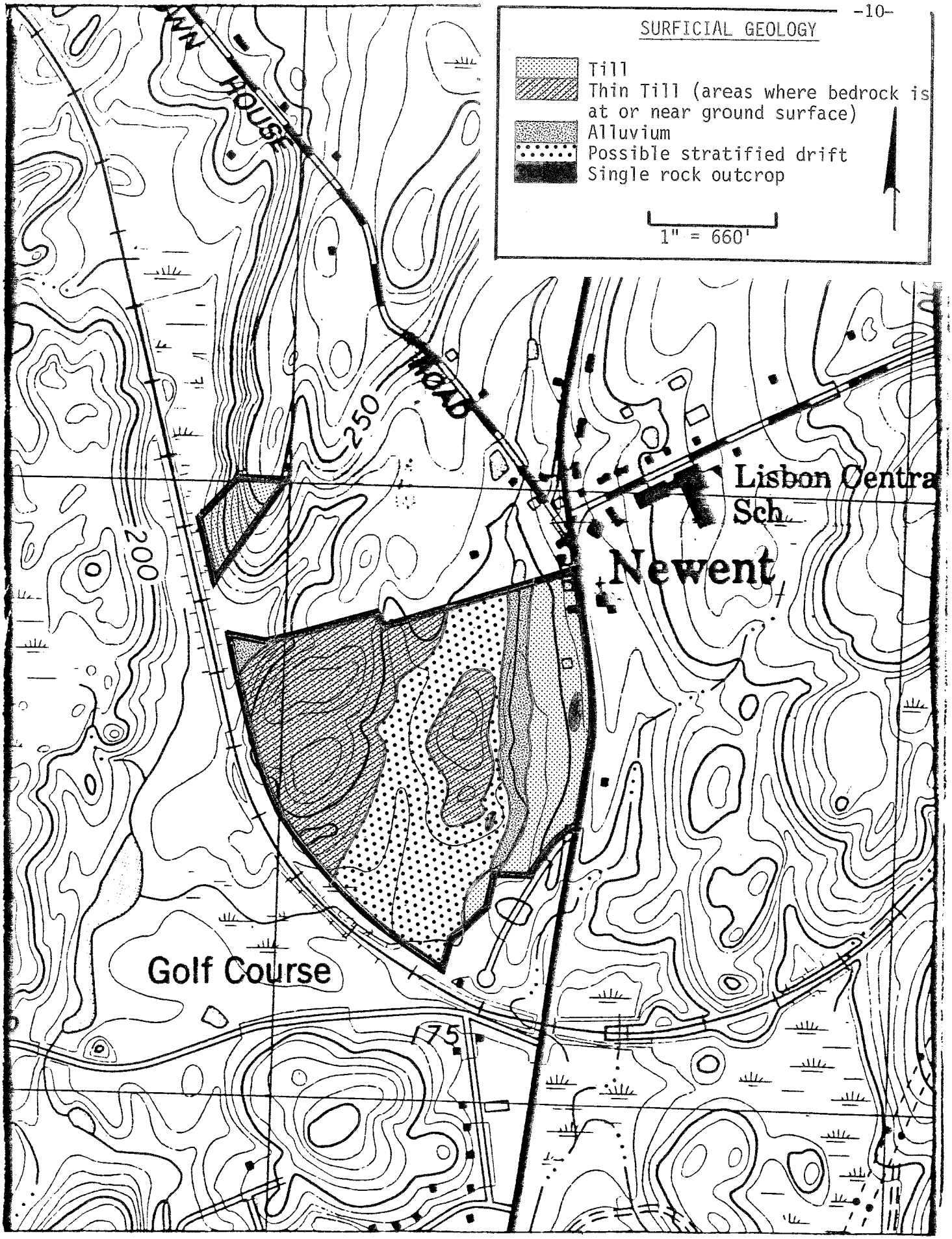
Based on the Map GQ-165, stratified drift covers the stream valleys in the central and eastern part of the property. It should be pointed out that the Soil Survey for New London County does not indicate soils derived from stratified drift deposits on the site. Detailed soil testing would need to be conducted on the site to determine whether stratified drift is present or not. Thicknesses of the stratified drift probably ranges from zero where bedrock outcrops to probably not much more than ten feet.

Finally two post-glacially deposited sediments can be found on the parcel: alluvium and swamp deposits.

Alluvium, is a more recent surficial geologic deposit consisting of sand, silt and gravel. On-site, it occurs as a thin cover along the unnamed streamcourse in the eastern part.

Overlying the sandy, gravelly soils in the central parts of the property are seasonally wet areas. These areas are delineated by the symbol Rn (Ridgebury, Leicester and Whitman soils) on the Soils Map accompanying this report. These soils as well as the soils comprising the alluvium deposits are regulated inland-wetland soils.

Inland wetland areas perform important positive hydrological functions such as: (1) serving as a flood and stormwater retention area, which reduces downstream flood flows during periods of heavy precipitation; (2) improving surface water quality through various biochemical processes; and (3) trapping sediments from upstream areas. From an ecological standpoint, they provide habitats for a wide diversity of plant and animal species. Wetlands can be used as valuable resource areas for educational purposes, passive recreational uses and scientific research. In preparing plans for the future use of this property, consideration should be given to protecting the character and functions of these wetland areas.


SURFICIAL GEOLOGY
Till
Thin Till (areas where bedrock is at or near ground surface)
Alluvium
Possible stratified drift
Single rock outcrop
1" = 660'
INN HOUSE
ROAD
250
200
175
Lisbon Central Sch.
Newent
Golf Course

D. SOILS

The Town is interested in using the property for the possible construction of a new school as well as for recreational and wildlife purposes. Some of the soils at the site have limitations for development. These limitations include wetness, shallowness to bedrock and steepness of slope. Refer to the limitation charts for information on specific soils.

The Town contacted the Soil Conservation Service for assistance in determining the feasibility of constructing a pond at the site. The Soil Conservation service, which works through the New London County Soil and Water Conservation District, has provided assistance to the Town by surveying and designing a skating pond.

United States Department of Agriculture

Soil Conservation Service

New London County USDA-SCS
562 New London Turnpike
Norwich, CT 06360
887-4163

Scale 1" = 1320' Soil Survey Sheets #11, #20

Principal Limitations and Ratings
for Building Site Development

Soil name and map symbol	Dwellings without basement	Dwellings with basement	Lawns and landscaping	Septic tank absorption fields
#CbB-Canton	Slight	Slight	Slight	Slight
Charlton	Slight	Slight	Slight	Slight
*Ce-Carlisle	Severe-ponding, low strength	Severe-ponding, low strength	Severe-ponding, excess humus	Severe-ponding
CrC-Charlton	Moderate-slope	Moderate-slope	Moderate-slope, large stones	Moderate-slope
Hollis	Severe-depth to rock	Severe-depth to rock	Severe-thin layer	Severe-depth to rock
HrC-Hollis	Severe-depth to rock	Severe-depth to rock	Severe-thin layer	Severe-depth to rock
Charlton	Moderate-slope	Moderate-slope	Moderate-slope, large stones	Moderate-slope
Rock Outcrop				
HrD-Hollis	Severe-slope, depth to rock	Severe-slope, depth to rock	Severe-slope, thin layer	Severe-slope, depth to rock
Charlton	Severe-slope	Severe-slope	Severe-slope	Severe-slope
Rock Outcrop				
*Rn-Ridgebury	Severe-wetness	Severe-wetness	Severe-setness	Severe-percs slowly,wetness
Leicester	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness
Whitman	Severe-ponding	Severe-ponding	Severe-ponding	Severe-percs slowly,ponding
#SvA-Sutton	Moderate-wetness	Severe-wetness	Moderate-wetness	Severe-wetness
#SvB-Sutton	Moderate-wetness	Severe-wetness	Moderate-wetness	Severe-wetness
SxB-Sutton	Moderate-wetness	Severe-wetness	Moderate-wetness,large stones	Severe-wetness

*Designated inland wetland soil by Public Act 155
#Prime farmland soil

Principal Limitations and Ratings of Soils for Recreational Development

Soil name and map symbol	Picnic areas	Playgrounds	Paths and trails
#CbB-Canton	Slight	Moderate-slope, small stones	Slight
Charlton	Slight	Moderate-slope, small stones	Slight
*Ce-Carlisle	Severe-ponding, excess humus	Severe-ponding, excess humus	Severe-ponding, excess humus
CrC-Charlton	Moderate-slope, large stones	Severe-slope, large stones	Slight
Hollis	Severe-depth to rock	Severe-slope, depth to rock, large stones	Slight
HrC-Hollis	Severe-depth to rock	Severe-slope, depth to rock large stones	Slight
Charlton	Moderate-slope, large stones	Severe-slope, large stones	Slight
Rock Outcrop			
HrD-Hollis	Severe-slope, depth to rock	Severe-slope, depth to rock, large stones	Moderate-slope
Charlton	Severe-slope	Severe-slope, large stones	Moderate-slope
Rock Outcrop			
*Rn-Ridgebury	Severe-large stones, wetness	Severe-wetness, large stones	Severe-wetness
Leicester	Severe-large stones, wetness	Severe-wetness, large stones	Severe-wetness
Whitman	Severe-large stones, ponding	Severe-ponding, large stones	Severe-ponding
#SvA-Sutton	Moderate-wetness	Moderate-wetness, small stones	Moderate-wetness
#SvB-Sutton	Moderate-wetness	Moderate-slope, wetness, small stones	Moderate-wetness
SxB-Sutton	Severe-large stones	Severe-large stones	Moderate-wetness

*Designated inland wetland soil by Public Act 155
#Prime farmland soil

Principal Limitations and Ratings
as Wildlife Habitat

Soil name and map symbol	Openland Wildlife	Woodland Wildlife	Wetland Wildlife
#CbB-Canton	Good	Good	Very Poor
Charlton	Good	Good	Very Poor
*Ce-Carlisle	Very Poor	Poor	Good
CrC-Charlton	Poor	Good	Very Poor
Hollis	Poor	Poor	Very Poor
HrC-Hollis	Poor	Poor	Very Poor
Charlton	Poor	Good	Very Poor
Rock Outcrop			
HrD-Hollis	Poor	Poor	Very Poor
Charlton	Poor	Good	Very Poor
Rock Outcrop			
*Rn-Ridgebury	Poor	Fair	Fair
Leicester	Poor	Fair	Fair
Whitman	Very Poor	Poor	Fair
#SvA-Sutton	Good	Good	Poor
#SvB-Sutton	Good	Good	Very Poor
SxB-Sutton	Poor	Fair	Very Poor

*Designated inland wetland soil by Public Act 155
#Prime farmland soil

CbB-Canton and Charlton fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on glacial till upland hills, plains, and ridges. Areas of this unit consist of either Canton soil or Charlton soil, or both. These soils were mapped together because there are no major differences in use and management. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is medium. This soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium. The soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

These soils are well suited to cultivated crops. These soils are in capability subclass IIe.

Ce-Carlisle muck

This nearly level, very poorly drained soil is in pockets and depressions of flood plains, stream terraces, outwash plains, and glacial till uplands. Slopes range from 0 to 2 percent. The Carlisle soil has a high water table near or above the surface for most of the year. Permeability is moderately rapid. The available water capacity is high. Runoff is very slow. The soil is strongly acid through slightly acid. This soil is not suited to cultivated crops because of wetness. This soil is in capability subclass VIw.

CrC-Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes

This gently sloping to sloping complex consists of somewhat excessively drained and well drained soils on glacial till uplands. Rock outcrops cover up to 10 percent of the surface. Stones and boulders cover 1 to 8 percent of the surface. The soils of this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used. Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium or rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is medium or rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stoniness and rock outcrops generally make the use of farming equipment impractical. The Hollis soil has a shallow rooting depth and is droughtly. The hazard of erosion is moderate to severe. These soils are in capability subclass VIs.

HrC-Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes

This gently sloping to sloping complex consists of somewhat excessively drained and well drained soils and Rock outcrop on glacial till uplands. Stones and boulders cover 1 to 8 percent of the surface. The soils and Rock outcrop in this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is medium or rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium or rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stoniness and the Rock outcrop make the use of farming equipment impractical. The hazard of erosion is moderate to severe. These soils are in capability subclass VIIs

HrD-Hollis-Charlton-Rock outcrop complex, 15 to 45 percent slopes

This moderately steep to very steep complex consists of somewhat excessively drained and well drained soils and Rock outcrop on galcial till uplands. Stones and boulders cover 1 to 8 percent of the surface. These soils and Rock outcrop in this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is rapid or very rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is rapid or very rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

These soils in this complex are not suited to cultivated crops.

Stoniness and the Rock outcrop make the use of farming equipment impractical. The hazard of erosion is severe. These soils in this complex are in capability subclass VIIs.

Rn-Ridgebury, Leicester, and Whitman extremely stony fine sandy loams

These nearly level, poorly drained and very poorly drained soils are in drainageways and depressions of glacial till upland hills, ridges, plains, and drumloidal landforms. Stones and boulders cover 8 to 25 percent of the surface. These soils were mapped together because there are no major differences in use and management. The Ridgebury soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow or slow. Ridgebury soil warms up and dries out slowly in the spring. It is strongly acid through slightly acid.

The Leicester soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is very slow or slow. Leicester soil warms up and dries out slowly in the spring. It is very strongly acid through medium acid.

The Whitman soil has a high water table at or near the surface for most of the year. Permeability is moderate or moderately rapid in the surfacelayer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow, or the soil is ponded. Whitman soil warms up and dries out very slowly. It is very strongly acid through slightly acid.

These soils are not suited to cultivated crops. Stoniness makes the use of farming equipment impractical. These soils are in capability subclass VIIs.

SvA-Sutton fine sandy loam, 0 to 3 percent slope

This nearly level, moderately well drained soil is on upland glacial till plains, hills, and ridges. The Sutton soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. Runoff is slow. Sutton soil warms up and dries out slowly in the spring. Unless limed, it is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is well suited to cultivated crops. The major limiting factor for community development is the seasonal high water table. Onsite septic systems need special design and installation to prevent effluent from seeping to the surface. Foundation drains help to prevent wet basements. Lawns are wet and soggy in Fall and Spring. This soil is in capability subclass 11W.

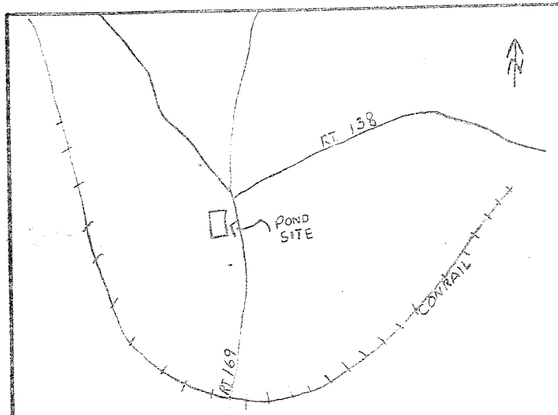
SvB-Sutton fine sandy loam, 3 to 8 percent slopes

This gently sloping, moderately well drained soil is on upland glacial till plains, hills, and ridges. The Sutton soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium. Sutton soil warms up and dries out slowly in the spring. Unless limed, it is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is well suited to cultivated crops. This soil is in capability subclass IIw.

SxB-Sutton extremely stony fine sandy loam, 0 to 8 percent slopes

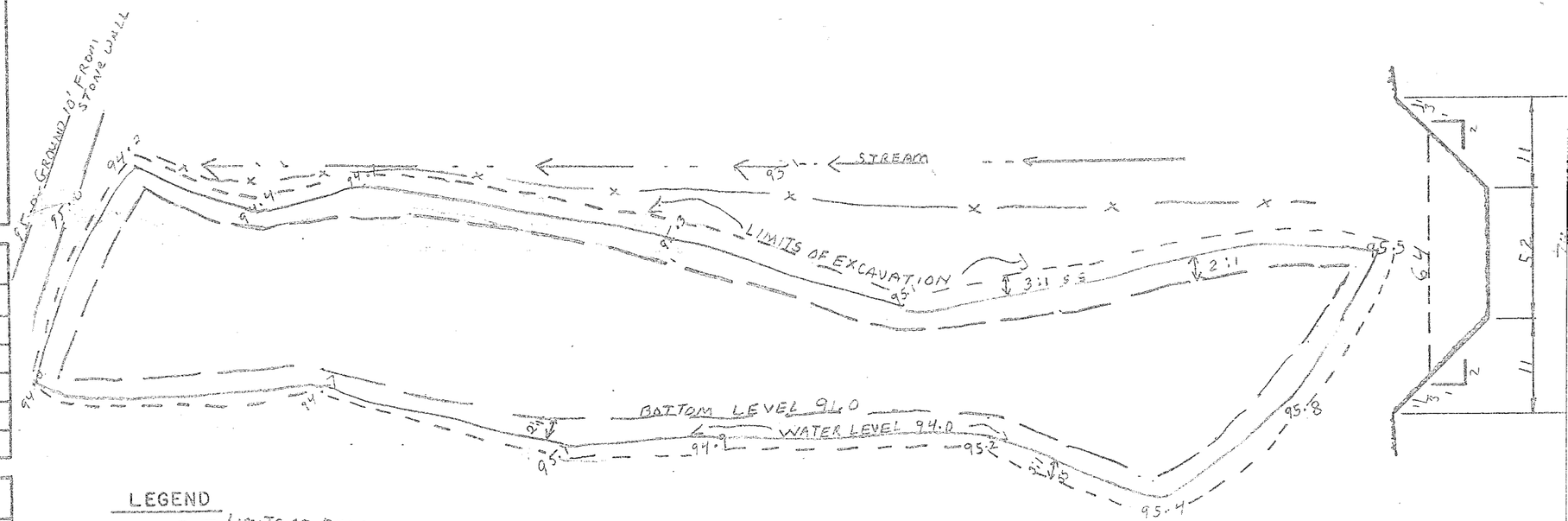
This nearly level to gently sloping, moderately well drained soil is on upland glacial till plains, hills, and ridges. Stones and boulders cover 8 to 25 percent of the surface. The Sutton soil has a seasonally high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is slow or medium. Sutton soil warms up and dries out slowly in the spring. It is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is not suited to cultivated crops because stoniness makes the use of farming equipment impractical. This soil is capability subclass VIIs.

S.S. SHEET NO. 20
AERIAL PHOTO 34-75-5620
QUADRANGLE NORWICH



LOCATION SKETCH

SCALE IN FEET 1:2400'



LEGEND
- LIMITS OF EXCAVATION
- WATER LEVEL
- BOTTOM LEVEL
- HAYBALES

PLAN VIEW

SCALE 1" = 40'

ESTIMATED QUANTITIES

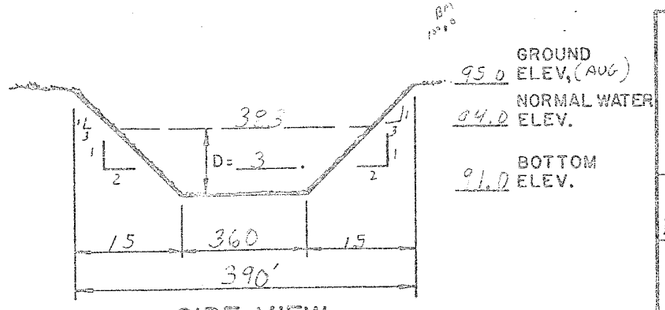
ITEM	UNIT	QUAN.
EXCAVATED MATERIAL	CU/YDS	3,500

SEEDING: _____ ACRES

MATERIALS	RATE	LBS.
SEED - SEE ENCLOSED PLANTING GUIDE	POND AREA	
FERTILIZER		
LIME		
MULCH		
SEEDING PERIOD.		

NOTES:

1. FENCING - THE POND, SPOIL MATERIAL, INLET AND OUTLET SHALL BE FENCED IF NECESSARY TO PROTECT THE VEGETATION OR FOR SAFETY.
2. EXCAVATED MATERIALS WILL BE REMOVED FROM WETLAND AREA. LAND OWNER MUST OBTAIN ALL NECESSARY PERMITS BEFORE CONSTRUCTION.
3. POND SURFACE AREA 2 ACRES



SIDE VIEW

SOIL TYPE: RN - RIDGEBURY
CAPACITY (FULL) 2.17 AC. FT 530,145
SOURCE OF WATER GROUND WATER
ENGINEERING JOB CLASS I

EXCAVATED POND

LISBON RECREATION c/o FELIX PROKOP
57 BUNDY HILL ROAD
LISBON CT 06351

SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

	DATE		
DESIGNED BY	Eu	2/14/97	APPROVED BY M. Martinez
CHECKED BY			DRAWING NO. CT-NL-97-
CONSTR. CK.			SHEET NO. 1 OF 1

CT-RI-ENG. - 6 (FE

E. HYDROLOGY

Both parcels of land lie within the Blissville Brook watershed. Blissville Brook ultimately flows into the Shetucket River. At its point of confluence with the Shetucket River, Blissville Brook drains an area of 4.09 square miles or 2,618 acres. Surface runoff on most of the site drains to streamcourses in the central and eastern part. Surface runoff from the western limits of the site and the 4-acre parcel flows into a wetland area along the east side of the railroad track. From this point, it is routed under the railroad track and transported to the stream that flows into the north end of the pond at Lisbon Golf Course. The underlying bedrock surface largely controls the drainage on the site.

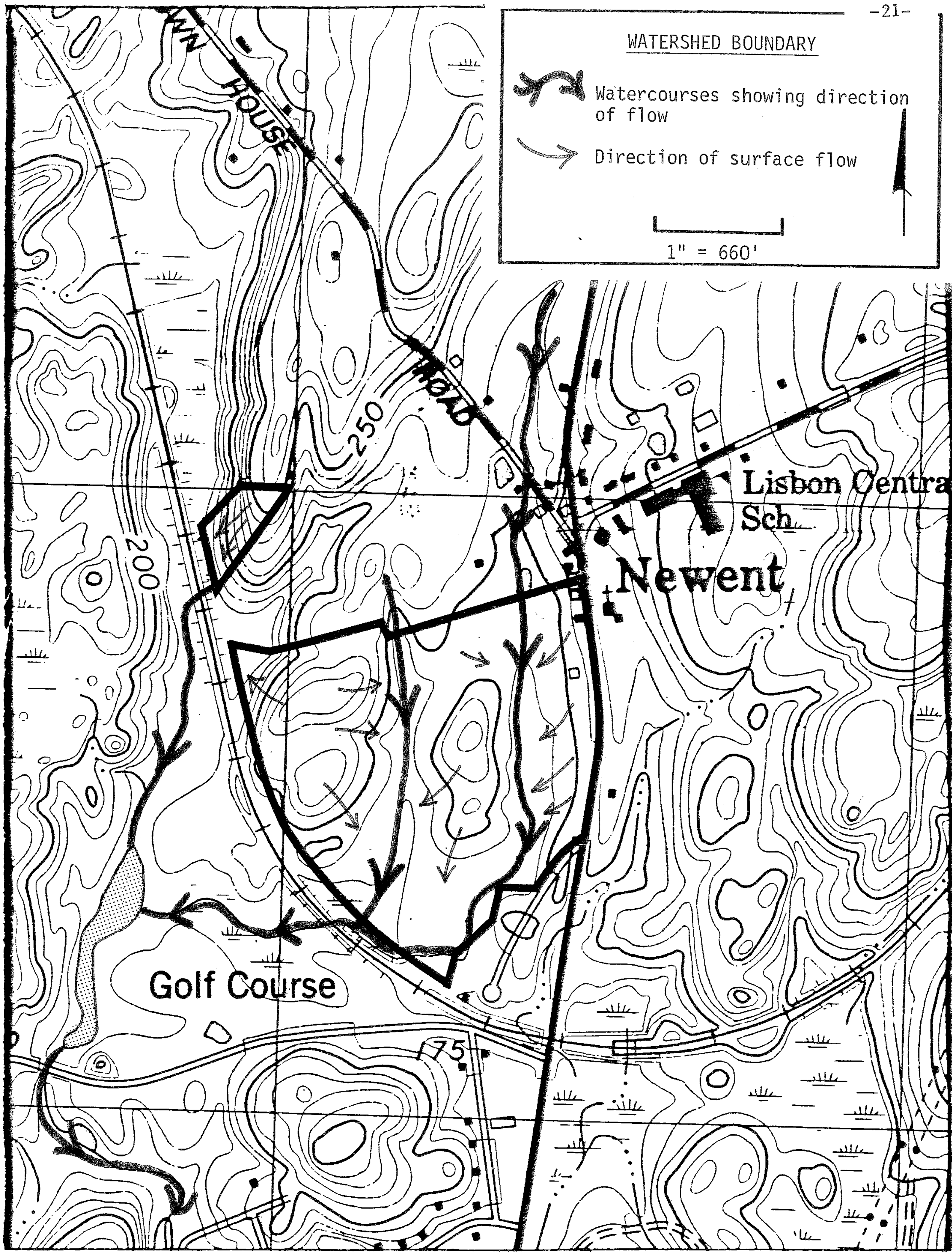
Groundwater within the site and area is classified by the Department of Environmental Protection as GA, which means that it is suitable for private drinking water supplies without treatment. The surface waters within the site are also classified as A, which means that it is of a generally good; (1) water quality (potential dringing water supply); (2) fish and wildlife habitat; (3) recreational use; and (4) agricultural, industrial supply and other legitimate uses.

F. GEOLOGIC DEVELOPMENT CONCERNS

Team members were informed on the review day that possible uses of land include expansion for educational facilities and active and passive recreational facilities. Long term uses may include a community center.

In terms of constructing a school and active recreational facilities such as playing fields the principal geologic limitations on the use of the property will be the following; (1) shallow depths to rock on most of the parcel; (2) locally moderate to steep slopes; and (3) permanent and seasonally wet areas. In addition, the till-based soils on the site may also be a limiting factor in terms of building construction. The reason for this is that these soils may have elevated groundwater tables, contain numerous stones, and have slow percolation rates. Since public sewers are not available, potential buildings constructed within the parcel will need to rely on on-site sewage disposal systems. The above mentioned limitations will require special engineering design in order to be surmounted.

Before an accurate assessment of the soils on the site for septic systems can be made, detailed soil testing would be required.


WATERSHED BOUNDARY
Watercourses showing direction of flow
Direction of surface flow
1" = 660'
HOUSE
ROAD
250
200
75
Lisbon Centra
Sch
Newent
Golf Course

Preliminarily, it appears that sandy gravelly soils in the central parts would be desirable for subsurface sewage disposal. Because waste water generated by a potential school building would probably exceed 5,000 gallons/day, the design of the septic system by a professional engineer would be required and the design reviewed by the State Department of Environmental Protection. The shallow to bedrock areas that cover most of the site would more than likely represent a design problem. As a result, these areas have low potential for on-site septic systems. Wetland areas also hold low potential for any type of development and should be avoided where possible.

There may be a possibility that the site could support one or two playing fields but a feasibility study would be required. The presence of moderate to steep slopes and shallow to bedrock conditions would be the major hindrances. Significant cuts and fills along with possible blasting would be required in order to construct playing fields on most of the upland parts of the site. This type of activity, i.e., blasting, filling, etc. would undoubtedly be very costly.

Because of its aesthetic setting and geologic conditions, the site lends itself mainly to passive recreational uses, i.e., hiking, jogging trails, picniking, ice skating, etc.

Every effort should be made to gain access to the 4-acre land-locked price northwest of the site. Depending upon abutting property owners, this might be accomplished by swapping the 4-acre parcel for a piece of land of equal size that adjoins the 59-acre parcel.

G. WATER SUPPLY

If a water supply is needed for the site, it seems likely that the underlying bedrock will need to be tapped as a water supply source. The thickness and questionable presence of stratified drift in the low-lying areas of the site makes the drift unfavorable for large-scale groundwater supply development. The metamorphic rock underlying the site probably has potential for low or possibly moderate yields.

The exact yield of a bedrock-based well is a function of many geologic factors such as the number and size of fractures present in the bedrock. Since fractures in bedrock are irregular, there is no practical way of predicting the yield of a bedrock well drilled in a specific location. Even with geophysical exploration, it is extremely difficult to predict such yields.

As such, the yield of a well tapping crystalline rocks cannot be estimated with any certainty before drilling. According to Water Resources Bulletin No. 15, which includes the subject site, it indicates that most bedrock wells (9 out of 10) are capable of yielding at least 3 gallons per minute. While a yield of 3 gpm would be adequate for most passive and recreational uses, it would probably not be adequate enough for a school water supply. It is probable, however, that the combined yield from a series of wells could satisfy water supply demands.

If a well or wells is drilled to serve a school it would be considered a community water supply. As such, the water system would need to be reviewed and approved by the Water Supply Section of the State Department of Health Services and Department of Public Utilities Control. A certificate of convenience and necessity must be issued jointly by the Department of Health Services and Department of Public Utilities Control. It is recommended that the Town contact the Department of Public Utility Control for an application for the subject certificate, if a community water supply system is needed on the parcel.

As mentioned earlier, natural groundwater quality should be good, although some possibility of elevated iron and manganese levels may exist.

H. VEGETATION

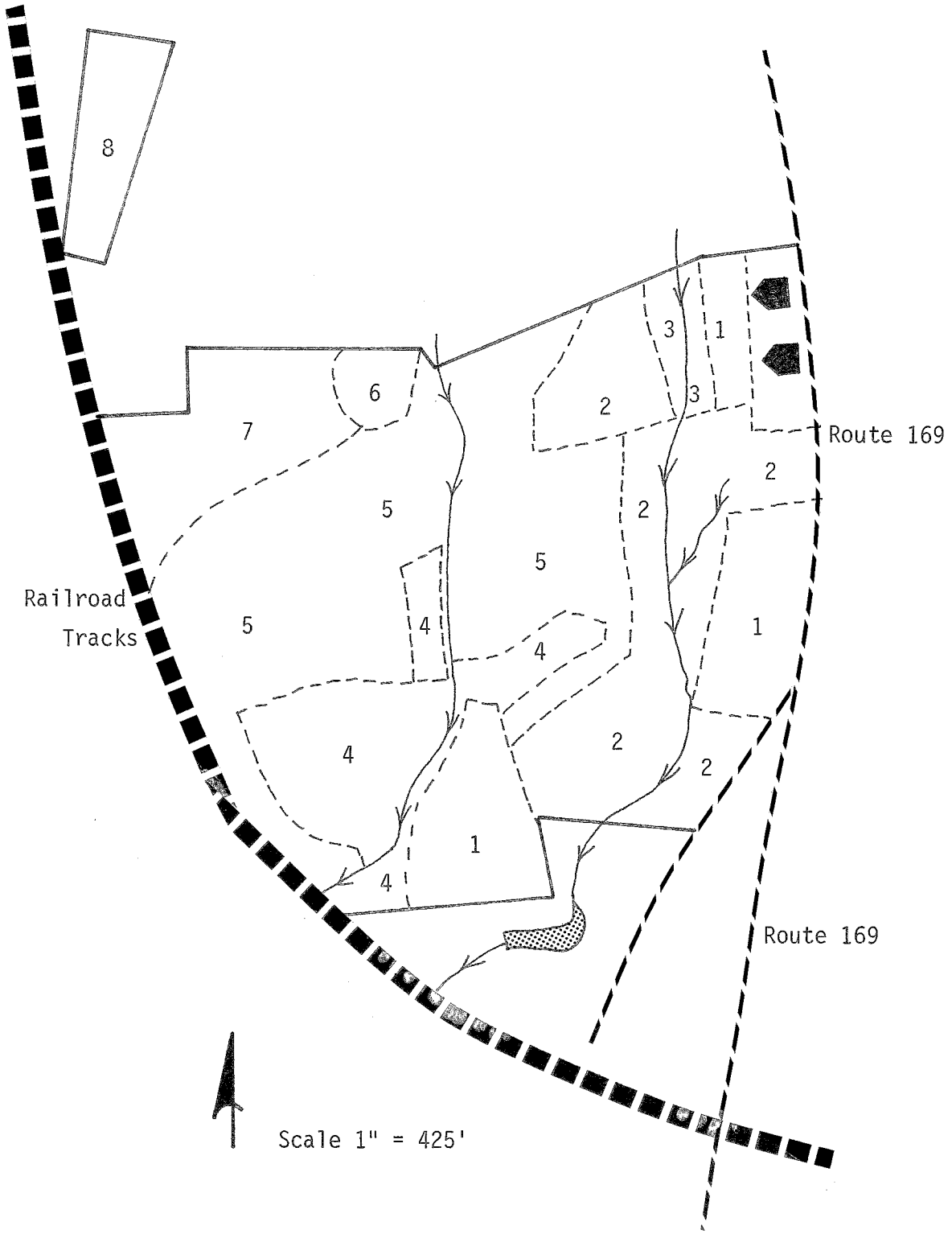
The dominant vegetative features of this parcel are fields, open pastures, and woodland pasture. This gives the impression of a very open area readily accessible for many types of recreation; and as a Town outdoor recreation area it seems to have considerable potential. A skating pond is already planned and there is room for many more facilities.

The present vegetative cover types can be broken down into seven categories (See map).

Area #1 These are hay fields that have been mowed and used for hay production. At present they are all grass with only a little brush encroaching from the hedgerows; however, unless they are mowed and fertilized on a regular basis they will begin to be invaded by brush and small trees in three to five years.

Area #2 Pasture fields: Although these are open fields they were either too rough or too wet for regular hay production. They were used primarily for grazing, with probably one annual mowing just to control weeds and brush. These areas are already showing signs of being invaded by

VEGETATION



trees and brush and without maintenance in five to six years, it can be expected one third (1/3) to one half (1/2) of the area will be occupied by shrubs and trees.

Area #3 Grass swamp: This is the flood plain along the small brook that runs through the area. Although cows did graze into this area, the area is primarily swamp grass with some speckled alder, red maple and blue beech growing in clumps and patches. Without animals to slow down the growth of the hardwood, the area will slowly become a red maple swamp with hummocks of swamp grass in the wettest areas.

Area #4 Pasture land with some tree cover. Years ago this was the same as Area #2 but a few trees invaded and made it past the grazing and occasional mowing. Some of the area may also be the result of cutting out of this woodland, leaving only a few residual trees and then grass filled in the openings.

Area #5 Woodland Pasture: This is different than Area #4 as this was dense woodland until a few years ago when the area was harvested for sawtimber. Following the timber harvest most of the tree tops were removed for firewood. This left a very open "park-like" condition. This was an ideal condition to be invaded by shrubs and brush, but because of the intensive grazing the brush never got started and grass is starting to fill in in some areas. This gives the area a very pleasant and open aspect of a developed recreation park; however, this condition will not last long if grazing is not continued in the area. Manual control of the vegetation will require either extensive mowing or herbicide spraying, or both. Within three years there will be a noticeable increase in the smaller tree cover.

Area #6 Cut over land: This is a small section of the harvested area that was not grazed and for most of the area did not have the tops removed for fuelwood. This is a steep side of the ridge with some exposed ledge on the east exposure. Also notable is a small (less than 1/2 acre) seasonal shallow pond. This might some day be improved as a small wildlife pond.

Although there is some dry fuelwood in the tops from the logging operation, the area is getting pretty badly decayed and with the difficult terrain, the dry fuelwood is hardly a salable product at this time.

Area #7 This is the uncut and ungrazed portion of the main tract. It does include the very top of the ridge as well as the steep back side of the ridge, as it runs down towards the railraod tracks. Most of the tree growth is fairly small with black oak and black birch six to twelve inches in diameter forming the overstory. Most of the understory is black birch seedling and saplings with some red maple and a few hickories.

Area #8 This is the small 4+ acre area that is not contiguous to the main parcel. In the southwesterly corner near the railroad tracks there is some red maple swamp, but most of the area is oak ridge type as the track encompasses a southwest facing slope with a good deal of exposed ledge rock and very shallow soils. Since the parcel is not contiguous to the larger parcel and has no apparent access, it might be sold, although perhaps more appropriately it might be traded for a small parcel contiguous to the north line of the main parcel.

In general, tree condition on the whole tract is good; there are only a few dead or dying trees. Average tree size is fairly small as most of the larger trees were removed in the timber sale.

There are two other points of interest or consideration in managing this tract. First are the stone culverts or bridges that were used to cross the streams on the access road that went from the barn to the field west of the brook. If the road is to be upgraded, that is, filled and graveled, then care should be taken to keep the road lower than the culvert and not over it as water going over the culvert may wash out the abutment and cause the culverts to collapse.

Second is the present ground cover throughout the entire tract. It has been an active farm with hay cutting and extensive animal grazing. If those activities cease, then there will be sweeping changes in the present condition (brush invasion), unless artificial means are used to maintain the "status quo" (mowing, etc.).

Some consideration of leasing hay or grazing rights on the unused portion might well be a way to maintain the present open condition at a minimal expense.

I. WILDLIFE CONCERNS

The presence of and abundance of wildlife in an area is dependent on the physical features of the land, the fertility of the soil, the available water, and the type and quality of vegetation present. Each species has specific requirements for survival which are provided for by certain vegetative classes or different stages of succession. If the animal's requirements are not met, the animal will move to another area.

To attract and/or increase the number and type of wildlife in an area the requirements of each species must be provided. By providing different types of habitat or habitat diversity these needs can be met. Food, cover,

a water source, nesting and roosting and brood rearing sites must be within reach of the daily movements of the animals. The greater the interspersion or degree to which different habitats are mixed or repeated, the greater the wildlife use of the area will be.

Often times an animal's requirements can be met in a small area. Sometimes a species has a large home range and requires much space for survival. Neighboring land adjacent to that under management can sometimes supply a habitat requirement which is lacking.

Each animal must have all the requirements for survival within its home range or it will migrate to a new area. The home range can vary with seasonal and migratory needs.

All species need a certain amount of space to call their own. They need space for nesting, breeding, feeding and rearing young. Some species have a high tolerance to crowding wthin their own species and with other species while others do not. Others need large areas with little competition with their own kind or with other species. This is why a fertile piece of land will not produce unlimited amounts of wildlife.

If a certain factor which a species requires is lacking, or in short supply, it is said to be a "limiting factor". The lack of it will limit the population or perhaps even the presence of the species itself.

Within the limitations imposed on an area by the quality and quantity of natural physical features, management can ensure the maximum production of sustained wildlife populations through manipulation of vegetative types and age classes.

One can concentrate on providing the requirements for certain specific or "target species". Ideally, this will allow these species to proliferate to their maximum extent within the limits of the habitat provided. This may incidentally benefit other wildlife, but could also be detrimental and lead to their emmigration from the area. A species not being managed for may have the same requirements as the target species and may become an unwanted pest.

By providing a number or variety of habitats or different vegetative classes in different successional stages in a desirable mix or interspersion for the individual, good wildlife habitat can be provided for a variety of species.

Mature woodlands often make up more than half a management area. Ideal habitat can be managed by having approximately three-fourths (3/4) of the property in even-aged stands (trees all the same age, but not necessarily the smae size) and one-quarter (1/4) in uneven aged stands. Eventually the management unit would approximate one-quarter (1/4) seedling

sapling stands, one-quarter (1/4) pole stands, one-half (1/2) sawtimber stands. If these stands of different ages were well mixed, optimum wildlife habitat will result and it will be sustained. Open areas are very useful to wildlife for feeding, brood rearing and nesting sites. About two percent of an area should be kept in permanent grass/legume plots. Approximately 5 percent should be kept in early successional native vegetation.

This parcel owned by the Town of Lisbon, contains a mosiac of habitat types. The woodland habitat consists of mixed hardwoods species of oak and maple and reverting field habitat containing scattered cedars and multiflora rose are located in the eastern section of the property. A small brook flows through the fields creating wetland swamp habitat vegetated primarily by thick growths of skunk cabbage and marsh marigold.

The habitat on the property is ideally suited for use as a nature trail or environmental education area because of the variety of habitat types present and existing skid trails that bisect the area. The future level of development (school facilities, tennis courts, ballfields) on this property can have either a minimum or maximum effect on wildlife species as habitat types are lost.

Environmental Education/Nature Trail

Trails are the key to bringing people and wildlife together. They should be located to take advantage of terrain and existing habitat. Effective trail planning and layout can enhance the learning and aesthetic aspects of outdoor recreation by providing easy access to varied habitats.

Planning Trails

1. Know the characteristics of the property and plan the layout so that the trail passes by or through a variety of habitat types.

2. Make sure the trail is safe as well as exciting.

3. Follow a closed-loop design, beginning and ending at the same point.

4. Avoid long, straight stretches. Trails with curves and bends are longer, add an element of surprise and anticipation, and seem more natural. Straight stretches hsould not exceed 100 feet.

5. A well marked trail system should be established along with an accompanying informational pamphlet. This will allow interested individuals not just organized groups to have an educational opportunity. If management practices are conducted (i.e. openings, plantings, bluebird boxes) they should be discussed. The major wildlife topic to emphasize should be vegetation types/succession and its value to wildlife.

6. Habitat development projects could be used to provide excellent hands on experience:

a. Construct and install bluebird boxes along with cataloging yearly nest box results.
b. Conduct various studies to document wildlife diversity and abundance by habitat types (i.e. bird transects, small mammal trapping, amphibian and reptile trapping, vegetation transects and photographic plots).
c. Have youth groups do some wildlife projects (conifer plantings, brush piles, etc.).

For any further assistance regarding overall guidelines or species specific management recommendations feel free to contact the Eastern District Office, 295-9523.

J. FISH RESOURCES

Site Description

A portion of Lawrence Brook , approximately 0.4 miles flows through the proposed development site in Lisbon, Connecticut. The physical character of Lawrence Brook varies considerably in this area. The northern section flows through a small wetland area bordered by common wetland grasses and vegetation. Waters are slow moving due to a slight gradient change. Brook width varies from 2 to 5 feet. Stream bottom mainly consists of silt and mud. Streamside banks are unstable with limited amounts of overhanging vegetation.

Conversely, mid to southern sections of Lawrence Brook flow through pasture lands. Stream velocity increases in this section due to a moderate gradient change. Brook width ranged from 3 to 7 feet. Stream bottom is comprised of sand, gravel and some rocks. Numerous well-defined riffles and a small number of pools are available. Streamside banks are relatively stable containing sparse areas of overhanging trees.

Fish Population

At present, the brook appears to support a limited recreational fishery. Several stream species of fish would be expected on inhabit the brook, primarily white suckers, fallfish, blacknose dace and brook trout. Generally, water quality appears to be adequate, although several areas contain dense sections of filamentous algae. The presence of algae suggests that the brook

may periodically receive artificial source(s) of nutrients.

Impact and Recommendations

The development of a 0.66 acre skating pond will not have any major impact upon the aquatic resources in Lawrence Brook. Proper erosion and sedimentation structures should be utilized during construction. Any future development on this property that borders Lawrence Brook should provide for a 100 foot stream buffer zone. This protective strip will prevent erosion and sedimentation problems and maintain stream ecology.

The lower section of Lawrence Brook does contain suitable habitat for brook trout. If desired, this area could be stocked with brook trout in order to create a recreational fishery.

K. PLANNING AND RECREATION

Although the primary focus of this ERT is to evaluate the 63 acre parcel, this tract has considerable significance to Lisbon from a community planning standpoint and in this section there will be certain comments from that perspective. First of all, the Town Center at Newent is somewhat weakly defined, especially on the west side of Route 169. Therefore a high priority should be given to restoration of the Whittaker House to strengthen the sense of physical unity of the village. It is suggested in the same regard that the Town encourage the neighboring gas station to install a more attractive facade, preferably Colonial design, to further strengthen the visual character of the Town Center.

A second issue relates to the proposed development of a K-2 or K-3 school on the subject property. If feasible, the Team Planner feels that it would be preferable to build the school within the existing school complex on Route 138, just east of Route 169, for greater efficiency of operation.

Finally, the location of the property at the very center of the community can add substantially to the visual character of the center, be more readily accessible to the Town's population as a whole, and serve as a site for community-wide functions and events.

In evaluating the property itself, it is clear that the bulk of its acreage has moderate to serious limitations in terms of stoniness, poor drainage, and also slope to some degree. Therefore development options are rather limited. Nevertheless it is these various limitations which would

make it desirable and attractive as a park and as an area for environmental education for children in the nearby Town School.

Specific comments include:

(1) Whittaker House - The house itself if not the barns should be restored as stated above as a key local landmark in the Town Center. If to be open eventually as a museum, it should qualify for a restoration grant from the Department of Economic Development's Historic Assets Fund. A parking lot servicing the museum could be developed on the narrow roadside flat immediately south of the house.

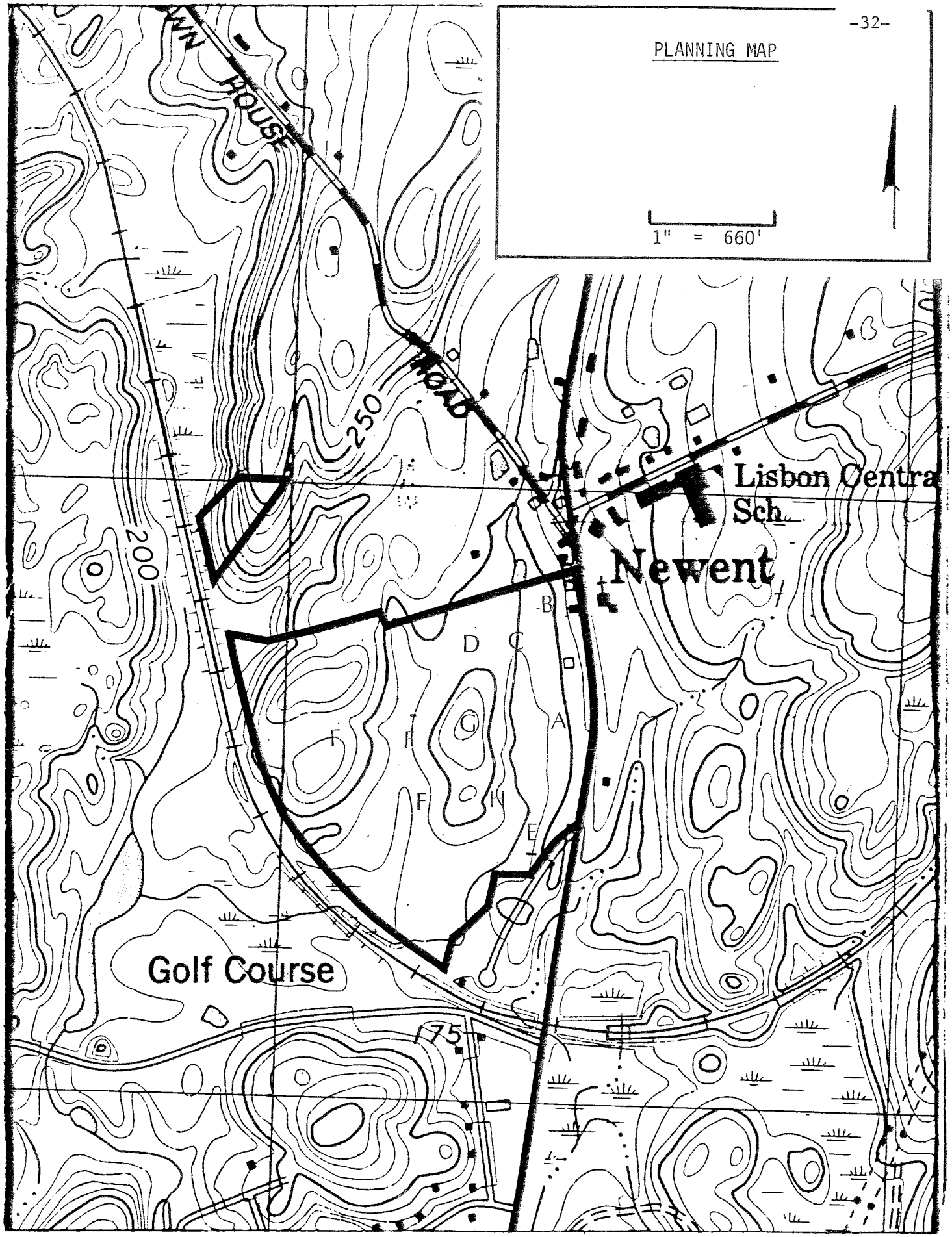
(2) Although it would be desirable from a design standpoint to strengthen the village center through location of other civic buildings such as the proposed school or community center along Route 169 in the vicinity of the Whittaker House and the church, the narrow width of level frontage combined with the sharp dropoff to the valley to the rear militate against such a location. One possible solution to this site problem would be to build a split level structure into the hillside, with a lower floor facing out onto the valley. Nonetheless, assuming that a roadfront location would be preferable for the school or other civic building, the sole readily-usable location would be in the meadow marked A on the planning map, where the slope is relatively gentle.

(3) The barn (B on map) southerly of the Whittaker House seems to be in good repair and probably should be retained for the foreseeable future as a landmark and used either by a farmer leasing the cleared portion of the property or by the community for purposes related to the management of the park.

(4) Related to (3) above, the cleared hay and pasture land should be leased to a local farmer to prevent reversion to brush and thereby maintain the beauty of the property. In particular, the pleasant pastoral character of the fields along Route 169 should be maintained by mowing, either through lease or by the Town.

(5) The brook-wetland complex (C on map) west of the Whittaker House and the barn described in (3) above seems an ideal location for the proposed skating pond.

(6) The sole locations seemingly suitable for ballfields are seen at (D) and (E) on the map. Because of relative ease of access, it is recommended that (D) be so utilized, with access following the routing of an existing farm road and located approximately as sketched on the referenced map. Other developed recreational facilities apparently could be located here including a quarter mile track surrounding a soccer field.


PLANNING MAP
1" = 660'
RIN HOUSE
250
ROAD
200
Lisbon Centra
Sch
Newent
B
D
C
A
G
F
F
F
H
E
Golf Course
175

(7) Much of the wooded portion of the property has been stripped of trees of merchantable size. However a fair volume of felled wood is seen, causing an unsightly condition at (F) on map. Thus some limited cleanup in the form of salvage cordwood cuts could be visually beneficial as well as preventing waste of wood. Development of nature trails could utilize the old cartroads/farm roads throughout the property.

(8) No recommendations are offered for the isolated four acre tract, although Town purchase of the intervening acreage to allow its incorporation into the park should be considered.

(9) Two vegetative points of interest include a rocky hillock crowned with several large decidous trees at (G) and a very large pasture oak at (H) on map, both of which merit preservation.

(10) The property seems to have little or no potential for development of a swimming pool, as there appears to be no aquifer or community water system to supply the required volume of water needed for such a facility.

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--an 86 town 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, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. 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 Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.