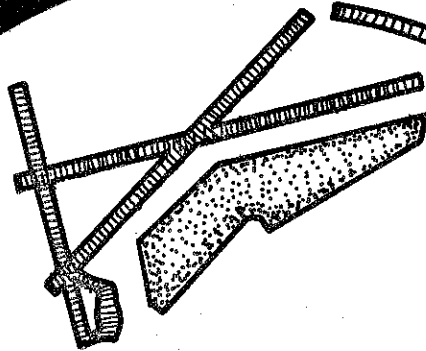


**environmental review team report**



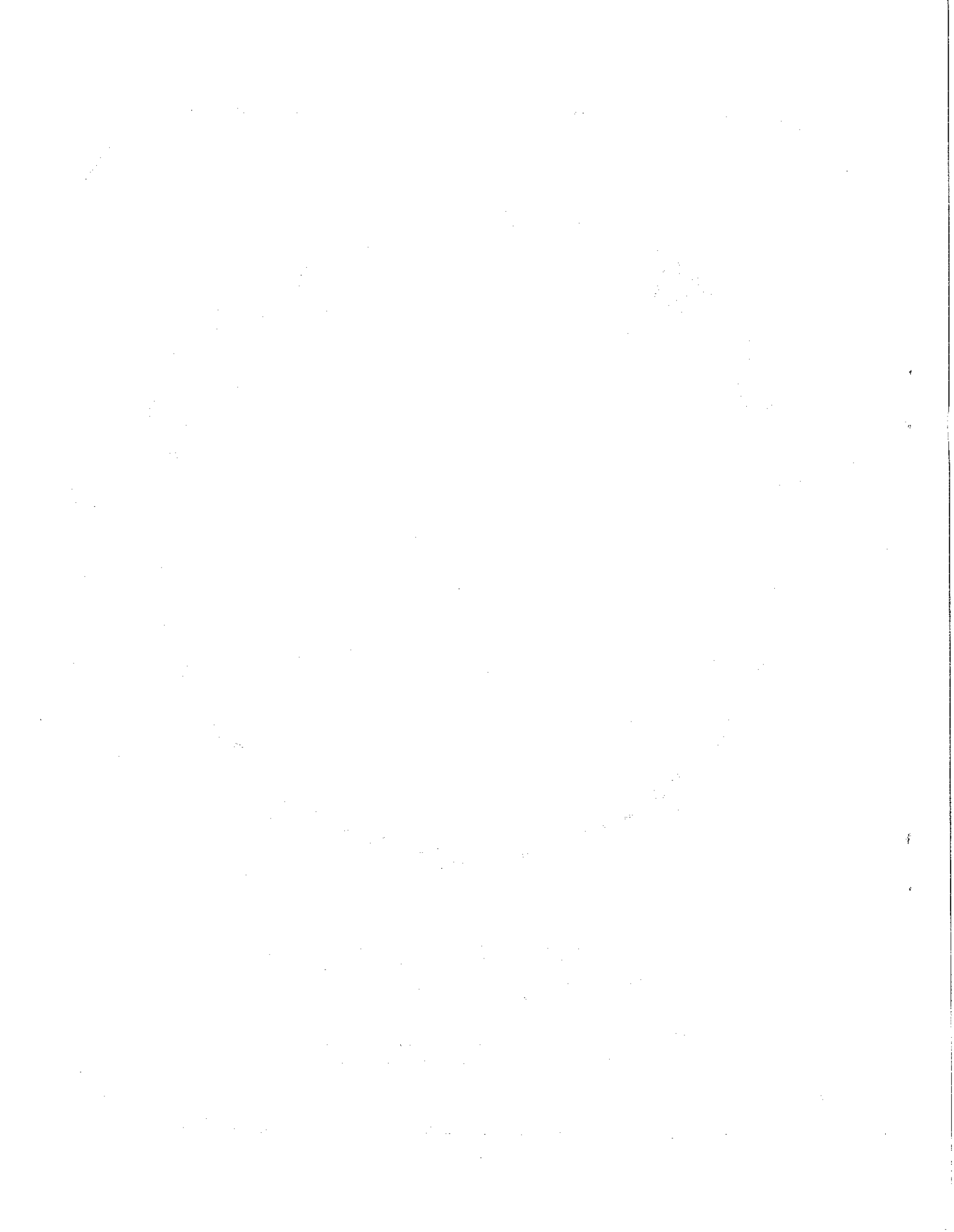
**WINDHAM  
INDUSTRIAL  
PARK • WINDHAM,  
CONNECTICUT**



**RC & D**

**EASTERN CONNECTICUT  
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT**

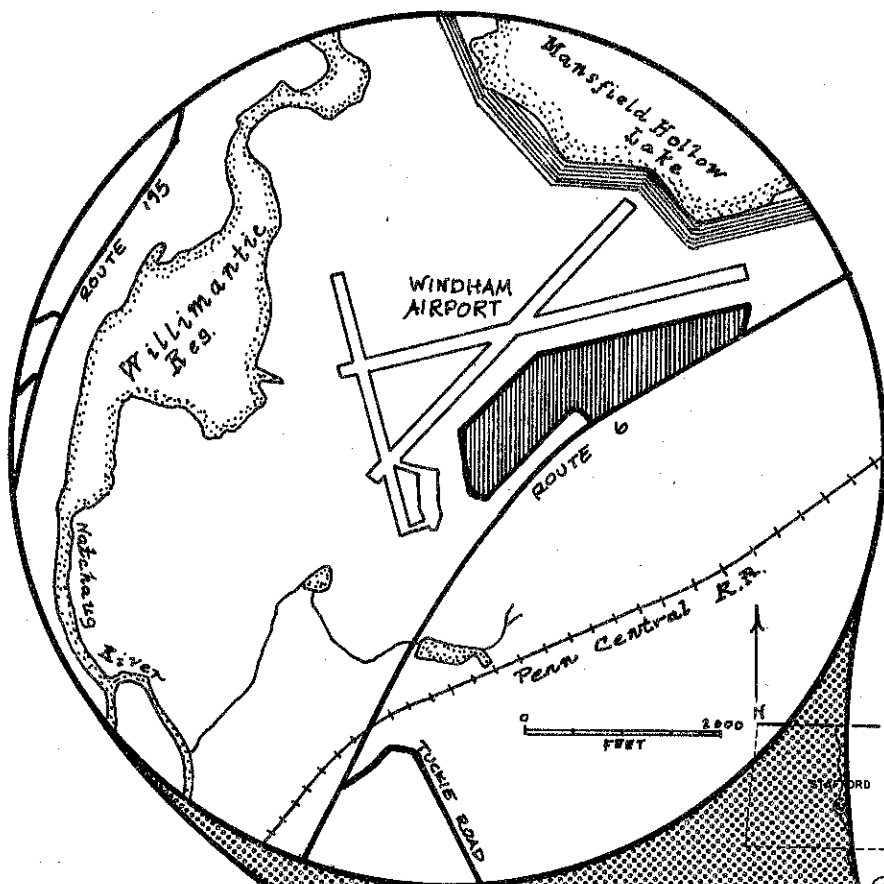
**ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE,  
SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES**



ENVIRONMENTAL REVIEW TEAM REPORT  
ON  
WINDHAM INDUSTRIAL PARK  
WINDHAM, CONNECTICUT  
FEBRUARY, 1976

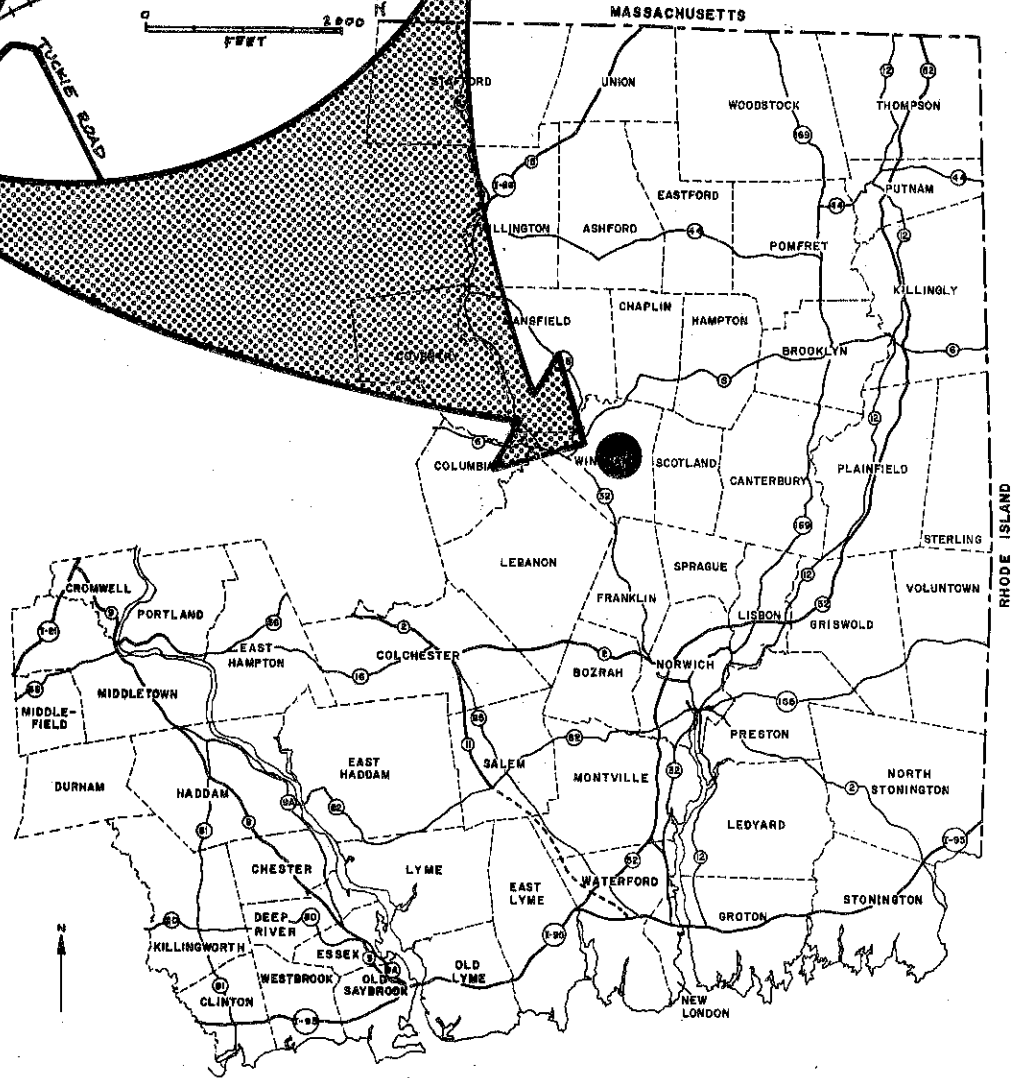
*The preparation of this report was assisted  
by a grant under Title 1, Section 107(a)4 of  
the Housing and Community Development Act  
of 1974, 24 CFR, Part 570, Section 570.406.*

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

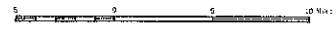


# LOCATION OF STUDY SITE

WINDHAM INDUSTRIAL PARK  
WINDHAM, CONNECTICUT



EASTERN CONNECTICUT  
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT



ENVIRONMENTAL REVIEW TEAM REPORT  
ON  
WINDHAM INDUSTRIAL PARK  
WINDHAM, CONNECTICUT

This report is an outgrowth of a request from the First Selectman of the Town of Windham to the Windham County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Project Committee for their consideration and approval as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA) Soil Conservation Service (SCS). Reproductions of the soil survey, a table of soils limitations for certain land uses, and a topographic map showing the proposed industrial park property were forwarded to all Team members prior to their field review of the site.

The Team that field-checked the property consisted of the following personnel: Al Weeks, District Conservationist, SCS; Marc Crouch, Soil Scientist, SCS; Robert Miller, Geologist, Connecticut Department of Environmental Protection (DEP); George Cloutier, Forester, DEP; David Miller, Climatologist, University of Connecticut Extension Service; Malcolm Shute, Sanitarian, Connecticut Department of Health; Lester Barber, Regional Planner, Windham Regional Planning Agency; Linda Simkanin, ERT Coordinator, Eastern Connecticut RC&D Project.

The Team met and field-reviewed the site on Thursday, January 8, 1976. Reports from each Team member were sent to the ERT Coordinator for review and summarization.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Windham. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

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

If you require any additional information, please contact: Miss Linda M. Simkanin, Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.

## INTRODUCTION

The Town of Windham proposes to develop as an industrial park a 44-acre tract of land located immediately south and adjacent to the Windham Airport. Much of the southernmost portion of the property fronts along U.S. Route 6. The Willimantic Reservoir is located to the northwest of the site, the Mansfield Hollow Dam to the northeast, with some single-family homes located off Route 6 in the vicinity of the site. The 44 acres are currently zoned for industry.

The Environmental Review Team field-checked the site relative to the proposal to create an industrial park. As there is no detailed site plan available for the property, prior to the field-review, the Team members examined a general site plan and report on the *Airport Industrial Park* recently prepared by Cahn Engineers for the Town of Windham.

That plan found the site suitable for the proposed industrial development, cited an avigation easement which exists on the land, indicated that approximately 25 acres could be sold for industrial sites, and suggested that the announcement of a construction schedule for I-84 would have a significant influence on the land sales revenues from this site.

This ERT report will describe the natural characteristics of the site including topography, geology, soils, and forest cover. Consideration will be given to the compatibility and suitability of the development relative to the natural resource base, as well as to the existing development pattern including roads and utilities. Comments or recommendations made within this report are presented for consideration by the town in the preparation and review of the individual industrial site development plans, and should not be construed as mandatory or regulatory in nature.

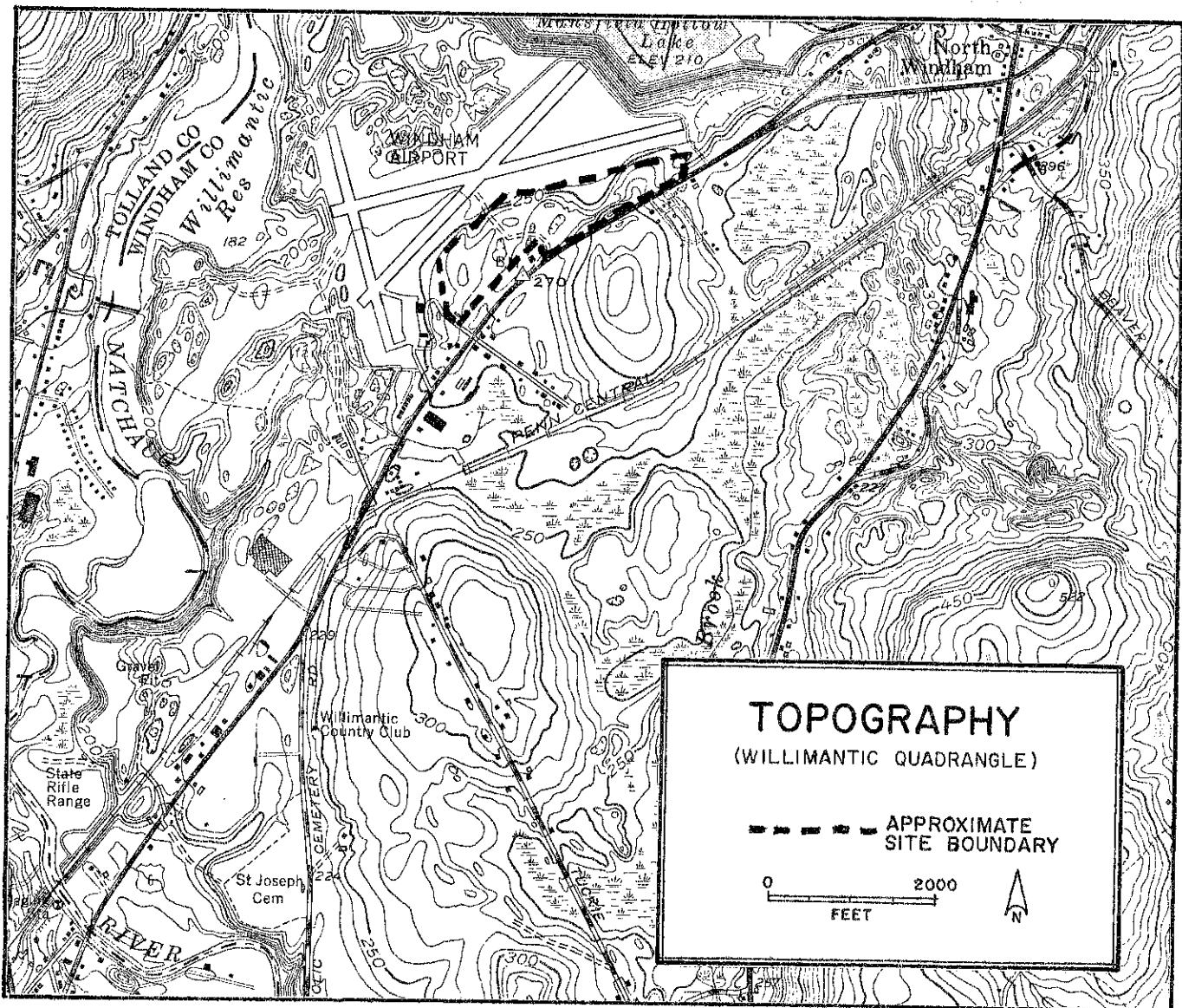
# EVALUATION

## TOPOGRAPHY AND GEOLOGY

The proposed Windham Industrial Park is located north of the City of Willimantic on U.S. Route 6. About 48% of the site is a sand and gravel mixed area with ledge or bedrock exposed in isolated areas. The remaining 52% is mostly wooded. The eastern half of the site offers the greatest variety in topography with several small depression areas and steep slopes evident. The exposure is southwest which is subject to sun and winds and which contributes to the droughty conditions of the soils.

The proposed Windham Industrial Park site is underlain by two types of bedrock; Willimantic gneiss and a hornblende gneiss.

The Willimantic gneiss is an igneous rock which is light-colored with a medium to coarse-grained texture. Its composition is basically one of felsic albite, alaskite, or oligoclase quartz monzonite. It may physically be distinguished from the hornblende gneiss in that it weathers either in long resistant ledges or gentle slopes of fragmented material of the bedrock. Observations of



this material are evident on the southwest corner of the proposed site and in an excavation bank in the northeast corner of the site.

The hornblende gneiss is black or very dark in color with a medium-grained texture. It is metasedimentary in nature. As its name implies the main composition is of hornblende. Mafic amphibolite biotite schist and felsic biotite gneiss may in some places be found along with it. The best outcroppings of these rocks were found on the south side of the excavation pit located in the northwest corner of the proposed site. Neither of these rock types hold any economic importance other than possible use as fill.

## SOILS

A detailed soils map of the site and a soils limitations chart are provided in the Appendix of this report. As the map is an enlargement from the original 1320'/inch scale to 660'/inch scale, the soil boundary lines shown should not be viewed as absolute boundaries but rather as guidelines to the distribution of soil types on the property. The soils map, along with the Soil Interpretations report, Windham County Soil and Water Conservation District (USDA, SCS, 1975), can serve as an educational tool regarding the identification and interpretation of soils.

The soils limitations chart for certain land uses which is found in the Appendix of this report, provides useful information concerning each soil type found on the industrial park site. An explanation of the numbered ratings for particular land uses is provided on the last page of the Appendix. In general, the greatest limiting factors to the industrial development could be slope. With careful design and actual placement of structures and paved surfaces, steep slope areas can be used to aesthetic advantage within the industrial park development.

About 28% of the potentially developable land is soil 213C, which consists mainly of two soils, Hinckley and Windsor, which occur in patterns too intricate to separate in mapping. The Hinckley soils which constitute about 50% of this complex, are excessively well-drained and have developed in sandy, gravelly and cobbly water deposits. These deposits are normally deeper than 10 feet, are located on undulating to rolling terrace topography above the present overflow of large streams. They have rapid to very rapid permeability in the subsoil. The water table is below 40 inches during most of the year. Most use problems are related to texture, droughtiness and rapid to very rapid permeability.

The remaining 50% of this complex consists of sandy soils, mainly Windsor, Merrimac, and Agawam. The topography is characterized by undulating to rolling terrace ridges and depressions, with the sandy, textured soils occurring in the depressions.

About 48% of the area mapped is soil ML2, cut and fill. As noted on the soils limitations chart, this land will have variable conditions from exposed bedrock to poorly and very poorly drained soils with a high water table during most of the year. Areas with severe limitations are small and with proper grading should be made suitable for its planned use as an industrial development. Lack of topsoil for this area could be a problem in establishing a good vegetative cover.



Because of the slope of the land both diversions and grassed waterways or outlets will be needed. Special seed mixtures will be needed for the grassed waterways or outlets. Extensive or major grading planned should be preceded by proper soil testing for ledge or bedrock. When grading the topsoil, six to ten inches deep should be saved for spreading over areas not used for roads, parking lots and buildings. Because of the southwest exposure and the natural droughtiness of the soil, establishing and maintaining suitable cover will take special emphasis. Because of the adjacent Windham Airport, plant covers low in wildlife value should be considered. The bearing capacity of the substratum appears adequate for the normal loads associated with building construction.

## DRAINAGE

With the apparent availability of public water and sewers to the proposed industrial park site, the only remaining problem is that of the increased surface water and its drainage. It appears that the surface drainage will be deposited in a pond on the north side of the Windham Airport which is in the same ground-water aquifer as the Willimantic Water Supply Reservoir. Therefore it is possible that whatever runs off this area will eventually end up in the water supply reservoir. A study now being conducted by Griswald and Fuss to determine the groundwater leachate movement from the landfill and pond into the reservoir should answer this concern. If it is determined that the pond does leach into the reservoir, then precautions will have to be taken to avoid or remove any toxic materials running off the industrial park site as any additional runoff could increase the hydraulic head and add to the possibility of the pond water entering the Willimantic Reservoir.

At present a 15 inch diameter perforated underdrain concrete pipe is used for drainage of the northeastern section of the adjacent airport runways. The pipe extends in a northerly direction and empties into the pond located between the Windham sanitary landfill and the reservoir. Aside from the surface water removal problem discussed above, the site exhibited no apparent hydrogeologic problems.

The drainage plan should include the handling of runoff from the entire area including roofs, parking lots, and roads as it is doubtful that the present airport drainage is adequate to handle the added drainage from the industrial park. Urban Hydrology for Small Watersheds is available through the local Soil and Water Conservation District. This technical release can be used in designing for land use change such as urbanization in a watershed when figuring runoff and peak rates of discharge.

During construction of portions of the industrial park, the developer should consider both temporary and permanent erosion control practices. The Erosion and Sediment Control Handbook for Connecticut outlines the type, purpose and design procedures for many of these practices. These handbooks are available through the local Soil and Water Conservation Districts. With proper planning, contamination from salts and other contaminants can be held to a minimum and should not contaminate the Natchaug River so its use for public water supply would be jeopardized.

## FORESTRY

The forest land covering this site is a sapling-pole stand of mixed hardwoods and pine. The area has been repeatedly burned over in the past. Stand composition is mostly low grade oak suitable for fuel wood. Removal of this stand will have no adverse effect on the forest economy of the region.

Several thousand acres of White Pine occupy the adjacent river valley and upland terraces. White Pine is one of our most valuable forest species and grows in quantity on only a very small percentage of our soil types. It is our most productive species in terms of timber products and also is one of the most aesthetically pleasing types. Most of our intensive forest recreation activities are centered around this specie. Eastern White Pine (*Pinus Strobus*) is a "sensitive" species subject to off-site air pollution damage from the following common industrial pollutants:

sulfur dioxide; hydrogen fluoride; ozone; oxides of nitrogen; chlorine; mercury vapor, etc...

Arnot Bristly Locust which grows to 6 to 8 feet does nicely in mined areas where lawns, buildings and parking lots are not planned. This shrub (actually is a legume) forms thickets by underground root stocks, is acid tolerant. It does have some wildlife value which might be a detriment to the adjoining airport. Crown vetch is another legume that does nicely on droughty areas. Both legumes are very attractive.

Prior to any development, the wood should be offered to the public for utilization as fuel wood. Any reduction in this raw material will reduce man hours needed in removing and disposal during development stage, provide some energy saving and save on waste disposal space. Landscaping for beautification purposes should be done with species suitable for the soil types present. Consult with the University Extension Service and other knowledgeable people on this.

The proposed industrial site would be an ideal location for a low polluting, low energy using woods based industry. Transportation facilities are excellent; there is a surplus of semiskilled labor in the area and the area is in the center of a highly populated consumer region. In the three adjacent counties of Windham, Tolland and New London, a 1972 forest inventory by the United States Forest Service shows there is approximately 672,000 acres of commercial forest land. The volume of saw timber sized stands is estimated to be 950 million board feet: 725 million board feet are in the Oak-Hickory type; 241 million board feet are in the Maple, Beech, Birch Northern hardwood type. The area could comfortably support a wood using industry in the medium size (30-40 million board feet annual requirements). Industries of this type include flooring, furniture, paneling and specialty hardwood products.

## CLIMATOLOGY

The proposed Industrial Park itself will have little effect on the climate nor will the climate have much effect on the park except in terms of winter heating buildings on the site as noted below.

Air pollution should not be a problem since the site is northeast of Willimantic and the prevailing winds are westerly. Therefore, any pollution generated at the site will probably dissipate before reaching a settled area. The small village of North Windham may be an exception to this and have some problem if heavy air pollution levels are generated at the site. The exposed nature of the site will facilitate the mixing and dispersion of any air pollutants generated at the site.

The exposure to winter winds blowing across the airport will cause the winter fuel demand of buildings on the site to be significantly higher than a site protected from winter winds. There is some evidence in the research literature that there may be as high as 1/3 greater fuel usage on wind exposed sites. A good windbreak (artificial fence or natural trees) along the property line between the airport and the site would reduce this exposure considerable.

## SERVICES TO SUPPORT DEVELOPMENT

The site is convenient to a complete range of urban services, perhaps the most complete of any location in the region. The North Windham fire department is only a mile to the north on Route 6. An interchange of I-84 lies less than one-half mile to the south. The Windham Airport is adjacent to the site.

Route 6 has been developing as an automobile oriented commercial service area for some time. As industrial activity increases a commensurate increase in related commercial service enterprises can be expected. Some thought should be given to protecting the land directly across U.S. Route 6. It is much more fragile than this site due to the extensive wetland area (Potash Brook) which drains it. If the industrial park is developed, it is likely that unless that particular area is carefully controlled, supporting industries and commercial establishments may spread along this section of Route 6 and adversely affect that wetland area.

The proposed park is fronted by Route 6 which is the major arterial highway serving much of the commercial, industrial, and high density residential development in the region. It is perfectly adequate in design and capacity to accommodate the type of industrial uses proposed for the industrial park site.

The park does abut a section of the highway having poor vertical and horizontal alignment. Access to the park from Route 6 should be as limited as physical design of the park can make possible. Ideally the park should be limited to one entrance onto Route 6 with all lots within the park having access to the interior park road(s) rather than with individual entrances onto Route 6. One road to all sections of the industrial park should be developed. On-site, only roads to the town garage and town sanitary landfill currently exist.

It was reported that site development probably would not occur until Interstate 84 has been completed. Traffic patterns should be studied to determine potential problems, such as large numbers of people in the city vicinity driving to work at the industrial site, truck sizes, entry and exiting, and the transportation of materials, goods, wastes and frequency.

The site is well within the area proposed for servicing with public water and sewers in both local and regional water and sewer plans. Services are now adjacent to the site and can easily be extended to provide complete service to the park.

#### WATER SUPPLY

The site can be serviced by Willimantic Water Works. Depending on the type of industry and fire protection required, service may need expansion. High water users should consult with the local water works for adequacy of the needed supply. The water company should work closely with the industrial park developers to insure adequate future supply is available for expansion.

#### WASTE DISPOSAL

Municipal sewers are planned to be provided for the industry. The anticipated quantity and quality of the wastes emitted from each proposed industry should be reviewed to insure that adequate treatment can be made. Specific approval of the industry should be obtained from the Department of Environmental Protection and the Willimantic Sewer Authority with regards to types and quantities of waste products to be treated. Approval of proposed sewer locations and size must be obtained from the State Department of Health since the water supply reservoir is in close proximity. Consideration should be given to the types of solid wastes to be generated, and where and how they will be disposed of, or if recycling is possible. Consideration should also be given to the effect of redirected surface or storm water onto other watersheds.

#### COMPATIBILITY OF SURROUNDING LAND USES

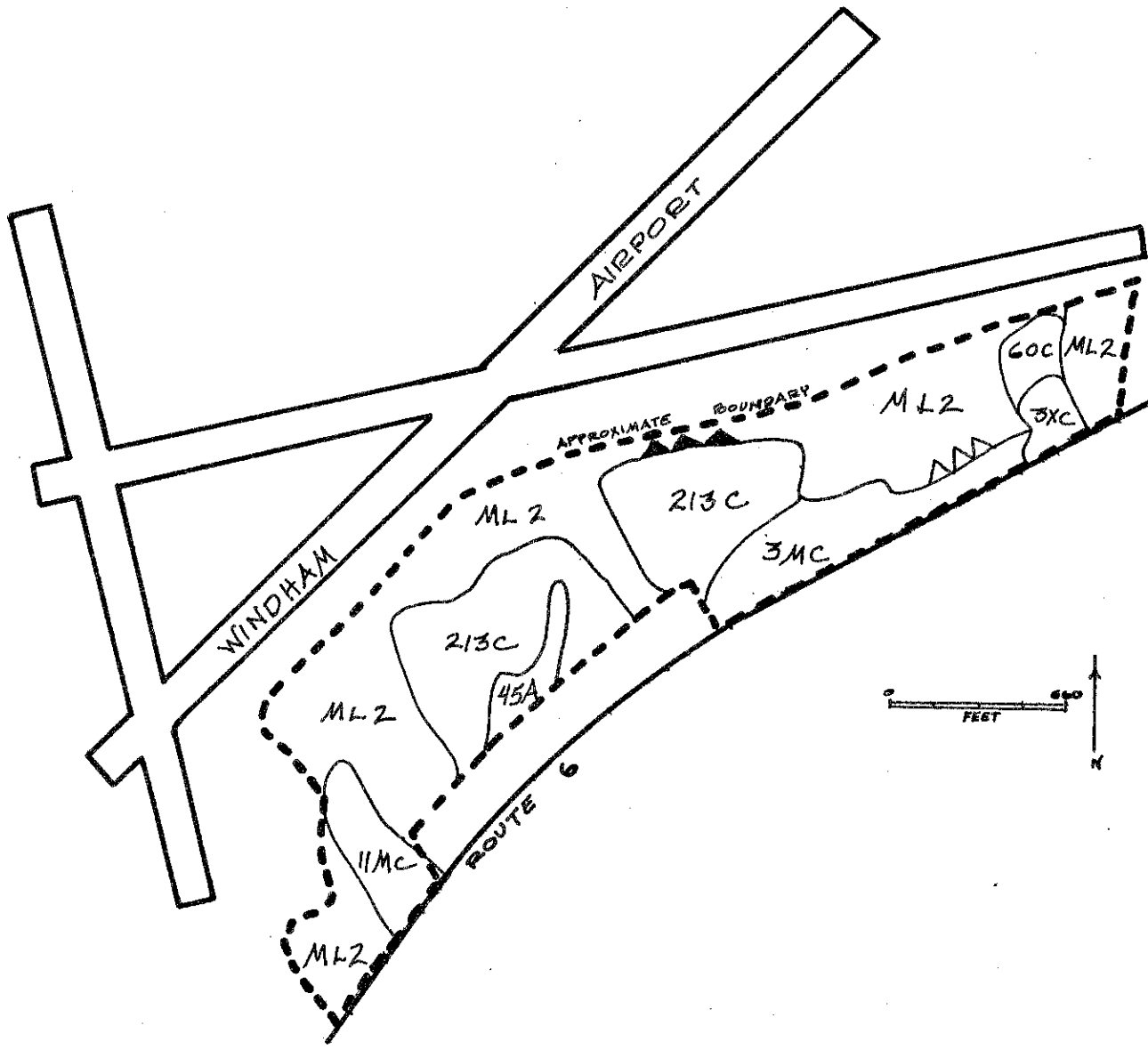
Route 6 from the City line to the Chaplin town line has been developing for many years as a commercial-industrial area. While considerable residential construction is evident from some years ago, most recent construction has been exclusively commercial and industrial. Existing residential use can be expected to be phased out as the area continues to develop. Given the high speed, high volume arterial nature of Route 6 and the presence of the airport, low density single family use is inappropriate to the general area. Reasonable setback and landscaping requirements should be adequate to protect residential uses at the edge of the commercial-industrial district from any adverse impact.

#### ALTERNATIVE LAND USES FOR THE SITE

The environs of the airport have been identified in the Windham Regional Planning Agency's land use plan as a major regional industrial development node. The Character of the area's past developmental history and the presence of a unique number of prerequisite service facilities suggests that the location is ideally suited to industrial development. The region would be poorly served if less intensive uses, in the form of residential development or light commercial enterprises were to preempt the site. The proposed industrial park could serve as a catalyst for similar development on adjacent locations

APPENDIX

SOIL MAP  
WINDHAM INDUSTRIAL PARK  
WINDHAM, CONNECTICUT



The map is an enlargement from the original 1/320" scale to 1/660" scale.

Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE, Soil Conservation Service.

ADVANCE COPY, SUBJECT TO CHANGE

FEBRUARY 1976

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Natural Soil Group	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*				Small Industrial Buildings
						On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping	
Hinckley	A-1b	60C	1.5	3.4	Slope	2	2	2	2	2, 3
Hinckley-Windsor Complex	A-1b	213C	12.5	28.4	Slope	2	2	2	2	2, 3
Tisbury	A-2	45A	1	2.3	Wetness	3	3	2	1	3
Canton	B-1b	3XC	1	2.3	Stoniness, Slope	2	2	2	2	3
Canton and Charlestown	B-1c	3MC	4	9.0	Stoniness	3	3	2	3	3
Gloucester	B-1d	11MC	3	6.8	Stoniness	3	3	2	3	3
Made Land (Cut and fill)	--	ML2	21	47.8	Note: On-site investigation required to determine soil limitations of the made soil.					
Total:			44	100.0						

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

(See back of this page for further explanation of these limitations.)

## SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost.

### Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

### Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having higher than average outlay when such areas are compared with areas rated as having slight limitations.

### Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.