environmental review team report

RC&D

EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

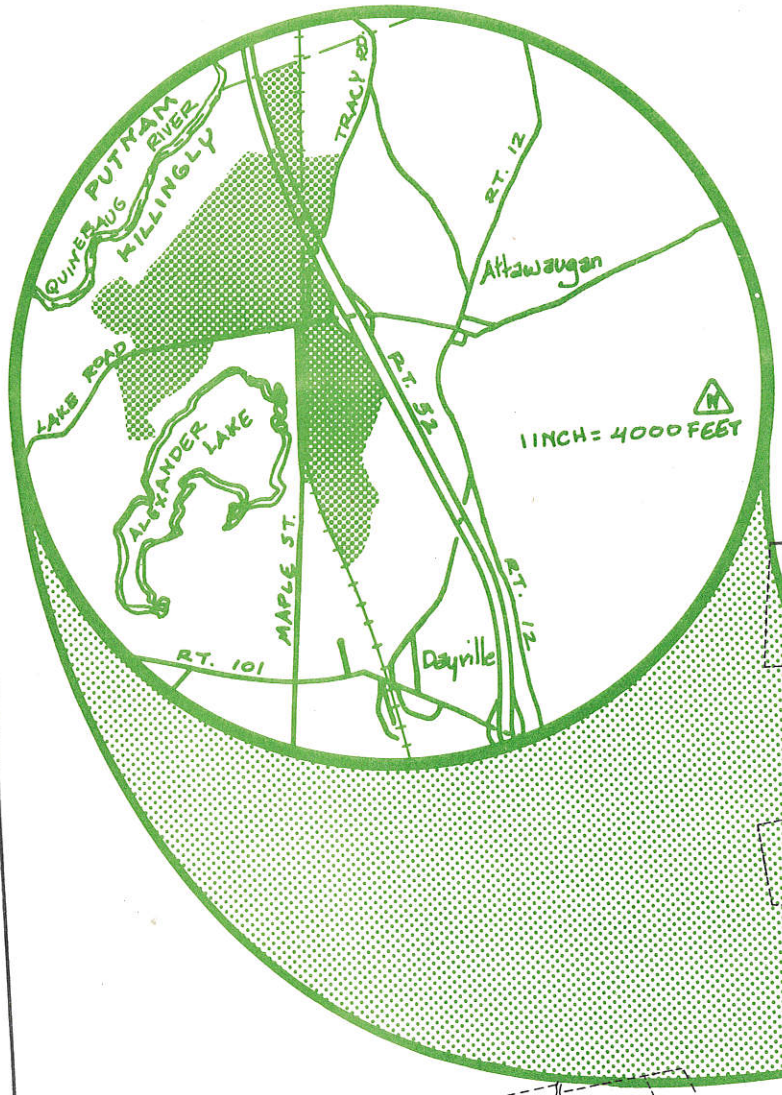
ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE,
SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES

ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
PROPOSED INDUSTRIAL PARK
KILLINGLY, CONNECTICUT
MARCH, 1975

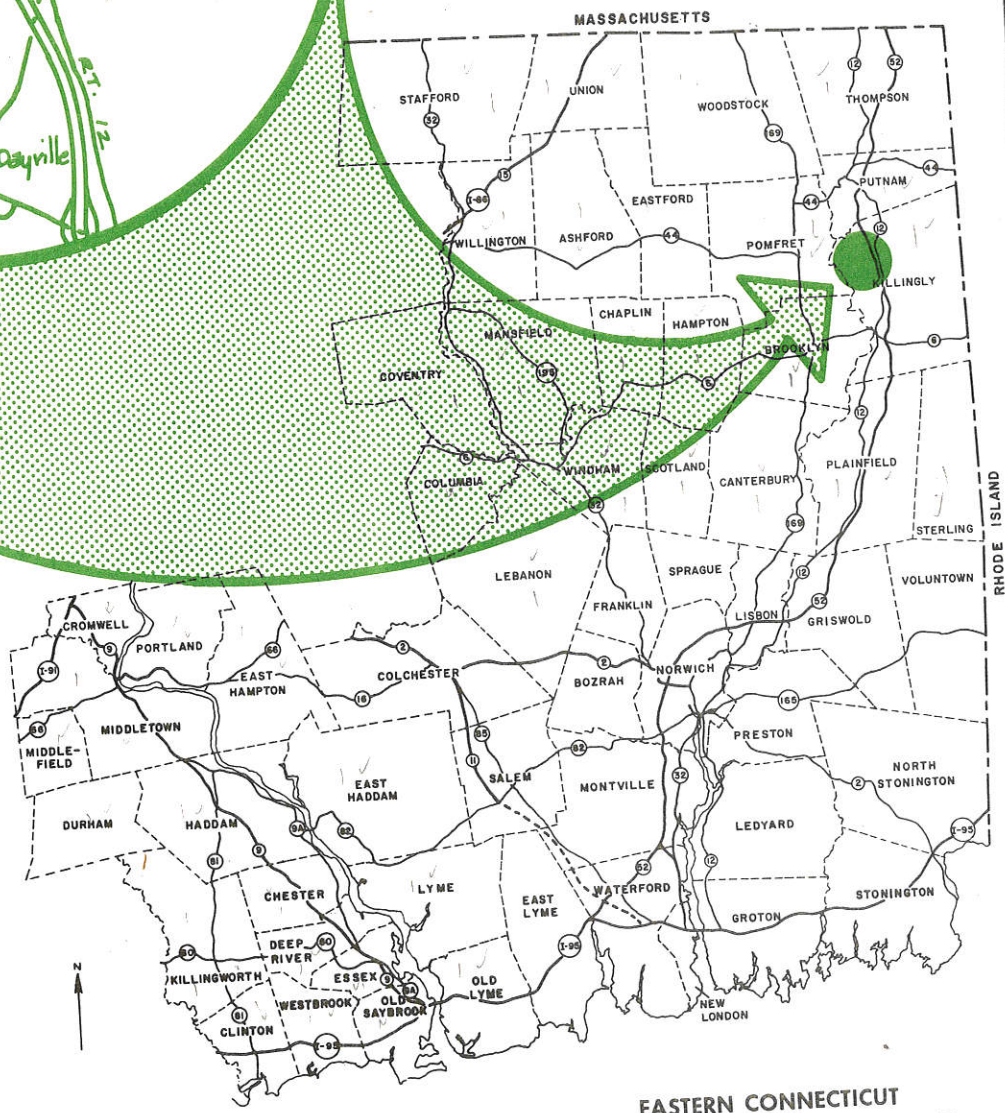
Preparation of this report has been, in part, assisted by a grant from the U.S. Economic Development Administration with the financial support of the Regional Planning Agencies of Eastern Connecticut administered by the Eastern Connecticut Development Council.

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

LOCATION OF STUDY SITE



PROPOSED INDUSTRIAL PARK
KILLINGLY, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
PROPOSED INDUSTRIAL PARK
KILLINGLY, CONNECTICUT

This report is an outgrowth of a request from the Town of Killingly, with the approval of the landowners, to the Windham County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Executive Council for their consideration and approval as a project measure. The request has been approved and the measure reviewed by the Environmental Review Team.

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

The Team that reviewed the proposed development consisted of the following personnel: Albion Weeks, District Conservationist, Soil Conservation Service (SCS); Dean Rector, Soil Scientist, SCS; Edwin Minnick, Engineer, SCS; Dan Meade, Geologist/Hydrologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); George Cloutier, Forester, DEP; Joseph Piza, Fisheries Biologist, DEP; Malcolm C. Shute, Jr., Thomas Furgalack, Sanitarians, State of Connecticut Department of Health; David Miller, Climatologist, Connecticut Cooperative Extension Service; Charles Boster, Pamela Stein, Planners, Northeastern Connecticut Regional Planning Agency; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on January 16, 1975. Reports from each Team member were sent to the Team Coordinator for review and summarization.

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

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

If you require any additional information, please contact: Miss Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

INTRODUCTION

The Town of Killingly is in the process of preparing a grant application for site improvements in the Killingly Industrial Park. In conjunction with the application, the Town has requested assistance in examining the possible physical environmental impacts of industrial use of this area.

The entire industrial area proposed in the Killingly Plan of Development encompasses over 300 acres along Lake Road, Maple Street, and Track Road. The initial area to be developed is north of Lake Road. This includes cornfields and some wooded uplands to the east.

Alexander's Lake, the Quinebaug River, and the Five Mile River are the most prominent natural features in the vicinity of the industrial site. Protecting their water quality will need to be a prime consideration in plans for the industrial park. Also of concern should be the many residential homes nearby, particularly around Alexander's Lake.

The majority of this site is physically well-suited for almost any type of development. Many factors, such as highway and rail access, make the site particularly desirable for industrial use. This report will describe the existing natural resources on the site and then evaluate the various aspects of development and how they may affect or be affected by the resources. Comments or recommendations are offered for consideration by the town in the preparation and review of development plans, but should not be construed as mandatory or regulatory in nature.

EVALUATION

EXISTING RESOURCES ON THE SITE

The proposed industrial area encompasses over 300 acres of land, the center of which is approximately 1.7 miles north-northwest of Dayville. As seen on the Topography map on the opposite page, the property is traversed by Maple Street, Route 52, Tracy Road, Attawaugan Crossing Road, Lake Road, and the Penn Central Railroad (now known as USRA line 678). The area also lies between the Quinebaug and Five Mile Rivers. At the site the Quinebaug River has a contributing drainage area in excess of 370 square miles and the Five Mile River has one of 56 square miles.

Topography. Topographically, the area can be divided into two regions: relatively flat terraces along the rivers, underlain by sands and gravels deposited by the meltwater streams of glaciers, and the comparatively steep-sided, drumlin-like hill located north of Lake Road. The terrace area on the western side of the site, which is the area intended for initial development, is only slightly rolling with most slopes less than 2%. In the terrace area east of Maple Street, where collapse structures and ice crevasse fillings are common,* slopes are varied and steeper. Slopes drop steeply along both rivers to the floodplains. The drumlin-like hill exhibits slopes up to 30%.

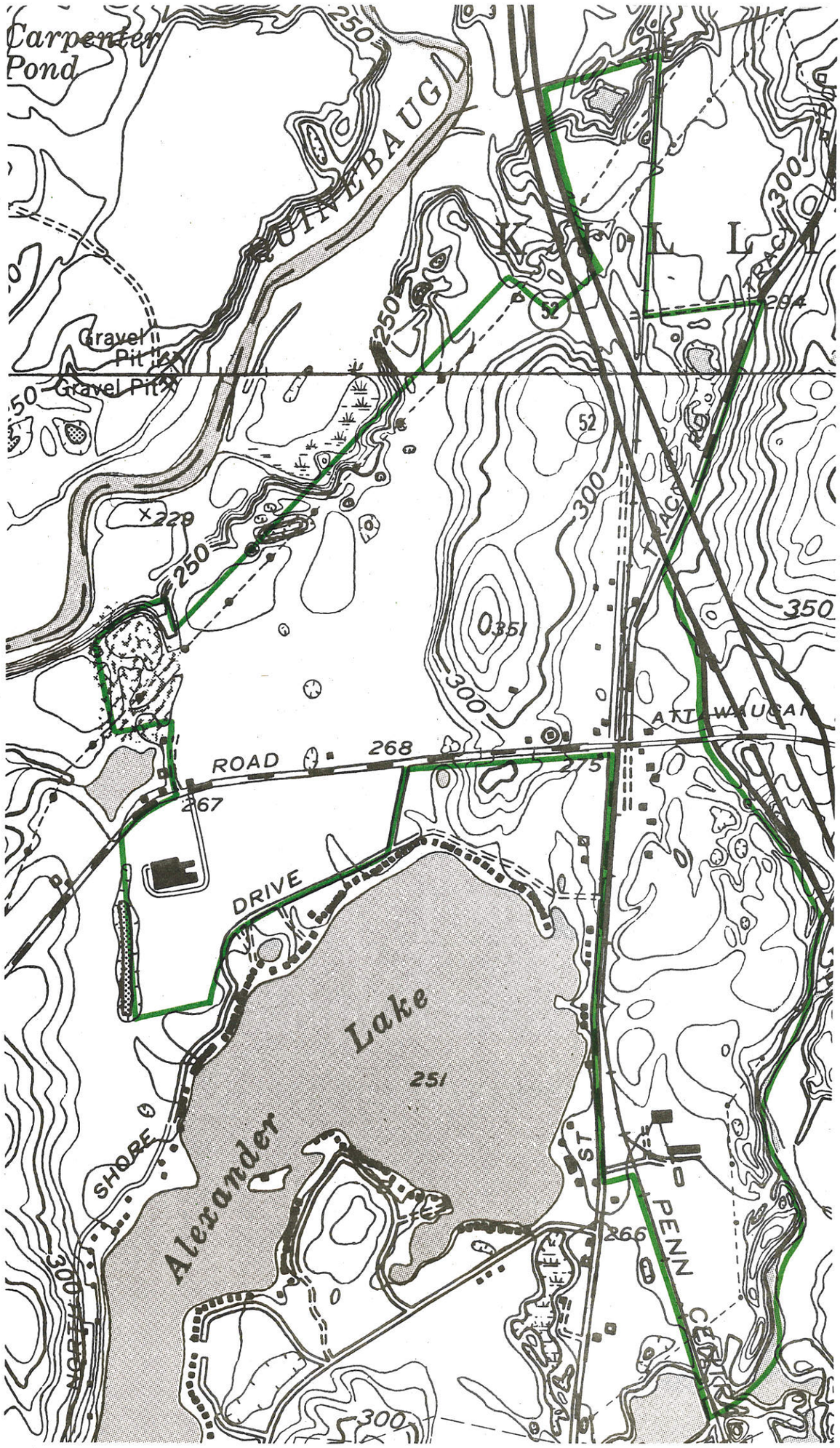
Bedrock and Surficial Geology. The bedrock underlying the site is crystalline rock of metamorphic origin. Mapped as the Quinebaug Formation, the rocks are mainly schists and gneiss and have been subgrouped into various members. Outcrops are generally confined to the central hill and thus bedrock should be of little overall consequence to development of this site.

Overlying the bedrock, the surficial (unconsolidated) materials can be identified as either stratified sands and gravels or till. The Surficial Geology map shows the distribution for that portion of the site within the Danielson Quadrangle. The stratified materials, consisting mainly of varying concentrations of silts, sands, and gravels are found in the flatter areas and may range from less than 5 to greater than 200 feet in thickness. The top 5 to 20 feet of material is a coarse grained cap composed of gravels and coarse sands and is underlain by a variable thickness of fines, ranging from clays to fine sands. The eastern extremities of the stratified drift terrace are an exception as materials there range from sands to boulder gravels. The drumlin-like hill is veneered with a layer of till, thin on the flanks and thick on top. The till is a heterogeneous mixture of material sizes and shapes. Particles are generally angular and may range from microscopic to boulders in size. They are a product of erosion and deposition by ice, without benefit of sorting by a liquid media.

Hydrology. The site is well above any flowing surface water bodies and therefore is not floodprone. Infiltration of rainwater should be excellent in areas underlain by sand and gravel and fair to poor in the till region. Similar to infiltration rates in the two types of materials, hydraulic conductivities should also be high in the stratified drifts and low in the tills. Therefore one would

* Collapse structures resulted from downhill sliding of rocks under the influence of gravity to produce small folds. An ice crevasse is a nearly vertical fissure in a glacier.

TOPOGRAPHY



APPROXIMATE BOUNDARY OF PROPOSED INDUSTRIAL PARK

1 INCH = 1000 FEET

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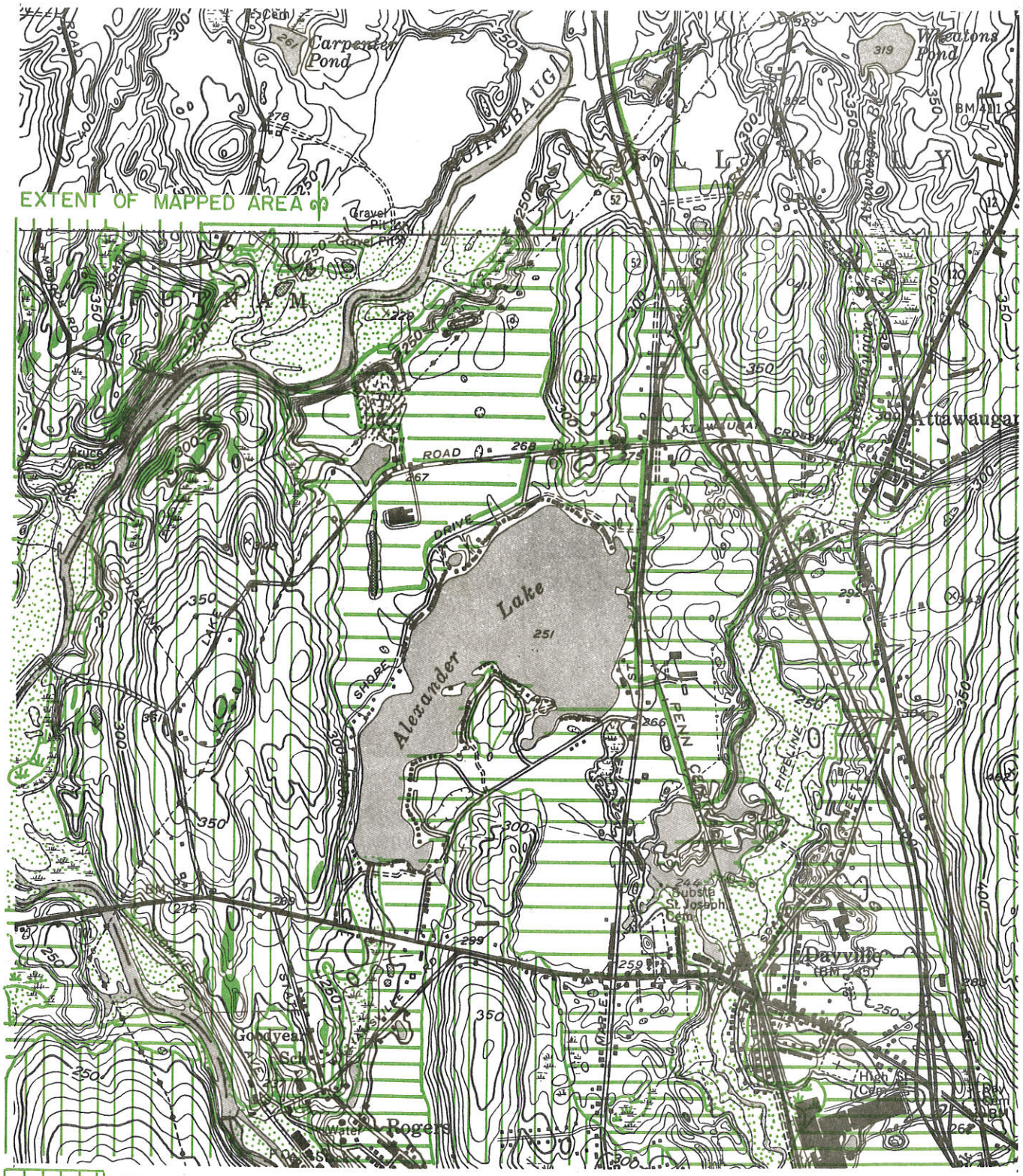
SURFICIAL GEOLOGY



not expect to encounter high water table conditions throughout most of the flat area and would probably find seasonal high water in the till areas.

Inspection of existing and available boring logs for the immediate site do not give favorable indications of locating a large supply of subsurface water. The materials below the water table are generally fine grained and do not lend themselves readily to development by large capacity screened wells.

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

The soils on this site can be grouped into 3 natural soil groups: A, terrace soils over sands and gravels; B, upland soils over friable to firm glacial till; and D, upland soils, shallow to bedrock. The terrace soils encompass over three-fourths of the site (78.9%). All of these soils are underlain by water-deposited beds of sand and gravel. The excessively drained terrace soils (67B, 60C, 60D, 213C) have rapid permeability. The shallowness to sand or gravel severely limits the water-holding capacity and natural fertility is low. The well drained soils (70A, 70B, 695A) have fair to good water-holding capacity and are suitable for landscaping and agricultural crops, though supplemental irrigation may be needed to overcome droughtiness. Most of the site presently in agriculture falls within this category. The moderately well drained soil (45A) has a moderately-high water table during wet seasons. During the period of high saturation, usually in early spring, the water table remains within 15 to 20 inches of the soil surface.

The remaining soils are found primarily on the sides and top of the drumlin-like hill, with smaller areas located in the southern portion of the site. The soils of natural soil group B are formed in the thicker unconsolidated deposits of till usually occurring on hillsides or hilltops. Stones and large boulders are common in these deposits and add difficulty when excavating or earth moving operations are needed. Soil 11MD has slopes over 15%, which impose severe limitations for development. Soil 41MC exhibits a seasonal high water table.

The soils of natural soil group D are characterized by steep slopes, rock outcrops, and a shallow depth to bedrock. As can be seen on this site, they are located on the steep side slopes of hills. These areas provide contrast in the landscape and scenic overlooks, but are not themselves suited to intensive development.

Vegetation and Wildlife. With the exception of the active agricultural area, the site is covered with mixed hardwood and pine trees. Most trees are sapling to pole sized (4-10 inches in diameter). The area has low to medium

value for hardwood growth and medium to high value for white pine. Stocking of the area is full, but the quality of the main stand is low.

With the combination of the open agricultural land, the rivers, and the woodland, the site provides a good wildlife habitat. The most valuable resources are the rivers. Both the Quinebaug and Five Mile Rivers are stocked with trout. There is also a long range program for restoring certain Anadromous Fish, such as Alewives, Shad, Sea Run Trout, and possibly Salmon, to the rivers. Water quality and temperature will be a critical factor in the success of this program.

Land Use. Present uses of the proposed industrial area are agriculture, residential, industrial, and undeveloped. The area now owned by the Killingly Industrial Foundation is in corn silage. Including adjacent fields, this represents about 1% of the County's corn silage acreage. The fields are classified as Agricultural Capability Class II, sub-class 2E, land, which is included as good agricultural land in the Report of the Governor's Task Force for the Preservation of Agricultural Land.

Planning. The proposed location of the Killingly Industrial Park has the full support of the Killingly Planning and Zoning Commission. The Commission formally endorsed the park location in the Killingly Plan of Development, which was adopted on December 10, 1974. In the proposed zoning regulations for the town, the park site is also designated as an industrial zone. The proposed regulations contain a provision prohibiting any use which:

"-is injurious, noxious, or detrimental to the surrounding neighborhood by reason of the possible emission of excessive dust, odor, fumes, chemicals, gas, refuse matter, noise, vibration, glare or light."

"-poses the threat of contamination to any water course, aquifer, or other water source or body."

"-presents a possible hazard or dangerous nuisance to any residents of the town."

The proposed industrial park is in keeping with the Regional Plan of Development for Northeastern Connecticut. The Overall Economic Development Plan for the region also supports the creation of such a park and completion of any necessary improvements in transportation and utilities.

Finally, the proposed site is shown as "suitable for urban development" in the State of Connecticut's Plan of Conservation and Development. Although the site contains an aquifer, it is not identified as being in need of protection in the state plan.

WATER SUPPLY

Crystal Water Company, a private company, operates Killingly's public water supply. The company already owns a 3 acre portion of the site and has drilled a 130 foot well. Inspection of available boring logs for the immediate site do not give favorable indications of locating a large supply (1 to 2 million gallons per day) of subsurface water. The Crystal Water Company recorded 450 gpm, which is the equivalent of .648 mgd. This is due to the fine grained nature of the materials

which do not lend themselves readily to development by large capacity screened wells. If large quantities are required, it would be feasible to serve the industrial complex from a number of wells.

Protection of the water supply from contamination is important. Due to the gravel soils in the initial area to be developed and the proximity to the well location, only dry industrial types of wastes should be allowed to occupy the site.* Any gasoline, oil, or other chemical storage tanks must be kept above ground. Any proposed industry should be approved by the Public Water Supply Section of the State Department of Health and by the Crystal Water Company to assure adequate protection of the water supply.

Examination of the water supply in October, 1965, indicated that the water may become corrosive to piping. The industries must be concerned with the possible effects of the water.

Installation of water supply lines should not offer any major problems with the exception of the drumlin-like hill where stoniness and shallow depth to bedrock could present difficulties in construction.

WASTE DISPOSAL

Municipal sewers are presently under construction and will extend to the center of the site. Both the sewers and the sewage treatment plant have excess capacity. However, before an industry is accepted into the proposed industrial park, the nature and volume of the waste material expected from their operation should be checked to insure that adequate treatment and capacity is available.

Although on-site waste disposal generally was not considered, the highly permeable soils of natural soil group A may have a beneficial use to some industries. For example, some industries require large quantities of water for cooling purposes. With the exception of heat, this water may be relatively unpolluted. If after use this water could be cooled to acceptable standards, an irrigation system or ground water recharge well may be an excellent method of disposal. In addition, this would relieve the sanitary sewer system of an appreciable volume.

Other types of industrial wastes generated must also be considered. No toxic nor hazardous substances nor solvents could be accepted at the municipal refuse disposal site. A list of solvent collectors may be obtained from the Water Compliance Section of the Department of Environmental Protection (DEP). A permit for disposal of industrial waste must be obtained from the Industrial Waste Management Section (Jeffrey Heidtman) of DEP.

At the present time, corrective actions are being taken at the Killingly landfill to meet state standards. This includes plans to control drainage, leachate, erosion, and litter. A recycling program is also being established for glass, metal, paper, and rubber so as to reduce the demand on the landfill. With the modifications being made, the landfill should have a long life expectancy. It is felt that most waste materials generated during construction of industries could be recycled into the established markets or local housing programs. Once an

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* Dry industrial types of wastes are those not using any solvents or other chemicals which could cause contamination of the water supply.

industry is operating, the Killingly landfill should be able to handle all normal wastes. Specialized wastes, as described previously, would have to be disposed of according to DEP regulations.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

In the area of the terrace soils, little or no difficulty is anticipated with foundation support. Steep slopes, varying depth to bedrock, and/or seasonal high water tables could present problems on the drumlin-like hill.

With more than 75 percent of the soils being excessively or well drained, storm water runoff under present conditions is minimal. The overall effects of roofing, paving, and landscaping may create some drainage problems, but with proper planning these should be minor. The major hazards of runoff are its increased temperatures and the silt and sediment it carries. Erosion during and after construction could cause aggravation of the stream beds. Sand and salt from roads could also affect the streams. Runoff from parking lots on hot summer days might increase the river temperatures. By preventing direct discharge into the rivers through subsurface disposal or retention basins, the potential adverse impacts can be avoided. Measures for preventing these problems should be incorporated into the development plans.

Slope stability, erosion, and sedimentation are areas in which some difficulties could develop. The nature of the terrace soils does not lend itself readily to the establishment of vegetation once the area has been stripped. Irrigation may be required to support plant growth or specially adapted plant materials should be considered.

The Town should require an erosion and sediment control plan to be prepared by any industrial developer, showing the construction time table and proposed handling of disturbed areas. Debris basins, diversions, temporary seedings, and land grading are examples of preventative measures which can be used.

Since the rivers are of prime consideration, a buffer area/greenbelt extending from the rivers to the top of the adjoining escarpments is recommended. Any development should be prevented in this area with the exception of passive recreational facilities.

ROADS AND UTILITIES

Connecticut Route 52, a four-lane, divided, limited access highway, runs through the site. There is a full interchange on Attawaugan Crossing Road/Lake Road. This highway is presently under-utilized and can easily accommodate additional traffic. The Norwich to Worcester railroad also runs through the site.

Lake Road will probably need to be widened to accommodate additional traffic generated by the industrial park. The addition of a railroad siding would also be beneficial. These improvements are being included in a grant application to the Economic Development Administration. Construction of new roads should experience little or no difficulty if confined to the terrace areas.

HAZARDS

Water and air pollution are the two most obvious potential hazards with an industrial development. Through proper sewage and waste disposal, storm drainage systems, and erosion control the potentials hazards of water pollution can be avoided or minimized. In regard to air quality, both direct and indirect sources should be considered. The direct sources of industries could lower the air quality. However, this type of source can be predicted fairly accurately with a given industry and measures for lowering emissions can be incorporated into the plans. With the proximity to residential and agricultural uses, any industry which would significantly lower air quality should not be permitted. White pine is a fragile species subject to damage by air pollution (SO_2+NO_2). Indirect sources, arising primarily from increased traffic, are more difficult to predict. Not only is traffic at the industrial site of consideration, but also increased traffic on Route 52. These factors should be included when determining the impact on air quality by future industries.

Consideration should be given to noise, hazards to children, and increased vehicular traffic on roads and railroads. Preventative and safety measures should be taken where possible.

AESTHETICS AND PRESERVATION

As mentioned previously, a buffer strip extending to the top of the escarpments alongside the Quinebaug and Five Mile Rivers is recommended. This would help maintain present water temperatures and avoid disturbance of the river banks or beds. The Killingly Plan of Development appears to support this streambelt concept. However, the area shown as "residential limited" between the industrial area and the Quinebaug should also be included as open space in any plan for the industrial park.

Preservation of the streambelts will also help to maintain some of the present wildlife value of the area. Planting wildlife shrubs along the perimeter of the industrial park adjacent to the streambelts will encourage smaller wildlife species and song birds. With any development of this nature, however, a reduction in larger wildlife species can be expected.

Another benefit arising from streambelt protection is that of recreation. With both streams being stocked with trout, the areas would have considerable value for fishing. The floodplain areas could also be used for picnicking, hiking, and other forms of passive recreation. With its heavily wooded banks, the Five Mile River would be a particularly aesthetic location for such activities. A dam along the Five Mile River may also be of some historic interest.

With the availability of easily developable land in the proposed area, leaving the drumlin-like hill might also be considered. Physically, it presents limitations for development due to steep slopes, shallow depth to bedrock, and seasonal high water tables. Since it runs parallel to Route 52, it would effectively screen the area from view. It would also help screen the homes near the intersection of Maple Street and Lake Road. If the hill is used, it should be restricted to low density, low profile structures which would leave most of the hill undisturbed.

COMPATIBILITY OF SURROUNDING LAND USES

The most concentrated development in the vicinity of the industrial park is the recreational housing around Alexander's Lake. It was suggested that a buffer strip of vegetation be left or planted between the residential area and the industrial park. Though it would not serve to significantly reduce noise levels, it would provide a visual barrier that would help to maintain the present character around the lake. To be effective, such a buffer strip should be 100 feet wide and may include evergreens, flowering shrubs, and small, colorful trees, such as white pine, hemlock, dogwood, crab apple, locust, mountain ash, and mountain laurel.

Similar buffers around the residential homes on Lake Road and Maple Street would also be desirable.

The remaining land uses in the area are agricultural or industrial. The three existing industrial sites are located such that they could be incorporated into the industrial park. As stated earlier, there will be a loss of around 100 acres of good agricultural land.

A small portion of the industrial park abuts the Putnam industrial park. Taken together, these adjacent facilities are capable of attracting major new industries to northeastern Connecticut. Both have excellent highway access and are served by an operating rail freight line.

ALTERNATIVE LAND USES FOR AREA

The majority of the site is well suited to development of any type. Its proximity to Route 52 and the rail line and the accessibility of municipal sewerage makes it a desirable location for industry. The Town feels it needs new sites for industry as few now exist and several local industries have moved to adjacent towns. The high unemployment rates in the region also underscore the need for additional employment opportunities.

The major trade-off being made by locating an industrial park on this site is the loss of prime agricultural land. Another resource on the site is the sand and gravel which will become inaccessible once developed.

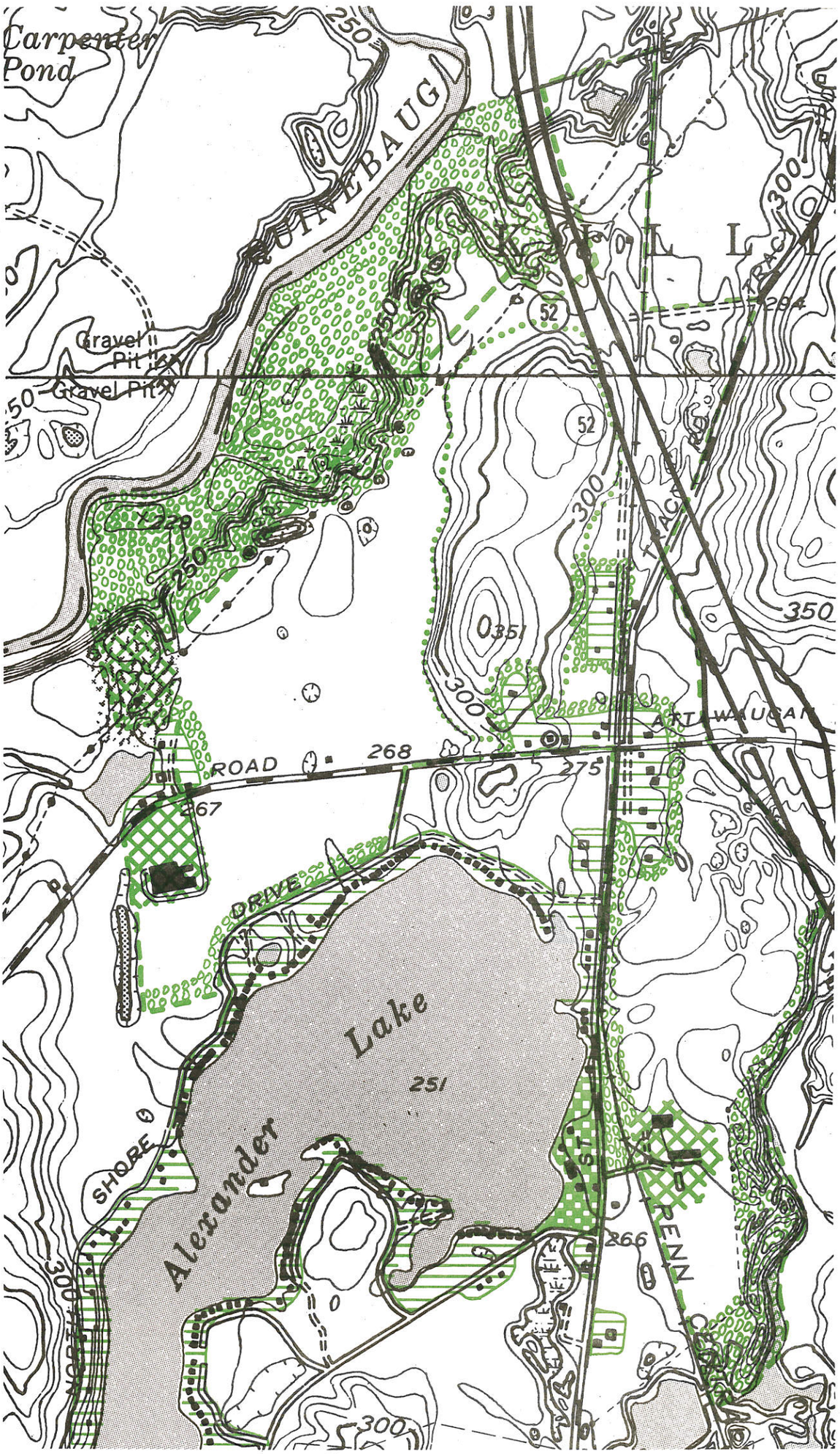
SUMMARY

It is assumed the Town has weighed the alternative uses for this site and alternative locations for industry before designating this site as an industrial area on the Town Plan. Its physical and geographic characteristics make it an excellent site for industrial use. The main factors to be considered in development should include streambelt preservation along the Quinebaug and Five Mile Rivers, buffers around existing residential uses, and protection of air and water quality. Many recommendations are made within this report which will contribute to the achievement of these goals. On the map on page 16 a sketch of the proposed industrial area, existing land uses in the vicinity, and suggested buffer zones are shown. It would appear that following the development of the area along Lake

Road, the portion east of Maple Street would be the next most suitable area to develop. The area east of Route 52 along Track Road seems most useful as a link with the Putnam industrial park, but with limited development potential of its own due to its small size and the location of the rail line. The drumlin-like hill should be left as is, if possible, or developed at a very low density. In conclusion, this area should be able to provide the potential industrial sites the Town needs while still maintaining the quality, character, and recreational potential of the nearby rivers and lake.

EXISTING LAND USES

WITH SUGGESTED BUFFER ZONES



EXISTING USES

- RESIDENTIAL
- RECREATIONAL
- INDUSTRIAL
- AGRICULTURE, FORESTS, AND OPEN LAND

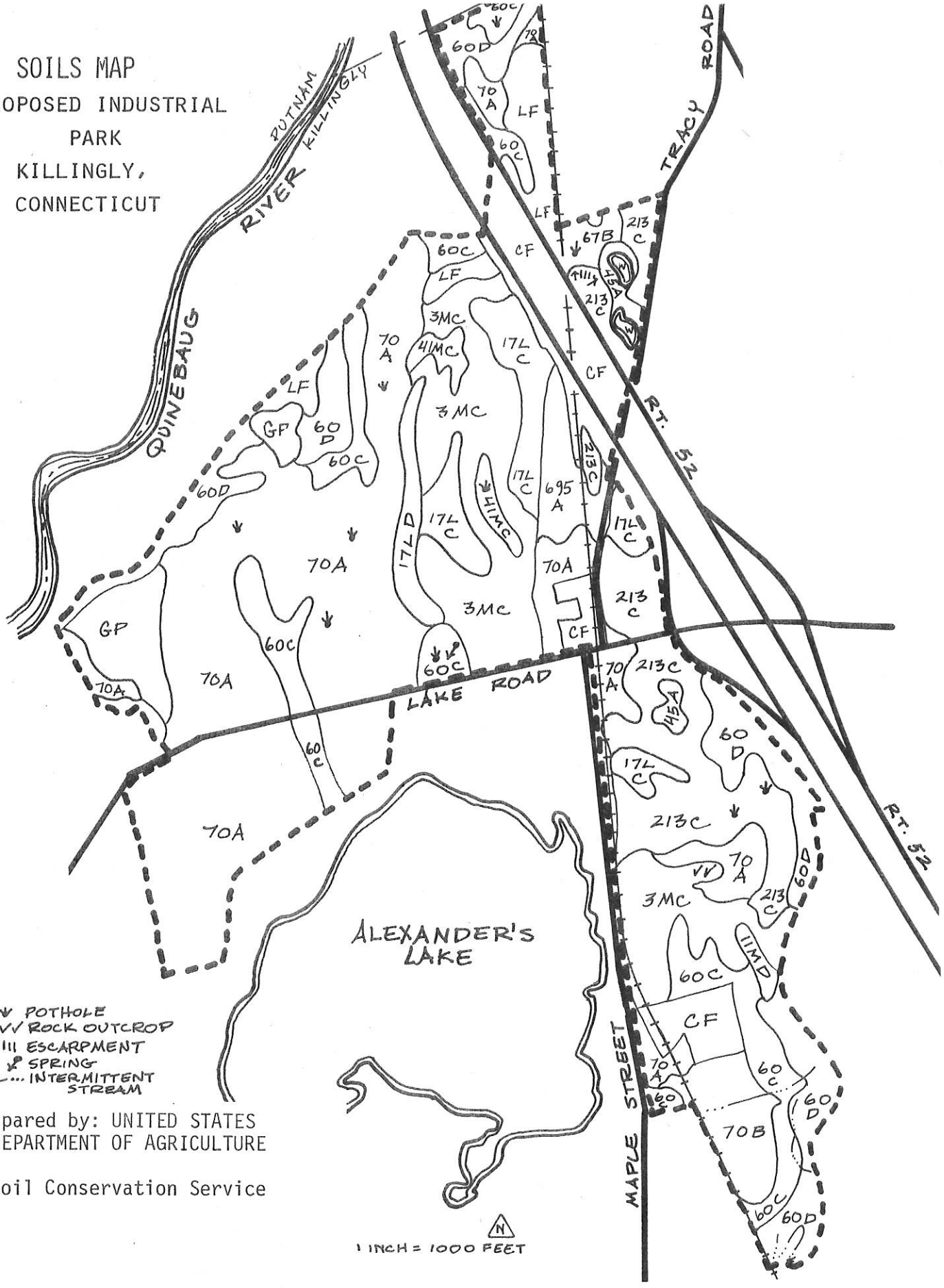
- APPROXIMATE BOUNDARY
- SUGGESTED BUFFER ZONES
- DRUMLIN-LIKE HILL TO BE LEFT UNDEVELOPED OR DEVELOPED AT A VERY LOW DENSITY

1 INCH=1000 FEET N

APPENDIX

SOILS MAP

PROPOSED INDUSTRIAL PARK
KILLINGLY, CONNECTICUT



Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service

ADVANCE COPY, SUBJECT TO CHANGE

JANUARY, 1975

SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Acres	Percent of Total Acres	Limitations For:** On-site Sewage	Base ments	Land-scaping	Streets and Parking	Principal Limiting Factor(s)
A-1a	67B	2.4	0.8	1	1	3	2	Slope 3-8%, excessively drained.
A-1b	60C,60D 213C	85.4	26.9	2	2	3	3	Slopes 8-15% and over 15%, excessively drained.
A-1d	70A,70B 695A	159.7	50.3	1	1	2	1	Droughtiness.
A-2	45A	2.9	0.9	2	2	2	2	Seasonal high water table.
B-1c	3MC	38.4	12.2	2	2	3	3	Stoniness, slope 8-15%.
B-1e	11MD	0.9	0.3	2	2	3	3	Stoniness, slope over 15%.
B-2b	41MC	3.8	1.2	2	3	3	3	Stoniness, slope 8-15%, seasonal high water table.
D-1	17LC	18.5	5.8	3	3	2	3	Shallow to bedrock, slopes 8-15%.
D-2	17LD	5.3	1.6	3	3	3	3	Shallow to bedrock, slopes over 15%.
		317.3	100.0					
un-classified	LF	land fill						
	CF	cut and fill						

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

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

ACREAGE SUMMARY OF SOILS LIMITATIONS

	Slight		Moderate		Severe	
	Acres	%	Acres	%	Acres	%
On-site sewage	162.1	51.1	131.4	41.5	23.8	7.4
Basements	162.1	51.1	127.6	40.3	27.6	8.6
Landscaping	-	-	181.1	57.0	136.2	43.0
Streets and Parking	159.7	50.3	5.3	1.7	152.3	48.0