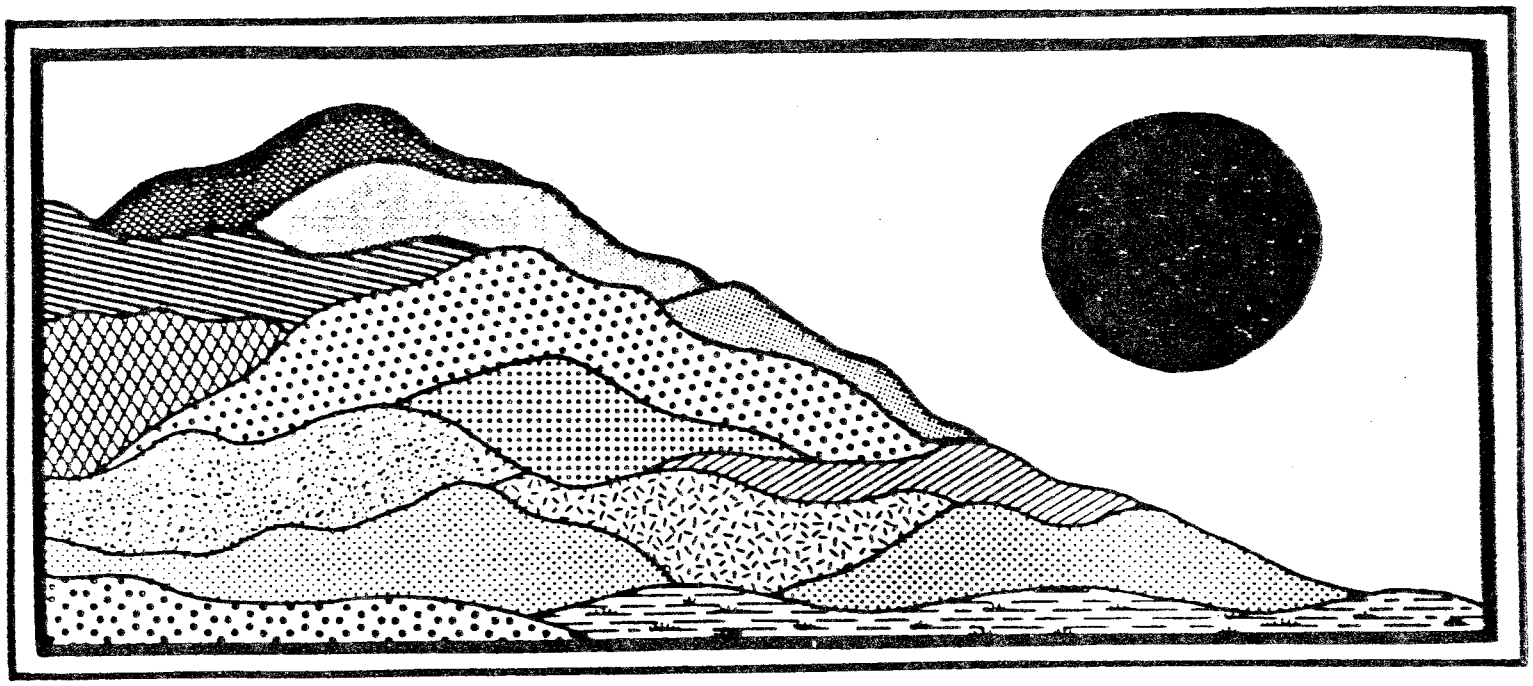
Research/Executive Park

Old Saybrook, Connecticut

January 1986



ENVIRONMENTAL REVIEW TEAM REPORT

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Research/Executive Park

Old Saybrook, Connecticut

Review Date: OCTOBER 31, 1985

Report Date: JANUARY 1986

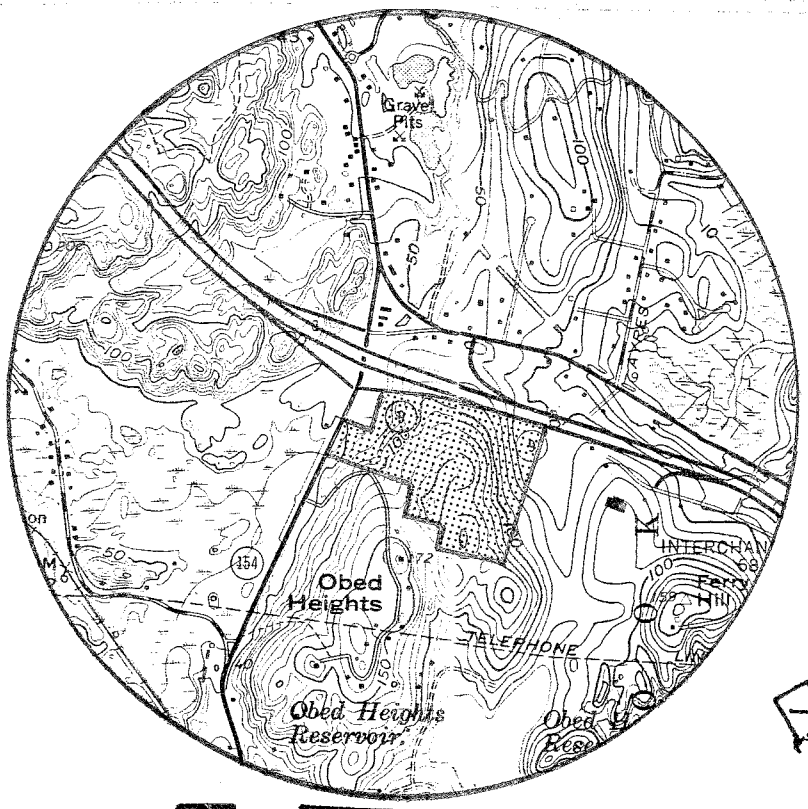
RC&D

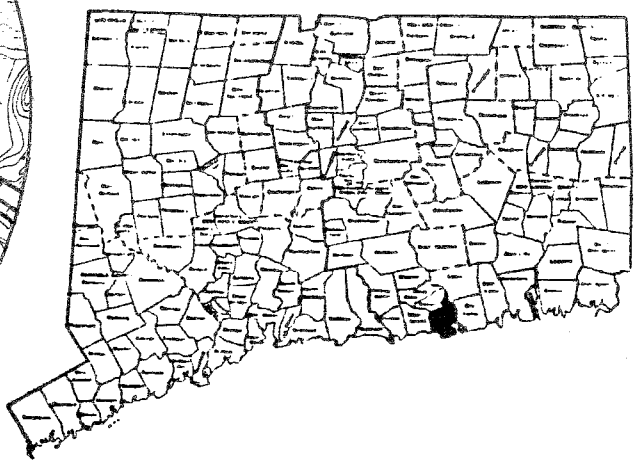
ENVIRONMENTAL REVIEW TEAM
PO BOX 198
BROOKLYN, CONNECTICUT 06234

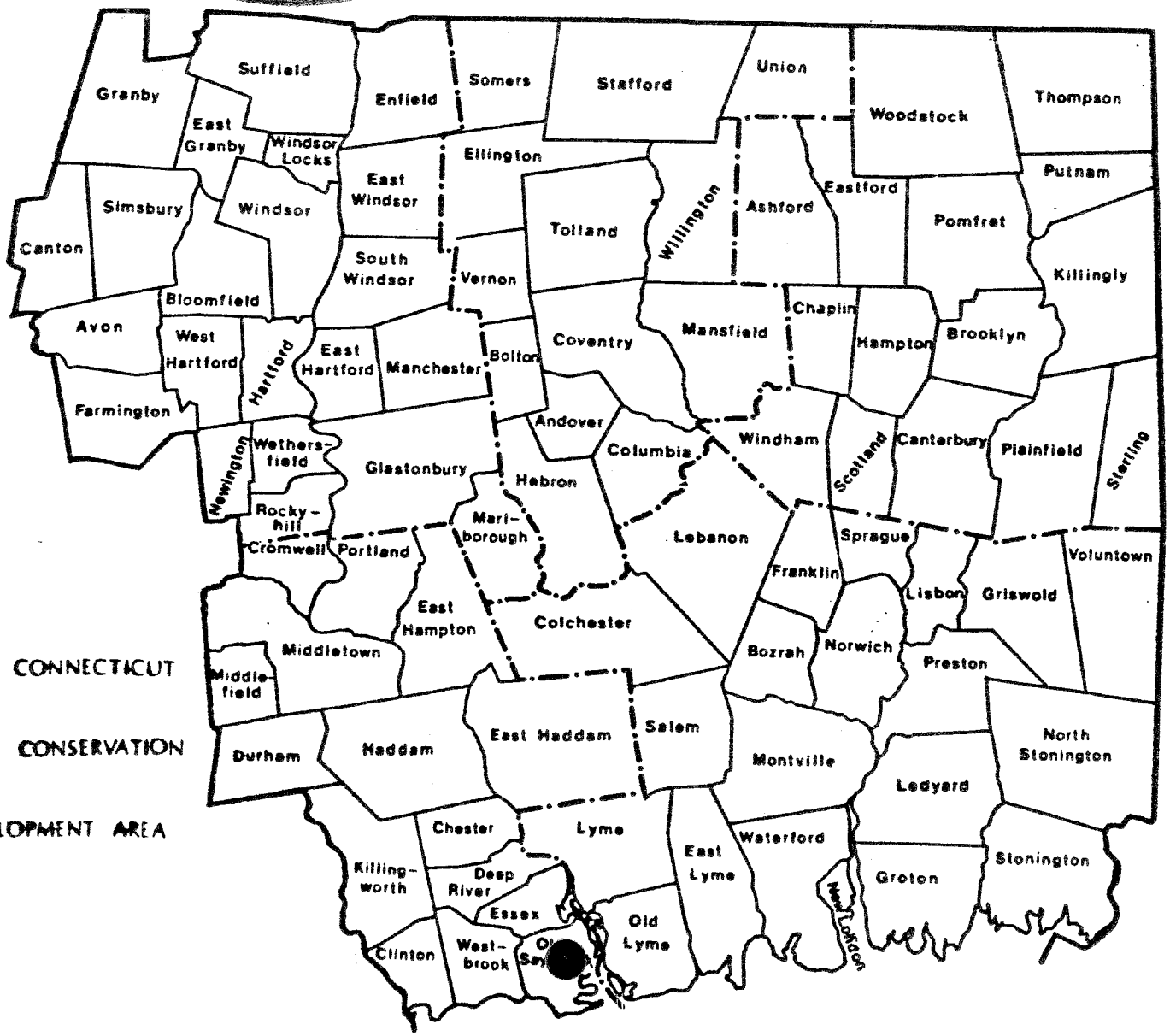
Site Location

PROPOSED CORPORATE/EXECUTIVE PARK

OLD SAYBROOK, CONNECTICUT







EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT
ON
A PROPOSED RESEARCH/EXECUTIVE PARK
OLD SAYBROOK, CONNECTICUT

This report is an outgrowth from the Old Saybrook Economic Development Commission to the New London 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 Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on Thursday, October 31, 1985. Team members participating on this review included:

Don Capellaro	- Sanitarian, CT Department of Health
Emery Gluck	- Forester, Department of Environmental Protection
Carol Sacknoff	- Wildlife Bureau, Department of Environmental Protection
Pat Scanlon	- District Conservationist, USDA, Soil Conservation Service
Richard Serra	- Regional Planner, CT River Estuary Regional Planning Agency
Elaine Sych	- ERT Coordinator, Eastern CT RC&D Area
Bill Warzecha	- Geologist-DEP, Natural Resources Center
Judy Wilson	- Wildlife Biologist, Department of Environmental Protection

Prior to the review day, each team member received a summary of background information, the EDC's concerns, a location map, a soils map, a map showing the proposed site and adjacent properties, and a copy of the proposed B-5 zone. A large scale topographic map was handed out the day of the review. The Team met with, and were accompanied by members of the Economic Development Commission. 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 the landowner. This report identifies the existing resource base and evaluates its significance to proposed development, and also suggests considerations that should be of concern to the

Town and any developer. 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 Resource Conservation and Development Area hopes you will find this report of value and assistance in making your decisions concerning this area.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern CT RC&D Area
PO Box 198
Brooklyn, CT 06234
(203) 774-1253

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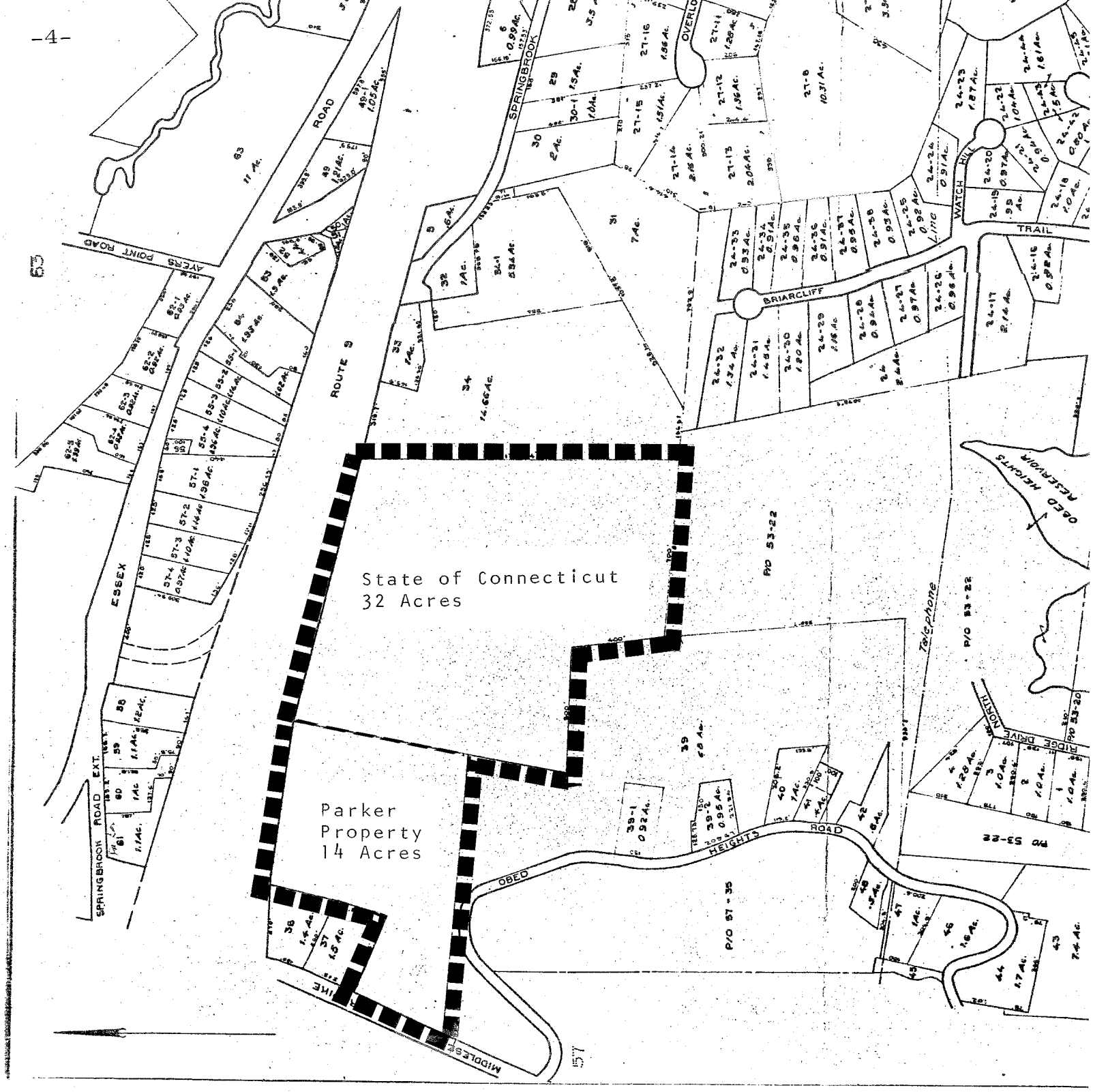


PARCELS LOCATION

SITE BOUNDARY

NOT TO SCALE

I. INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for two parcels totaling 46 acres in Old Saybrook.

It is understood the Town's Economic Development Commission would propose a new type of zone which would allow for the development of a corporate/executive park. At the present time, part of the area in question is zoned business. Most of the surrounding land is in a residential zone.

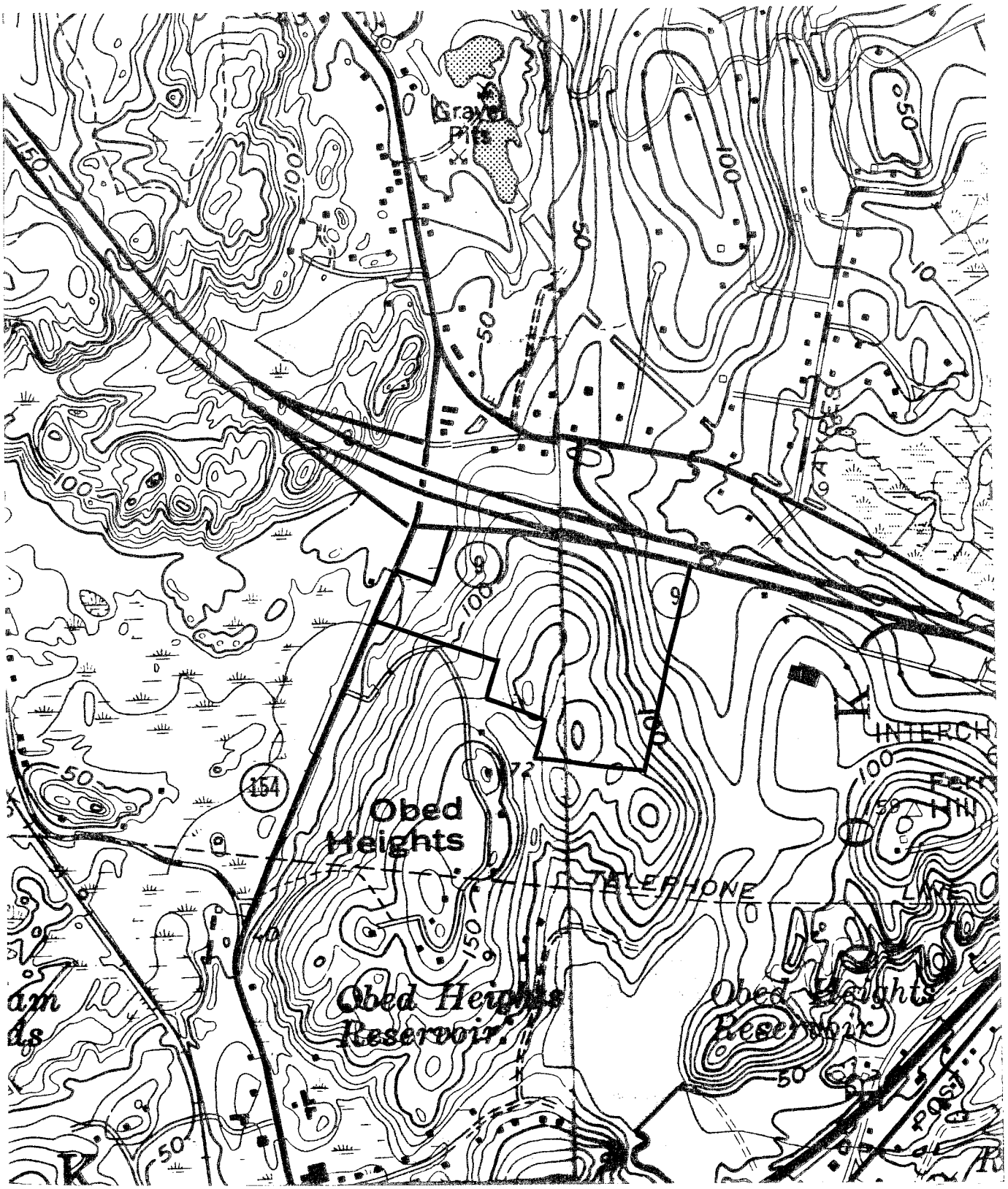
The site, which has considerable frontage along Route 9, is composed of two properties. The smaller parcel has about 14 acres and the larger one, which is owned by the State of Connecticut, consists of some 32 acres. The chief features of the wooded property are: The hillside terrain which rises from Route 9 and Middlesex Turnpike, being more pronounced towards the eastern side, and relatively level at the top; some wetlands and a watercourse at the northeast corner which is piped under Route 9. Most of the flow originates on adjoining land easterly of a racquet club where a large gravel pond is being excavated; an area of wetlands with a seasonal watercourse at the west side which drains under Middlesex Turnpike. The upper portion adjoins Obed Heights where there are around a half dozen houses on the north side of a crossing telephone line right-of-way.

This report may be used as a planning tool in determining site suitability and limitations, and contains recommendations and concerns for land use compatibility and the maintenance and enhancement of the natural environment.

II. TOPOGRAPHY AND SETTING

The two adjacent parcels of land currently being considered by Old Saybrook's Economic Development Commission for a potential Research/Executive Park are located in the northeast corner of Town. The study area is bordered on the north by Route 9 and on the west by Middlesex Turnpike (Route 154). The larger parcel which is 32 acres in size, is currently owned by the State of Connecticut. The smaller parcel, which is 14 acres in size, is under the private ownership of Esther Parker.

The parcel of land comprises the northern end of a bedrock-cored hill locally referred to as Obed Heights.



TOPOGRAPHY

Site Boundary

1"=1000'

Slopes within the parcel range from gentle on the west flank of the hill to moderate on the east flank. The tableland is relatively flat. Maximum and minimum elevation on the parcels are ±160 feet above mean, to about 60 feet above mean sea level.

No major streams were seen on the site during the field review. Two small intermittent watercourses in the eastern and western parts drain the parcels.

III. GEOLOGY

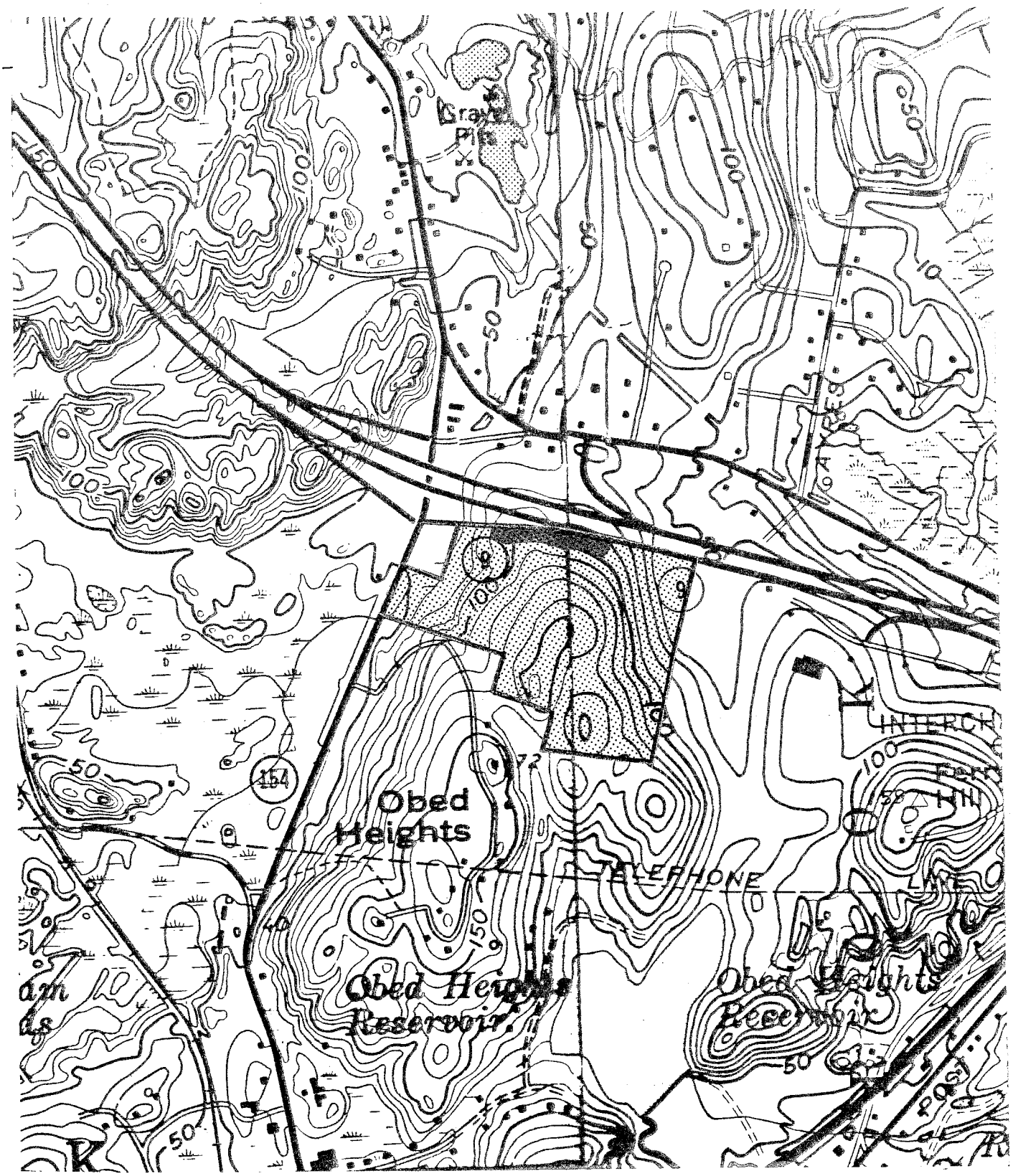
The study area is located in an area that is encompassed by the Old Lyme and Essex topographic quadrangle. Bedrock geologic maps for the Essex and Old Lyme quadrangle by Lawrence Lundgren, Jr. (QR-15 and QR-21, respectively) as well as surficial geologic maps for the quadrnagles (QR-31), by Richard Foster Flint, have been published by the Connecticut Geological and Natural History Survey. All of these maps are available at the Department of Environmental Protection's Natural Resources Center in Hartford.

Bedrock outcrops have been exposed along portions of the northern boundary due to construction of Route 9. Lundgren identifies the ledgerock underlying the site as a member of the Putnam Group (Tatnic Hill Member). These rocks consist of medium to dark gray, medium grained gneisses or schists composed of the minerals quartz, andesine, biotite, garnet and sillimanite. The minerals kyanite, muscovite and potassium fledspar may be encountered in some places. In addition, the rock may be interlayered in places with thinner layers of rusty-weathering graphitic, pyrrhotitic two-mica schists, amphibolites or calcsilicate rocks. The rocks foliation (orientation of certain minerals in the rock), which normally parallels the rocks relict bedding in this formation, dips moderately to the northwest.

The term "gneiss" refers to rocks that are composed of flaky, platy or elongate minerals which alternate with granular minerals giving the rock a banded appearance.

"Schists" are classified as rocks whose aligned mineral layers are abundant and, as a result, give the rock a slabby appearance. The gneisses and schists in the rock unit grade into one another and may be seen together in a single exposure. "Amphibolites" refer to rocks consisting mainly of the amphibole minerals hornblende and plagioclase. The adjective "calcsilicate" mentioned above, refers to rocks rich in the major rock forming minerals silicates and calcium.

Depth to bedrock ranges from zero, where bedrock outcrops along the northern boundary, to probably not much more than 10 feet elsewhere on the parcels.



BEDROCK GEOLOGY

Tatnic Hill Formation

Bedrock Outcrop Areas

1"=1000'

Surficial geologic materials refer to unconsolidated rock particles and fragments that overlie solid bedrock. Most of the site is covered by a glacial sediment called till, that was derived largely from the schists, gneisses, and amphibotites mentioned earlier. Till consists of nonsorted, nonstratified rock particles and fragments. It was deposited directly from glacier ice without subsequent re-working by meltwater streams.

The upper few feet of till is commonly sandy, stony and friable. Where the till is thicker (perhaps 10 feet or more), a compact layer which is siltier and less stony, may be encountered at depths between 2 and 4 feet.

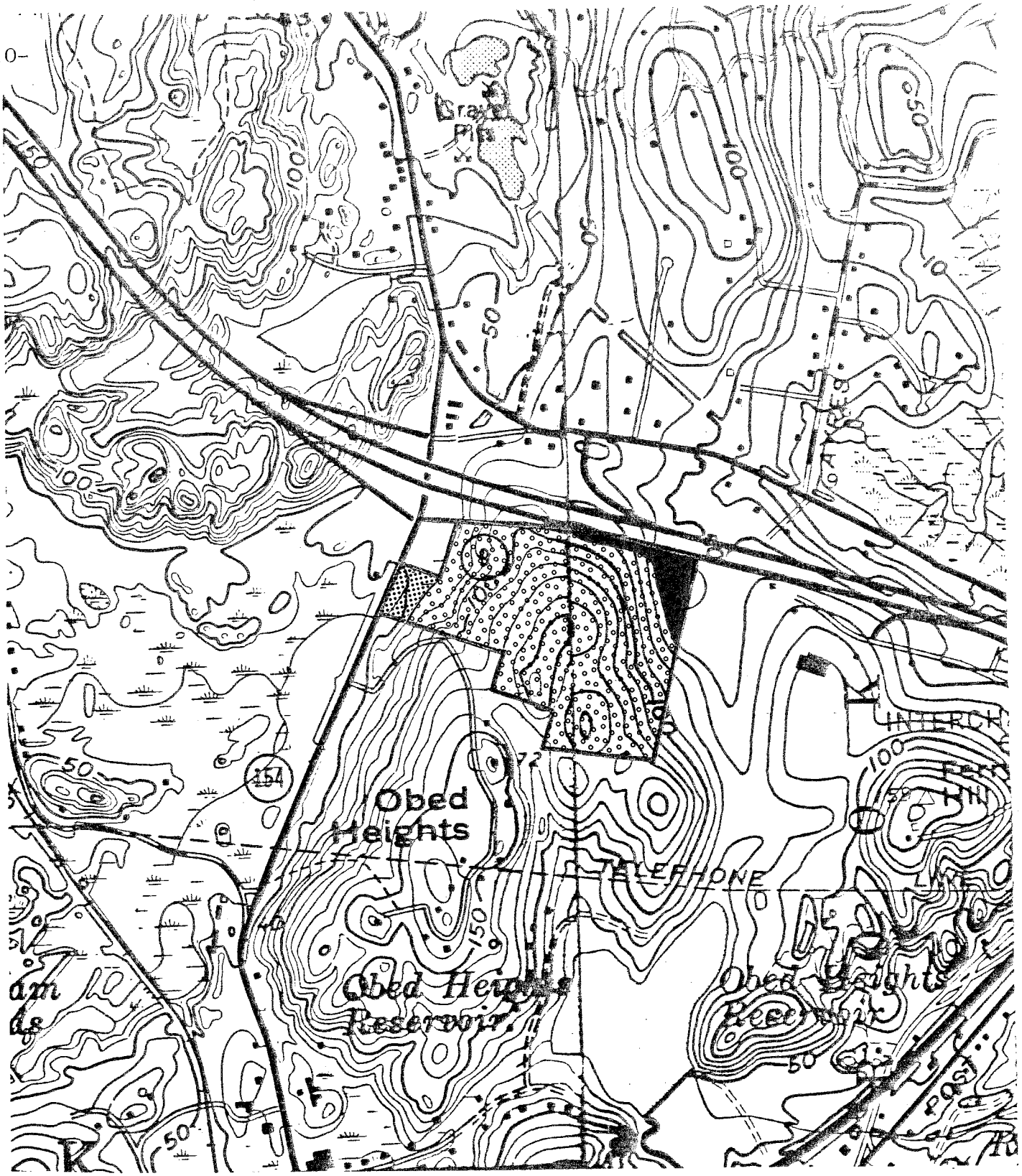
Another glacial sediment overlying till or bedrock along the western boundary is stratified drift. These sediments consist chiefly of poorly sorted sand and gravel which were deposited by glacial meltwater during ice retreat. Thicknesses of the sand and gravel is not great (probably ranging from a few inches at the till contact to not much more than 10 feet at the western most boundary). These deposits do not cover a large areal extent within the parcels.

Seasonally wet areas comprised of regulated inland-wetland soils parallel the intermittent watercourses in the study area.

IV. GEOLOGIC DEVELOPMENT CONCERNS

Based on visual observations made during the field review, any development of the parcels would probably take place on the till soils. The area covered by stratified drift is relatively low and appears to be wet. Since there is no public sewer system serving the town, potential users of the park would probably have to be serviced by individual on-site sewage disposal systems. According to an Economic Development Commission member, a public water supply line terminates about 3,000 feet south of the site on Route 154 (near its intersection with Bokum Road).

No deep test pit information regarding subsurface conditions (i.e., groundwater table, soil types, depth to bedrock, etc.) was available to team members at the time of the field review. Nevertheless, based on soil mapping (Soils Survey of Middlesex County), surficial geologic mapping for both quadrangles, and visual observation, it appears that the major geologic limitations on the site will be (1) areas which have a relatively shallow depth to bedrock (10 feet or less); (2) till-based soils which may have a seasonally high groundwater table and slow percolation rates; and (3) some areas having moderate slopes. These geologic limitations will weigh heaviest on the ability to provide adequate subsurface sewage disposal. In light of these conditions, it seems likely that development on the parcels would only be appropriate at a comparatively low density. Detailed soil testing



SURFICIAL GEOLOGY

Till Deposits

Stratified Drift

Seasonally Wet Areas
(Regulated Inland-wetland
Soils)

1"=1000'

throughout the parcels would need to be conducted in order to determine subsurface conditions. Only then, will the town sanitarian and project engineer be able to accurately assess the capabilities of the soils on the site to accept sewage effluent from potential users of the park without adversely affecting the groundwater, surface water, etc., and also to determine an acceptable density.

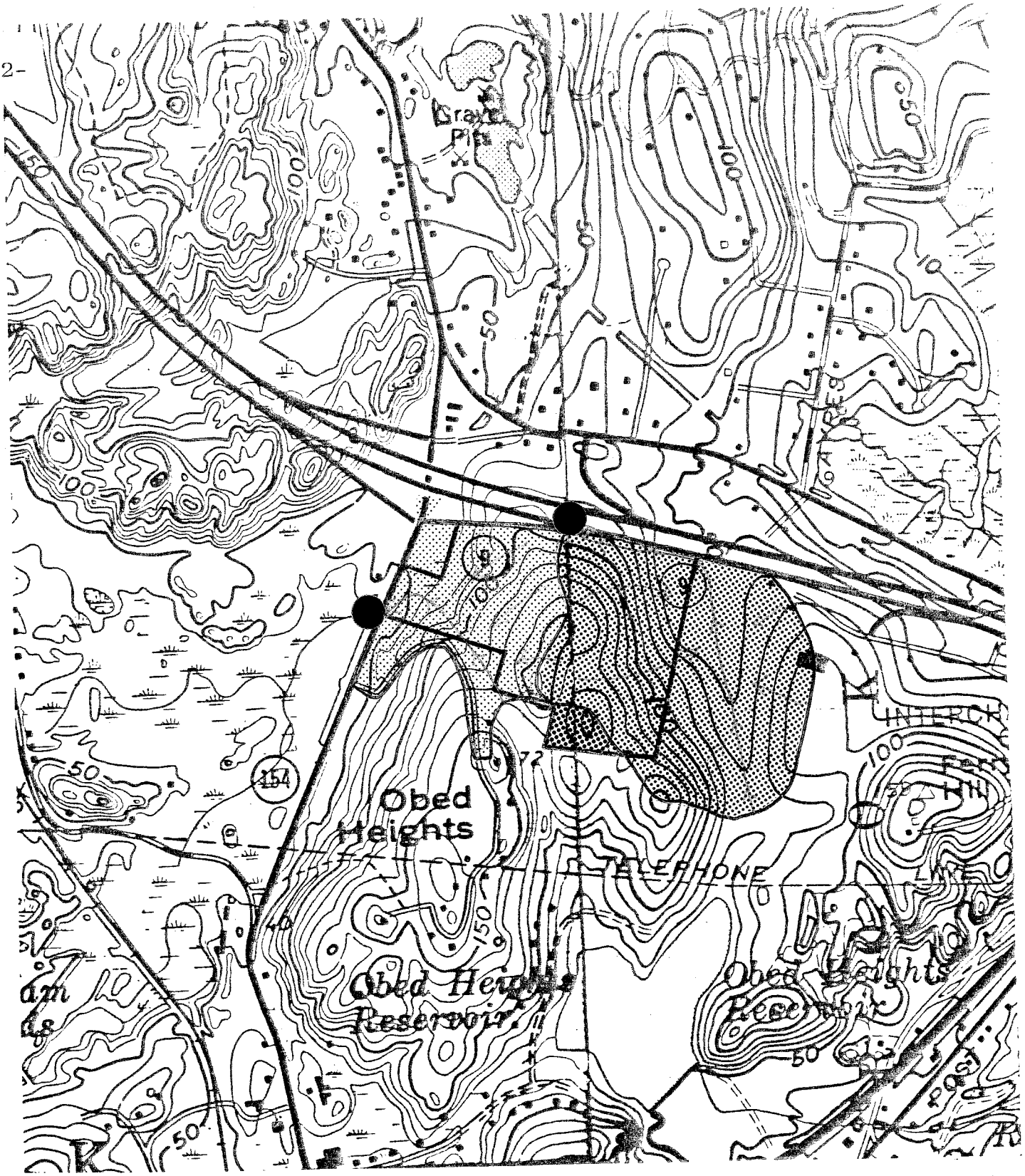
V. HYDROLOGY

Surface runoff on the site may be divided into three areas. Surface runoff generated in western half of the study area drains to the low-lying areas in the western limits. It then flows southward parallel to Route 154 for about 375 feet where it is routed through a 12 inch pipe under Route 154. This unnamed watercourse is a tributary to Oyster River. Surface water generated in the eastern parts flows downslope to a low-lying area which contains a small intermittent stream. It should be pointed out that a relatively large pond is being built in this low-lying area. The intermittent stream flows northward to Route 9, then makes a 90° turn to the west and flows parallel to Route 9. The stream is then routed northward through a four foot culvert beneath Route 9. It ultimately drains into an estuary of the Connecticut River.

A small ±3 acre portion of the study area in the southern part drains southward to Obed Heights Reservoir. Accompanying this report is a Watershed Boundary Map which shows the watershed boundary, direction surface runoff, and streamcourses on the parcels as discussed above.

Development of the parcels in question can be expected to lead to increases in stormwater runoff. The amount of increased runoff will depend largely on the density of the proposed research/executive park, extent of development, amount of vegetation removed, the amount of impervious surface created (e.g., roof tops, paved roads, parking areas) and the timing of development on each lot. Since large parking facilities and buildings may be associated with this type of development, the potential for a significant increase in runoff is greater than would be the case for a low intensity single family home development.

There was no site plan or layout available to Team members to allow the determination of the runoff change likely to occur from land use modifications. Nevertheless, an estimate may be made of the runoff changes likely to occur from the land use modification alone. Several broad assumptions (noted below) were made by the Team's geohydrologist so that the estimates could be made. Technical Release No. 55 of the Soil Conservation Service provides a technique which may be used in formulating the estimate. The method involves the determination of "runoff curve numbers," which relate amount of precipitation to amounts of runoff. It was assumed that a total of six developed areas could occur within



WATERSHED BOUNDARY

Watershed "A"
Watershed "B"
Points of Outflow
Portion of Study Area which drains to Obed Heights Reservoir
Watercourse
Surface Flow

1"=1000'

the parcels; three in the eastern portion and three in the western portions. In addition, it was assumed that about 26% of each developed area or lot would be covered by impervious surfaces, i.e., building roof top, drives, parking areas, etc. This would result in about 6 acres of impervious surface in each of the watersheds (A and B) shown on the Watershed Boundary Map. It should be pointed out that these estimates do not account for the interior road systems and stormwater piping, which would probably increase the amount of runoff following development and ultimately the peak flows to the streams draining each respective watershed.

Therefore, based on the assumptions mentioned above, it is estimated that development in watershed 'A' (the eastern half of the study area) would increase the curve numbers by 3 (from 60 to 63). Under these conditions, the runoff depths for a 10, 25 and 100 year storm event would increase approximately by 16%, 14% and 11%, respectively. It is estimated that development in watershed 'B' (the western half of the study area) would increase the curve numbers by 8 (from 58 to 66). Under these conditions, the runoff depths for the 10, 25 and 100 year storm event would increase approximately 48%, 42% and 32% for the 10, 25 and 100 years storm events, respectively.

Because these increases are significant, especially watershed 'B', it is strongly recommended that a detailed engineering study of the pre and post development runoff for the parcels, as well as a careful stormwater management plan, be prepared prior to any development. In addition, close examination of all downstream culverts should be required to insure that flooding problems do not occur. Of particular concern, will be the 12 inch pipe passing under Route 154, which would receive runoff from watershed "B'. As mentioned earlier, the potential for significant increase in the runoff depth from this watershed following any development could pose flooding problems in this area. In this regard, it may be necessary to investigate the possibility of developing a detention basin for controlling post development increases in runoff or possibly to increase the size of the pipe running under Route 154.

TABLE I

Runoff Volume Increases Estimated for Watershed 'A'
(Estimates are recorded in inches)

	10-year 24-hr. storm	25-year 24-hr. storm	100-year 24-hr. storm
Before development	1.3"	1.67"	2.68"
After development	1.51"	1.90"	2.98"
Percent increase	16%	14%	11%

TABLE II

Runoff Volume Increases Estimated for Watershed 'B'
(Estimates are recorded in inches)

	10-year 24-hr. storm	25-year 24-hr. storm	100-year 24-hr. storm
Before development	1.17"	1.51"	2.48"
After development	1.73"	2.15"	3.28"
Percent increase	48%	42%	32%

TABLE III

Peak Flows for Before Development and After Development Conditions at the Point of Outflow for Streamcourse Draining Watershed 'A' Shown on the Watershed Boundary Map
(All flows given in cubic feet per second [CFS])

	10-year 24-hr. storm	25-year 24-hr. storm	100-year 24-hr. storm
Before development			
*Curve Number 60	37 CFS	51 CFS	89 CFS
After development			
*Curve Number 63	45 CFS	71 CFS	104 CFS
Percent increases	22%	20%	17%

TABLE IV

Peak Flows for Before Development and After Development Conditions at the Point of Outflow for Streamcourse Draining Watershed 'B' Shown on the Watershed Boundary Map
(All flows given in cubic feet per second [CFS])

	10-year 24-hr. storm	25-year 24-hr. storm	100-year 24-hr. storm
Before development			
*Curve Number 58	26 CFS	34 CFS	60 CFS
After development			
*Curve Number 66	42 CFS	54 CFS	88 CFS
Percent increase	61%	59%	47%

VI. WATER SUPPLY

At the present time, public water is not available for this area. It is understood the public supply (Connecticut Water Co.) terminates at the junction of Bokum Road and Middlesex Turnpike which is approximately 3,000 feet south of this property. In lieu of having the availability of public water, it would necessitate the siting and development of an on-site central type well water system or installing one or possibly more wells for each individual building lot within the park.

It was indicated to Team members by the Economic Development Commission members on the review day that it seemed likely that if the parcels are developed, that public water would be extended to serve the park. Nevertheless, if an individual on-site well or wells was desired by a prospective user of the park to supplement the public water facilities, the underlying bedrock appears to be the only suitable aquifer to tap. A bedrock well is commonly capable of providing small but reliable yields of groundwater to individual wells. A survey of bedrock wells in the lower Connecticut River Basin (see Connecticut Water Resource Bulletin #31) indicates that more than 80 percent yielded 3 gallons per minute or more; 50 percent yielded about 7 gallons per minute or more, and 10 percent yielded 18 gallons per minute or more.

It is not known whether or not prospective users of the research/executive park would generate pollutants (e.g., organic compounds, hydrocarbons such as gasoline and oil, other chemical substances) which could be a serious threat to water quality on or off site. If proper precautions and care in operations are not taken, certain types of substances such as those mentioned above may render water unusable for potable purposes. Perhaps consideration could be given to screen prospective users of the potential park by local and state officials to determine the type of wastes they might generate. On the other hand, there may be types of industry which could locate here with no more impact on water resources than residential development at medium to low density.

There would, no doubt, be a number of factors involved and which need to be evaluated in considering the feasibility as well as the economics for such a park development. Certainly one would think that the availability of public water and public sewers or at least one of the two utilities would be needed in order to attract and provide necessary support services for any responsible companies which may want to locate in the area. In this case, the extension of public water in order to be able to provide the property with a safe, potable and adequate water supply would warrant most serious consideration in order to resolve one basic component for property development. Certainly without such a service, the overall density of development becomes more crucial. Where both on-site sells and subsurface sewage systems are utilized, large sites should be provided in order to reduce the chance of well pollution and degradation of water quality and protect the public health.

VII. SEWAGE DISPOSAL

The Town does not have public sewerage facilities, therefore, the property in question would be served by on-site subsurface sewage disposal.

Based on visual observations of the terrain and consideration of soil mapping data, it seems that at least a portion of the land area should be feasible for sewage disposal purposes. In general, this would be the land from around the central part towards the west-northwest. The terrain in this area has less steepness of slope and does not join into a pronounced wetlands/watercourse area which is located near the other low corner (NE) of the property. The makeup of soils (mapping data) apparently have good drainage and the potential for development. The main concern or limitation would be with the degree and size of stones which may be present. Also in the area along the Route 9 cut, rock was apparent. Whether or not large stones and/or underlying rock would be a significant factor in locating suitable areas for the installation of subsurface sewage leaching areas would depend upon several conditions. Certainly it would be most important to adequately test areas in order to determine the depth of soil overlying any ledge rock or the extent of any large stones or boulder fields. Also, to find out about groundwater as well as soil percolation and/or permeability. The design of leaching systems depends on the contour and slope of the ground surface and any underlying continuous rock. The depth of soil both under the actual leaching system area(s) and in a down slope direction are critical factors. If rock (ledge) is found at a depth of 7 feet or less, particular care should be taken, especially if flows tend to be rather substantial. The Public Health Code requires that the bottoms of leaching systems be elevated a minimum of 4 feet above ledge rock. This and the depth of soil down slope from the leaching system would be necessary factors to provide for adequate treatment and dispersal of sewage effluent.

It is also noted that well pollution problems are likely to be more frequent in areas where underlying shallow ledge rock is a factor, particularly where there are a number of lots (density) involved, and each is to be served by on-site sewage disposal system and water supply well. The best way to prevent the occurrence of well problems is to extend public water supply if available.

Perhaps some of the most important questions for the development of the properties for intended park purposes would be the overall density, size and number of persons projected for individual research/corporate buildings and utilities that would or would not be available.

VIII. SOILS

A detailed soils map of this site is included in this section of the report, accompanied by a chart which indicates soil limitations for various urban uses. The soil limitation chart indicates the probable limitations for each of the soils for on-site sewage, buildings with basements, buildings without basements, streets and parking, and landscaping. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication Soil Survey, Middlesex County, Connecticut, can aid in the identification and interpretation of soils and their uses on this site.

Soils on the site are primarily fine sandy loams derived from glacial till. The Paxton and Woodbridge soils have a more compact and firmer substratum than the Canton and Charlton soils at a depth of about two feet which impedes downward movement of water and results in seasonally high water tables.

Glacial outwash-derived soils occur along Route 154 and include Sudbury sandy loam (SgA), Walpole sandy loam (Wd) and Windsor loamy sand (WuB). The rapid permeability of these soils increases the risk of groundwater pollution.

The Walpole sandy loam and the Leicester, Ridgebury and Whitman extremely stony fine sandy loams are poorly and very poorly drained soils regulated under P.A. 155. The moderately well-drained Sudbury sandy loam is a prime farmland soil.

Development of this property for a corporate/executive park will require careful planning for siting of roadways, parking lots, buildings and septic systems. Due to the varied topography, extensive grading will be necessary. This will increase the erosion hazard during construction. A detailed plan should be prepared to provide for control of sediment and erosion and proper site drainage during and after construction. The 1985 Connecticut Guidelines for Soil Erosion and Sediment Control should be referred to in preparation of this plan. Technical assistance in development of sediment and erosion control plans is available upon request from the Middlesex County Soil & Water Conservation District in Haddam.

Septic systems will have to be carefully sited and engineered due to slopes, the presence of bedrock outcrops, and seasonally high water tables.

The Canton and Charlton very stony and extremely stony fine sandy loams are moderately sloping, well-drained soils occurring on upland hills, ridges and glacial till plains. Areas of this unit consist of Canton soil or Charlton soil, or both. These soils are mapped together because they have no significant differences that affect their use and management. These soils have

fair potential for development, with stoniness and slope being the main limiting factors. On-site septic systems will need careful design and installation.

The Hollis-Charlton complex consists of moderately steep to very steep, somewhat excessively drained and well-drained soils on bedrock ridges and upland glacial till plains. Again, the soils in this complex are in such an intricate pattern that it was not practical to map them separately. They have poor potential for community development due to steep slopes, shallowness to bedrock, rock outcrops and stoniness. Excavation is difficult because of the shallow soil depth to bedrock in many places. On-site septic systems require very careful and often, special design and installation.

The Leicester, Ridgebury and Whitman extremely stony fine sandy loams are nearly level to gently sloping, poorly drained and very poorly drained soils in drainageways and depressions of glacial till uplands. These soils are inland wetlands regulated under P.A. 155. They have poor potential for community development due to wetness and stoniness.

Paxton and Montauk very stony fine sandy loams are well-drained soils which occur on sloping to steep drumlins and glacial till plains of glaciated uplands. The very stony phase has 0.1 to 3 percent and the extremely stony phase 3 to 15 percent of the surface covered with stones and boulders. These soils have fair potential for community development due to slopes, a slowly permeable or very slowly permeable substratum, and stoniness. On-site septic systems require careful design and installation, as steep slopes of excavations slump when saturated, and foundation drains may be needed in some areas to help prevent wet basements.

Sudbury sandy loam is nearly level, moderately well-drained soil found in slight depressions of broad outwash terraces and in narrow stream valleys. This soil has a seasonal high water table at a depth of about 20 inches from late autumn until mid-spring, and is slow to warm up and dry out in the spring. It has fair potential for community development. Because of a seasonal high water table, on-site septic systems need very careful design and installation, and sites generally require filling. Pollution of groundwater may occur from on-site septic systems.

Walpole sandy loam is a nearly level, poorly drained soil found in depressions of glacial outwash plains and terraces. This is an inland wetland soil regulated by P.A. 155.

Windsor loamy sands are excessively drained soils on broad glacial outwash plains and stream terraces. The soil has good potential for community development. Steep slopes of excavations are unstable. On-site septic systems could be a pollution hazard to groundwater in some places. The soil is droughty, and lawns, shallow-rooted trees, and shrubs need watering in summer.

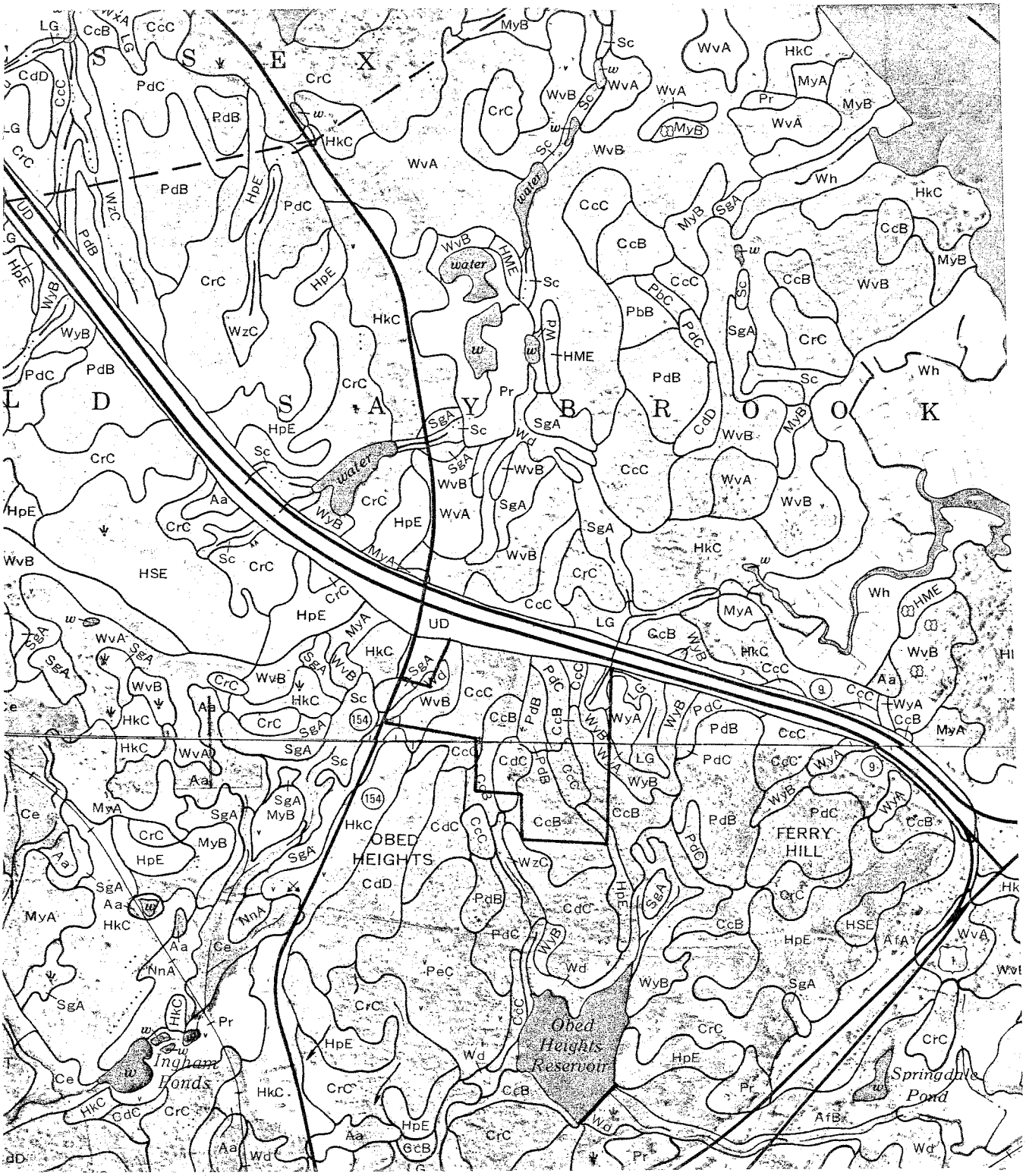
United States Department of Agriculture

Soil Conservation Service

Middlesex County USDA-SCS
Middlesex County Extension Center
Haddam, CT 06438
345-4511

4

SCALE 1" = 1320'



SOIL LIMITATIONS FOR CERTAIN LAND USES

MAP SYMBOL	SOIL NAME	PRINCIPLE LIMITING FACTORS	ON-SITE SEWAGE	BUILDINGS W/BASEMENTS	STREETS & PARKING	LANDSCAPING	BUILDINGS W/OUT BASEMENTS
CcB	Canton & Charlton very stony fine sandy loams 3-8% slopes	Large stones	Moderate	Moderate	Slight	Moderate	Moderate
CcC	Canton & Charlton very stony fine sandy loams 8-15% slopes	Slope Large stones	Moderate	Severe	Moderate	Moderate	Moderate
CdC	Canton & Charlton extremely stony fine sandy loams 3-15% slopes	Large stones Slope	Severe	Severe	Moderate	Severe	Severe
HpE	Hollis-Charlton extremely stony fine sandy loams 15-40% slopes	Slope, Large stone Depth to bedrock in Hollis	Severe	Severe	Severe	Severe	Severe
LG*	Leicester, Ridgebury & Whitman extremely stony fine sandy loams	Wetness Large stones	Severe	Severe	Severe	Severe	Severe
PdB	Paxton & Montauk very stony fine sandy loams 3-8% slopes	Percs slowly Large stones	Severe	Moderate	Moderate	Moderate	Moderate
PdC	Paxton & Montauk very stony fine sandy loams 8-15% slopes	Percs slowly Slope Large stones	Severe	Moderate	Moderate	Moderate	Moderate
SgA**	Sudbury sandy loam 0-5% slopes	Wetness, cut banks Small stones	Severe	Severe	Moderate	Slight	Severe
Wd*	Walpole sandy loam	Wetness, frost action	Severe	Severe	Severe	Severe	Severe
WvB	Windsor loamy sand 3-8% slopes	Droughty Rapid permeability	Slight***	Slight	Slight	Severe-too sandy, droughty	Slight
WyA	Woodbridge very stony fine sandy loam 0-3% slopes	Wetness Large stones	Severe	Severe	Severe	Moderate	Severe

SOIL LIMITATIONS FOR CERTAIN LAND USES

MAP SYMBOL	SOIL NAME	PRINCIPLE LIMITING FACTORS	ON-SITE SEWAGE	BUILDINGS W/BASEMENTS	STREETS & PARKING	LANDSCAPING	BUILDINGS W/OUT BASEMENTS
WyB	Woodbridge very stony fine sandy loam 3-8% slopes	Wetness Large stones	Severe	Severe	Severe	Moderate	Severe
	*Inland-wetland soil regulated under P.A. 155. **Prime Farmland ***Due to rapid permeability ground-water may be polluted.						

Woodbridge very stony fine sandy loam is a moderately well-drained soil commonly located on top of drumlins and concave side slopes of glacial till uplands. Stones and boulders cover .1 to 3% of the surface. This soil has a seasonal high water table at a depth of about 18 inches from autumn until mid-spring. This soil has fair potential for community development. It is limited mainly by wetness and the slowly-permeable or very slowly-permeable substratum. On-site septic systems need very careful design and installation, and sites require filling in places.

IX. VEGETATION

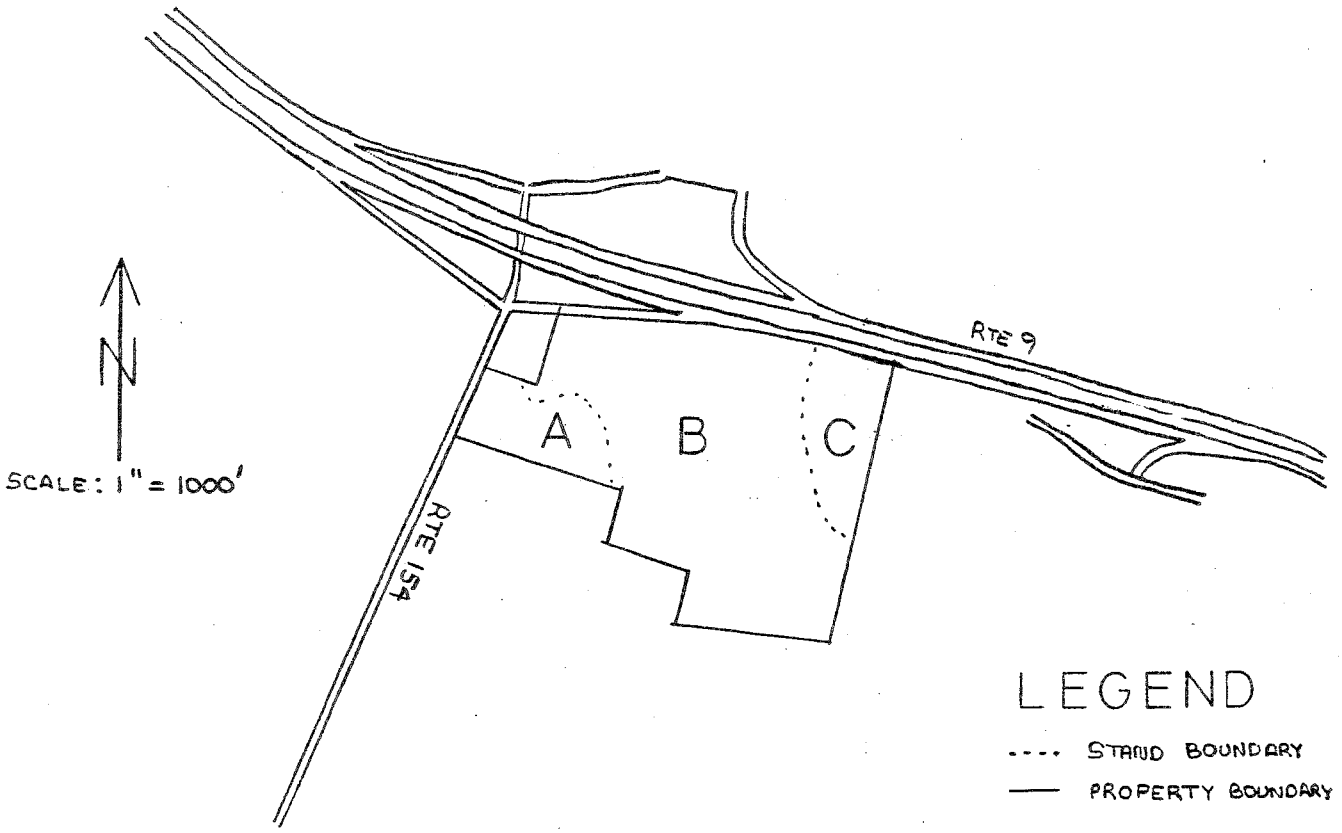
The vegetation of this woodland tract is representative of the central hardwood forest that occurs in southern Connecticut. The property can be divided into three vegetative types. These include a mixed hardwood type, a hardwood swamp type, and an old field type. These stands are described in detail below and their locations are shown on the accompanying map.

Vegetation Type Description

Type A (Mixed hardwoods) This six acre fully stocked stand is made up primarily of medium quality sawtimber (trees larger than 11" in diameter at breast height) trees. The stand is composed of scarlet oak, white oak, black oak, tulip poplar, red cedar, white pine, black birch, and black cherry. Lesser vegetation includes green briar, barberry, spicebush, ground cedar, Christmas fern and shining club moss.

Type B (Old field) This area (34 acres) is reverting to a mixed hardwood stand. It is presently understocked with poor quality sapling (trees 1.1 to 6" in diameter at breast height) and poles (trees 6.1" to 11" in diameter at breast height). Apple, grey birch, black cherry, red cedar, red maple, black oak, and whie oak are the main species present. The lesser vegetation includes grapes and green briar, and dewberry.

Type C (Hardwood type) This 6 acre fully stocked stand is made up of poor quality poles and sawtimber trees. Red maple, black gum, American elm, black cherry, and black oak are the main three species. Understory vegetation includes highbush blueberry, shining club moss, ground cedar, mountain laurel, maple leaf viburnum and clethra.



VEGETATION TYPE DESCRIPTION

Type A Mixed hardwoods, fully stocked, sawtimber size; 6 acres

Type B Old field, understocked, pole and sapling size; 34 acres

Type C Hardwood swamp, fully stocked, pole size; 6 acres

Sapling size: trees 1.1" to 6" in diameter at breast height (DBH)

Pole size: trees 6.1" to 11" DBH

Sawtimber: trees 11.1" or greater at breast height

Aesthetic Considerations

This forested parcel of land offers various aesthetic amenities that may attract corporations to this site. The current zonings, which permits a maximum of 75% of the land to be developed, would allow the possibility of leaving much of the forest intact (at least 11.5 acres). A continuous forest may appear more natural than individual trees that are more spread out over an area. If retained along the property's boundaries, a continuous forest would offer good screening effect to neighbors of the corporate/executive park.

Large, healthy trees are usually considered aesthetically pleasing and should be retained where possible. Most of the dominant tulip poplar, black oak, and red maple should be able to grow to 20" in diameter. Vegetation Type A contains the largest and healthiest specimens, while Vegetation Type C contains a fair amount of unhealthy and defective trees. The large healthy trees of Vegetation Type A would allow for a very attractive entrance to the corporate park (assuming the access road would be off Route 154 and cut through it). Vegetation Type A is also reasonably protected from destructive hurricanes due to its location on the lower and middle part of a northwest slope (usually the leeward side of storms). Vegetation Type B is most likely to experience hurricane related damage as it matures due to its exposed location on a hill top. Vegetation Type C probably offers the best fall foliage colors due to the abundance of red maple and black gum. Most of the hill top location would probably offer a good view of the Connecticut River and maybe the Long Island Sound, if the land is cleared.

Limiting Conditions and Potential Hazards

The majority of the hazardous trees occur in Vegetation Type C where advanced decay is present within some of the red maple. These trees can be easily identified and removed prior to construction.

Construction activities should be planned and conducted to minimize disturbances around the trees and in sections of the forest that are to be saved. Road building, filling, excavation and soil compaction (from heavy machine use) may adversely affect the moisture and aeration balance within the soil. This could lead to the decline in tree health and vigor and may eventually lead to the death of the tree within three to five years. Physical damage to the root system and trunk of the tree by machinery may also result in the decline of individual trees.

The removal of a large percent of the trees may have an adverse effect on the remaining trees. The sudden shock of being left in the open may be too much for a tree grown in the forest all its life. Oak will sprout unsightly epicormic branches along its trunk when the trunk is exposed to direct sunlight. Trees in the open are also more susceptible to damage from ice storms

that may cause considerable crown breakage. Windthrow is also more prevalent in areas where a large percent of the trees have been removed.

Management Considerations

The maintenance of healthy and vigorous trees should be a major concern in the development of this tract. Trees that are under stress become weakened and strained. These trees are more susceptible to insects and disease problems and more likely to succumb than healthy trees. Crowded stand conditions will usually lead to a decline in vigor and health of some of the individual trees.

Vegetation Type C is overstocked with trees and would benefit from a commercial fuelwood thinning that follows the "Crop tree selection method." Under this system, the best 100 trees per acre are retained as crop trees. These trees should be spaced approximately 20' apart. One or two trees that are competing for growing space with an individual crop tree should be removed.

Vegetation Types B and C are not experiencing any excessive crowding--management in the near future could include a fuelwood thinning in Vegetation Type B. The thinning should include removal of unhealthy trees and poorer trees competing with better trees for growing space.

Underplanting conifers such as Norway spruce or hemlock on a 12' spacing would eventually help fill out Vegetation Type B and increase the screening effect along the property boundaries. The green briars would have to be controlled mechanically or with chemicals in order for a conifer planting to be successful in Vegetation Type B. Also, white pine would be well suited to be planted on any part of the property that is cleared during construction.

X. WILDLIFE HABITAT

This wooded area provides good habitat for wildlife. The mature woodland contains a variety of oaks, red maple and black cherry along with other species. The oaks provide a mast crop for deer, squirrel and many other species.

There are also areas with a fairly thick understory which provides good cover and food for many types of wildlife. There is abundant sign of wildlife activity on this property. Deer tracks, trails and bedding areas were observed and browsing was also evident.

Spring seeps may also be found on the property. Seeps offer not only a water source but also produce food in the form of insects and aquatic invertebrates. Birds such as turkey and grouse can utilize the insects produced and other animals such as fox, raccoon, coyote, and skunk use aquatic invertebrates as food.

Due to development, the quality of this habitat in general will be reduced for wildlife because an undeveloped area of land will be broken up by buildings and human activity. Those species which require larger undeveloped areas will be forced to leave or reduce their use of the area. Other species which are more adaptable to man's presence may remain and some new species may be attracted to the area.

The following are some basic recommendations which, if followed, may help to lessen the impact on wildlife in this area:

When the initial clearing for building is done, try to leave as many trees and shrubs as possible, especially those useful to wildlife. Some useful species include:

white oak (Quercus albra)
red oak (Quercus rubra)
black cherry (Prunus serotina)
quaking aspen (Populus tremuloides)
red-osier dogwood (Cornus stolonifera)
apple (Malus spp.)

Landscaping can do a great deal to provide habitat and make an area attractive to wildlife. First, leave as many trees as possible around the buildings. This will not only benefit wildlife by providing food, cover and nesting sites (especially for song-birds), but will also be more aesthetically pleasing.

Leave as many snag trees (standing dead trees) and den trees (trees with holes) as possible. These trees are used by insect eating birds and cavity nesting birds and mammals.

Plant trees and shrubs which are useful to wildlife such as:

Janapese barberry (Bergeris bulgaris)
flowering dogwood (Cornus florida)
honeysuckle (Lonicera spp.)
bayberry (Myrica pensylvanica)
red-osier dogwood (Cornus stolonifera)
maple-leaved viburnum (Viburnum acerifolium)
alternate leaf dogwood (Cornus stolonifera)
American holly (Ilex opaca)
red maple (Acer rubrum)
American mountain ash (Sorbus americana)
chokecherry (Prunus virginiana)
autumn olive (Elaegnus umbellata)
winterberry (Ilex verticillata)
American cranberrybush (Viburnum trilobum)

A variety of trees and shrubs should be used. Most species of wildlife need to have cover when they move from place to place. By leaving corridors of vegetation, this will allow wildlife to utilize the area and also have access to adjacent areas. Large expanses of lawn with no trees or shrubs present should be discouraged. These factors will allow wildlife to better utilize

the area and thus make it more attractive to wildlife.

The Old Saybrook Economic Development Commission expressed an interest in creating a "wildlife sanctuary" on this property. At this time, it is unknown how the property is to be developed for corporate use. It is, therefore, impossible to make specific recommendations for such a sanctuary. However, when that information becomes available, a wildlife biologist should be consulted regarding feasibility, design and management of a sanctuary designated for wildlife.

XI. PLANNING CONCERNS

General

The proposed site is located in the southeastern corner of the intersection of State Routes 9 and 154. Two properties are involved in this proposal.

1) (Parker Parcel) A fourteen (14) acre parcel fronting four hundred (400) feet onto Route 154 which is presently zoned B-2 (Shopping Center Business District). This B-2 district includes all of the property of this parcel except for a one hundred (100) foot strip north of the southern property line. This strip zoned residential AA-1 runs east-west the length of the property.

2) (CONNDOT Parcel) A thirty-two (32) acre parcel which adjoins the Parker Parcel to its east. This parcel, and surrounding property, is presently zoned residential AA-1.

The proposal is to re-zone both of these parcels for "Research/ Executive Park" use(s).

The Town of Old Saybrook's 1970 Plan of Development proposes that the future land use of the Parker Parcel be Highway Commercial while the CONNDOT Parcel be used as an Industrial Park. The Plan of Development also proposes that a connector road be constructed through these parcels from Route 154 to Springbrook Road.

The 1975 Regional Plan of Development depicts the future land use of this area as a "village area" suitable for managed growth.

As such, the proposed use(s) would be consistent with both Plans of Development.

Traffic Circulation

Average vehicle trip rates expected to be generated from the proposed use(s) varies from 5.3 trips per day per 1000 sq. ft. of Ground Floor Area (GFA) for Research/Development Centers to 11.7 trips per day per 1000 sq. ft. GFA for General Office use.* The total amount of trips per day generated from a fully developed 46 acre site could be substantial.

The latest ADT (Average Daily Traffic) count for this section of Route 154 shows a 1982 ADT of 10,300.** Using Report 187 and this ADT, calculations were made, which result in generalized counts, showing a present peak hour traffic flow (between 5 to 6 P.M.) on Route 154 of approximately 773 VPH (Vehicles per hour). The generated Peak Hour P.M. flow from the site on a highest use situation would be approximately 191 VPH per 1000 sq. ft. of GFA. The Generalized Capacity of rural two day approaches such as Route 154 is approximately 2300 VPH (*). This shows that Route 154 has the capacity to handle additional traffic flow. The upper limit of additional traffic flow would increase with the use of traffic controls.

Any proposed connector road joining Route 154 to Springbrook Road would seem to be inappropriate for the "Research/Executive Park" development of this site due to the conditions of:

1) The existing development of a Recreation Club in the area between Springbrook Road and the proposed site which includes the excavation of a large pond adjoining the CONNDOT property, and;

2) The existing developed residential neighborhood on Springbrook Road itself. While Springbrook Road has the capacity to handle additional traffic flow, the volume of traffic generated by the proposed use(s) and a through road would not be compatible with the existing Residential area.

The sites four hundred (400) foot frontage on Route 154 has good north/south sight clearance of some five hundred (500) feet.

On-Site

The site contains wetland soils on its western boundary (Parker Parcel) which fronts on Route 154, (small north/south strip) and a larger wetland area in the parcels northeastern corner (CONNDOT).

The wetland area adjacent to Route 154 would have to be crossed to gain access into the side. This wetland area seems to function primarily as a retention area and drainage way for the surrounding property.

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*National Cooperative Highway Research Program Report 187, 1978.

**CONNDOT.

Traveling east across the site from Route 154 there is an upgrade slope which begins at approximately fifty (50) foot elevation (Route 154) and rises to approximately one hundred and fifty (150) feet elevation in the center of the combined parcels, and then downgrade toward the northeast corner to an approximate elevation of fifty-five (55) to sixty (60) feet. As such, drainage west of the knoll flows toward Route 154 and the wetland area there, while drainage east of the knoll flows towards the wetland area located in the northeast corner of the parcel.

After development, the drainage that does flow east to the northeast corner wetland area should not have an adverse impact on the area mainly due to the existence of a large pond located adjacent to the sites eastern boundary, which would benefit from any increased flow.

The site drainage west toward Route 154 passes across Route 154 through a twelve (12) inch culvert. Development of the site in this drainage area would probably necessitate either the replacement of the twelve (12) inch culvert or the on-site use of appropriate stormwater control structures to maintain a rate of runoff similar to the existing rate so as not to overload this culvert.

The slope of this site is its major limitation, assuming adequate depth to ledge is found during test pit exploration. This slope limits the site in suitable building area, drainage (west), and placement of septic systems. Major cuts in grade, if accomplished to minimize the sites steep slope, would require comprehensive erosion and sedimentation control measures.

Summation

The site has good road network access. That is access to Route 154-Route 9. While Route 154 has the capacity to handle additional traffic flow, a traffic control at 154 and an access road would ensure an adequate level of service. The site frontage on Route 154 has good sight clearance distance of some five (500) hundred feet north and south. Any proposed connector road to Springbrook Road would generate traffic flow not compatible with the residential development of the area.

The site has a slope limitation which would require careful placement of structures, septic systems, erosion and sedimentation control measures and stormwater control measures (west). If major regrading is proposed, the same considerations are appropriate.

It is also recommended that an undeveloped buffer strip be required between uses as proposed and any adjacent residential district to minimize nuisance.

XII. SUMMARY

NOTE: This is a very brief summary of the major concerns and recommendations of the Team. You are strongly urged to read the entire report, and to refer back to the specific sections in order to obtain all the information about a certain topic.

TOPOGRAPHY AND SETTING - SECTION II

The two adjacent parcels of land are located in the northwest corner of Old Saybrook. Slopes within the parcel range from gentle to moderate, and the elevation range is from a minimum of 60 above sea level to ±160 feet above sea level. Two small intermittent watercourses drain the parcels.

GEOLOGY - SECTION III

Bedrock and surficial geology maps have been published and are available at the DEP's Natural Resources Center.

Depth to bedrock ranges from zero to probably not much more than 10 feet throughout the parcel.

Most of the site is covered by a glacial sediment called till. Stratified drift is also found overlying bedrock or till along the western boundary of the parcel.

Seasonally wet areas made up of regulated inland-wetland soils parallel the intermittant watercourses.

GEOLOGIC DEVELOPMENT CONCERNS - SECTION IV

Based on soil mapping, surficial geologic mapping, and visual observation, it appears that the major geologic limitations on the site will be (1) areas which have a relatively shallow depth to bedrock (10 feet or less), (2) till-based soils which may have a seasonally high groundwater table and slow percolation rates, and (3) some areas having moderate slopes. These geologic limitations will weigh heaviest on the ability to provide adequate subsurface sewage disposal.

Because of these conditions, it seems likely that the development would be appropriate at a comparatively low density.

Detailed soil testing should be conducted to determine subsurface conditions in order to accurately assess the soils capabilities.

HYDROLOGY - SECTION V

Surface runoff on the site may be divided into three areas shown on the Watershed Boundary Map.

Development of the parcels can be expected to lead to increases in stormwater runoff. The amount of increased runoff will depend largely on the density of the proposed research/executive park, extent of deveopment, amount of vegetation removed, the amount of impervious surfaces created, and the timing of development of each lot.

Estimates of runoff changes likely to occur indicate significant increases. It is strongly recommended that a detailed engineering study of the pre and post development runoff for the parcels, as well as a careful stormwater management plan, be prepared prior to any development.

Close examination of all downstream culverts should be required to insure that flooding problems do not occur. Of particular concern will be the 12" pipe passing under Route 154.

WATER SUPPLY - SECTION VI

At the present time, public water supply is not available for this area. If a public water supply is not extended to the park, then the underlying bedrock would appear to be the only suitable aquifer to tap.

Consideration could be given to screening prospective users of the park by local and state officials to determine the type of wastes they may generate and thereby avoid any threats to the water supply.

Serious consideration should be given to providing either public water or public sewers (or both). Without such services, the overall density of the development becomes critical. With both on-site wells and subsurface sewage systems are utilized large sites should be provided in order to reduce the chance of well pollution and the degradation of water quality and to protect the public health.

SEWAGE DISPOSAL - SECTION VII

The Town does not have public sewerage facilities so the site would be served by subsurface sewage disposal.

Based on visual observation and the soil mapping data, it appears that the land from around the central part towards the west-northwest should be feasible for sewage disposal purposes. The main concern would be with the degree and size of stones which may be present.

Areas should be adequately tested to determine the depth of soil overlying any ledge rock or the extent of any large stones.

Important questions are: (1) overall density, (2) size and number of persons projected for individual buildings, and (3) what utilities would and would not be available.

SOILS - SECTION VIII

Soils on the site are primarily fine sandy loams derived from glacial till, also glacial outwash derived soils and regulated inland-wetland soils are found on the site.

Refer to the Soils Map and Soils Limitations Chart for their distribution and limitations.

Development of the site will require careful planning for driveways, parking lots, building and septic systems. Extensive grading will be necessary which will increase the erosion hazard during construction. A detailed Soil Erosion and Sediment Control Plan should be prepared to provide proper control during and after construction. Technical assistance is available upon request from the Middlesex County Soil and Water Conservation District.

VEGETATION - SECTION IX

The vegetation of this parcel is representative of the central hardwood forest that occurs in southern Connecticut. Three vegetative types are found: (1) mixed hardwood type, (2) hardwood swamp type, and (3) old field type.

The forested parcel offers various aesthetic amentities that may attract corporations to the site. There is the possibility of leaving much of the forest land intact so that a continuous forest remains. A continuous forest would offer good screening effect to neighbors of the park.

Large, healthy trees should be retained where possible. Hazardous trees should be removed prior to construction.

The maintenance of healthy and vigorous trees should be a major concern in the development of this tract. Proper management such as thinning, removal of unhealthy trees and underplantings should take place.

WILDLIFE HABITAT - SECTION X

This wooded area now provides good habitat for wildlife, as the land is developed the quality of the habitat will be reduced. Some species will leave, some will adapt, and others may be attracted to the area.

Certain recommendations may be followed to help lessen the impact on wildlife in the area. These include leaving trees and shrubs and landscaping with plantings attractive to wildlife.

When specific information is known about the development, a wildlife biologist should be consulted regarding the feasibility, design and management of a "wildlife sanctuary."

PLANNING CONCERNS - SECTION XI

The use of the land for a proposed research/executive park is consistent with the Old Saybrook 1970 Plan of Development and the 1975 Regional Plan of Development.

The total number of trips per day generated from a fully developed 46 acre site could be substantial. Route 154 has the capacity to handle additional traffic flow with the use of traffic controls.

Any proposed connector road adjoining Route 154 to Springbrook Road would generate traffic flow not compatible with the residential development in the area.

The parcel's 400 foot frontage on Route 154 has good north/south sight clearance of about 500 feet.

The site has good road network access.

It is recommended that an undeveloped buffer strip be required between the park and any adjacent residential areas.

"The growing population and expanding economy of Connecticut have had a profound impact upon the life sustaining natural environment. The air, water, land and other natural resources taken for granted since the settlement of Connecticut are now recognized as finite and precious."

Connecticut General Assembly, P.A. 872

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.