environmental review team report

INDUSTRIAL SITE

PRESTON, 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 THE
INDUSTRIAL SITE
PRESTON, CONNECTICUT
MARCH, 1974

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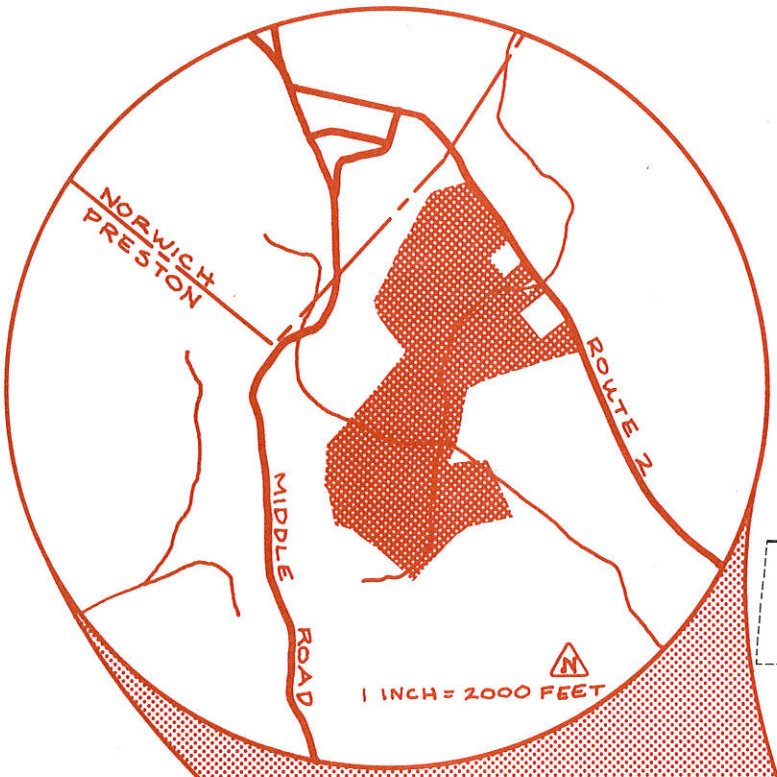
EASTERN CONNECTICUT RESOURCE CONSERVATION
AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE



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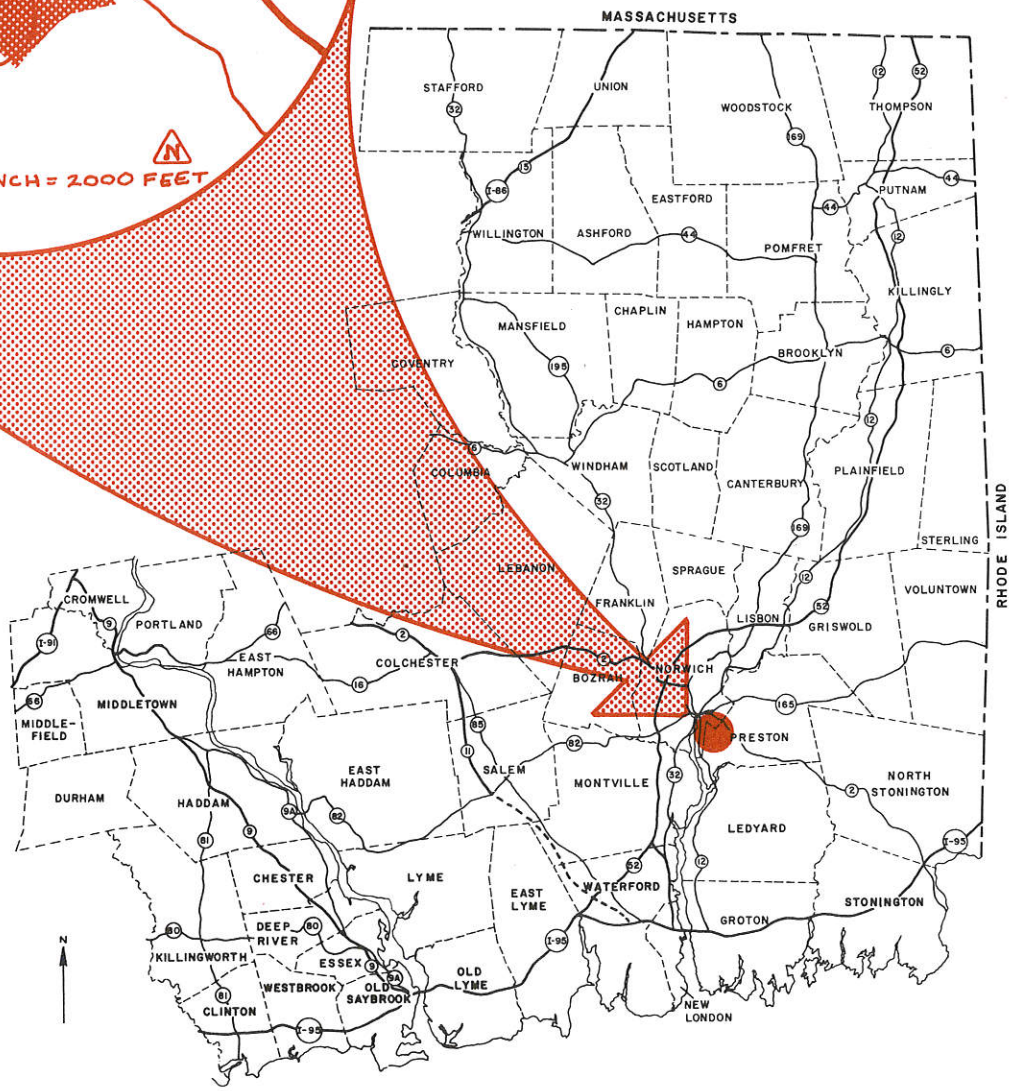


EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
INDUSTRIAL SITE
PRESTON, CONNECTICUT

This report is an outgrowth of a request from the Preston Planning and Zoning Commission, with the approval of the owner, Leon Sakow, to the New London County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Project Committee 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 industrial site consisted of the following personnel: Phillip Renn, Civil Engineer, Soil Conservation Service (SCS); Timothy Dodge, Biologist, SCS; Peter Dodds, Student Biologist, Eastern Connecticut State College; Richard Hyde, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); Clarence G. Merrill, Forester, DEP; Donald Capellaro, Principal Sanitarian, State of Connecticut Department of Health; David R. Miller, Climatologist, Connecticut Cooperative Extension Service (EXT); Rudy Favretti, Landscape Architect, EXT; Linda Simkanin, Regional Planner, Southeastern Connecticut Regional Planning Agency; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on February 7, 1974. 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 both the Town of Preston and the developer. 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 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 Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

INTRODUCTION

The site in question consists of approximately 100 acres on the southwest side of Route 2 in Preston, about 500 feet from the Norwich boundary. During 1973, the site was rezoned to industrial use. The purpose for this change was to proceed with the development of an industrial park.

Inquiries by the owner to the City of Norwich indicate that municipal water could be extended to the site, but that commitments regarding the availability of municipal sewers cannot be made at this time. The owner indicated that warehousing and/or light industry are the types of development anticipated. The water and sewage systems, particularly if developed on-site, could limit the potential intensity of use on the site.

The property is characterized by both rocky upland areas and swampy lowlands with several streams traversing the site. Considerable disturbance of the site has occurred, both in conjunction with the previous use of the site as a dump and present grading operations. This has involved placement of upland materials in the lowlands. Before this filling proceeds further the effects of this should be determined, particularly in regard to flooding and water quality. A plan of development should be prepared first to avoid undesirable and/or unnecessary site preparation.

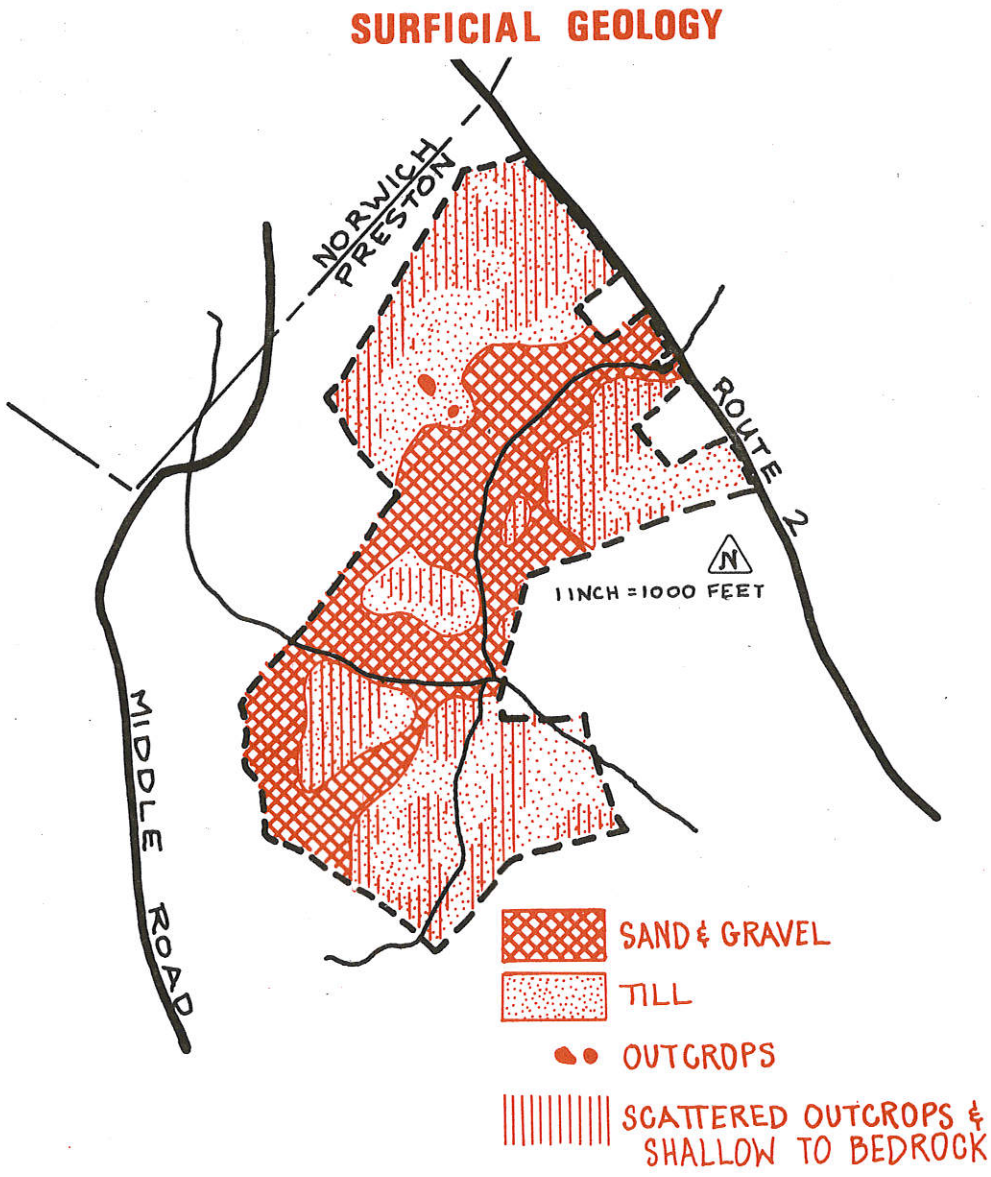
The following report will explore in further detail the various aspects of the proposed development, preceded by a description of the physical resources of the site. Recommendations or comments made within this report are presented for consideration by the developer and town in the preparation and review of development plans and should not be viewed as mandatory or regulatory in nature.

EVALUATION

GEOLOGY, SOILS, AND TOPOGRAPHY

Geology. The type of bedrock underlying this site falls within a broad group of rocks called the Putnam gneiss (U.S. Geological Survey, Norwich Quadrangle, GQ-144). Specifically these rocks are of the sillimanite-pinite schist phase which is a medium-grained material containing the minerals of quartz, biotite, oligoclase, andesine, sillimanite, garnet, plus several other minor mineral components.

The unconsolidated earth material lying on top of the bedrock surface (surficial materials) at this particular site can be differentiated into two distinct types, till and stratified drift. The surficial geology map below shows the distribution of the till and stratified drift on the site.



Till is a geologic term, commonly called "hardpan" or "boulder clay" by the lay person. These terms all refer to the predominant types of overburden in Connecticut which were deposited directly when glacial ice melted after the last ice advance some 13,000 years ago. Till by definition is a heterogeneous material composed of various mixtures of boulders, gravel, sand, silt, and clay particles, none of which are significantly sorted or stratified by grain size, as is the case with waterlain deposits. The abundance of bedrock outcrops in this area indicates the till is only a thin mantle probably not exceeding five feet in thickness at any one place. Because of this situation, the topography of the land surface is probably quite indicative of the topography of the underlying bedrock although the bedrock would be more irregular and rugged (see the topography map on page 8).

The stratified drift consists of thin deposits of stratified and sorted gravel, sand, and silt located primarily along the surface drainage system. Because significant thicknesses of this material are not present, the use of these deposits for a water supply can be ruled out. Topographically the land area formed by these deposits is relatively flat. The small thicknesses in combination with the level terrain creates a condition where a seasonably high water table exists. Results from the detailed soils mapping program for Preston confirms the existence of this type of problem.

Soils. A detailed soils map of this property 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. Also to be noted is that this area was mapped in 1972. Since that time, the area of made land (ML-1) has increased to both the north and west. This has involved the removal of material from the upland areas (204D) and the filling of the lower areas (291).

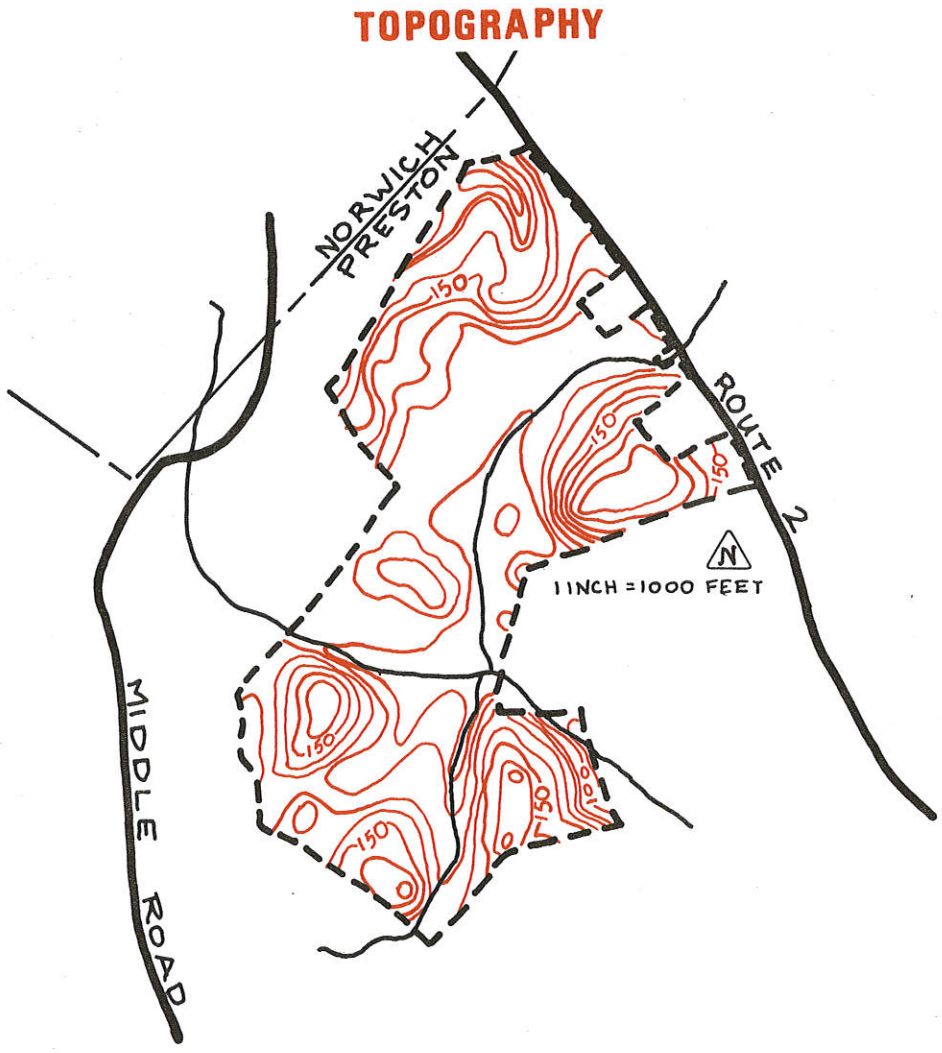
The soils limitations chart indicates the probable limitations for each of the soils for on-site sewage, basements, landscaping, and streets and parking. However, limitations, even though very severe, do not always preclude the use of the land for development. If economics permit greater expenditures 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.

All soils with a Natural Soils Group designation ending in 3b are very poorly drained soils having water ponding on the surface for significant periods in the winter and early spring. This would include the 27.5 acres on this site mapped as 43L, 27M, and 291. These soils fall within the jurisdiction of Public

Act 155, the Inland Wetlands and Water Courses Act, and are generally unsuitable for development due to their high water table.

The remainder of this site, with the exception of the made land, falls within Natural Soil Group D. The soils 200BC, 173MBC, 173MD, and 204D comprise 62.4 percent of the site or 59.8 acres. These soils characteristically occupy rocky upland ridges and steep side slopes. Rock outcrops occur frequently (see surficial geology map on page 6) and soils shallow to bedrock are interspersed with pockets of deeper soils. The rock outcrops and soils shallow to bedrock cause severe problems and high construction costs when developing this land for urban uses. The pockets of deeper soils present fewer problems for construction. Careful site selection and planning is imperative in developing these soils for urban uses.

Topography. The topography map below reflects the same



general pattern as the surficial geology map. The topographic highs correspond with the till areas, and the lowlands correspond with the areas of stratified drift. The surface drainage system is composed of several small brooks which all eventually combine and exit the property in the southeastern portion. The groundwater system follows the same general pattern as the surface water system.

WATER SUPPLY

Municipal. Although a public water supply is not presently available at the site, indications are that the municipal system in Norwich, which is within 2,000 feet, could be extended in order to service the property. This appears to be the most feasible and reliable approach. Installation of water transmission lines in the upland areas will encounter bedrock which will result in increased costs.

On-site. On-site water sources derived from the surficial materials are highly unlikely due to the shallowness of the sand and gravel deposits. Therefore, bedrock wells would be the most likely source for an on-site water supply.

Throughout this area of eastern Connecticut the bedrock is hard, dense crystalline rock composed of tightly interlocked mineral grains which make passage of water through the intergranular openings extremely slow and difficult. However, most bedrock groundwater flows along the cracks or joints within the rock and these, based on extensive geologic investigation, are found to be larger and more numerous within the two hundred feet of rock closest to the land's surface. Wells placed in this zone usually yield small but dependable quantities of water which, on the average, is enough for most single dwelling needs.

From the compilation of well drilling records for the surrounding area, 9 out of 10 bedrock wells yield at least 3 gallons per minute while "dry holes" and wells yielding up to 100 gallons per minute are extremely scarce. To gain a more accurate feeling for the bedrock capacity to yield water it might be worthwhile for the developer to conduct a small survey of the surrounding businesses and homes to find out just how much water existing bedrock wells are producing. Information of this type may help significantly and affect future decisions on the types of industry and business that can eventually be allowed to build in this particular location if on-site supplies are to be used.

WASTE DISPOSAL

The method for disposal of domestic and industrial waste is an important consideration for any type of development, particularly an industrial development. With the resource conditions as

they are at this site, namely the high water table, numerous bedrock exposures, and shallow depths of overburden, the locations for septic systems will be greatly limited. Because of these natural conditions the possibility for septic system failure will be great and the potential for the contamination of the surrounding surface water bodies and the groundwater system will be high.

The ideal solution and the one that should be vigorously strived for is the linking of this project to a municipal system in order for liquid wastes to be properly treated. Naturally a small park with a few employees and containing industries which do not produce a manufacturing or process waste could possibly get along with on-site systems. However, to allow this sort of arrangement to be initiated could result in serious problems in the future if industrial development trends and conditions change, resulting in a movement of industry toward more product- or chemical-oriented businesses.

As with the water supply, the most desirable approach would be a tie-in with the municipal sewerage system of Norwich. The main obstacle at present is the inability of Norwich to assure the use of its sewerage facilities. However, due to the adverse conditions on the site, it is strongly recommended that municipal sewers be provided.

Another possibility for sewage disposal would be the use of on-site package treatment systems. This type of system would require regular supervision and maintenance.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

The wetland soils present very severe limitations for foundation development due to their high water table. Substantial filling and drainage are necessary for development in these areas. Careful site investigation is necessary in the upland areas to avoid differential settlement.

Erosion and sedimentation during and after construction are potential problems with any type of development. The potential effects are even greater when watercourses are nearby. At the present site the numerous streams and the grading operations underway present an undesirable situation.

Erosion control devices, such as grassed strips, baled hay dams, and sediment basins, should be used. Plans for controlling erosion should be incorporated into the construction plans and implemented prior to the start of construction. Permanent erosion and sedimentation control devices should also be installed where necessary, particularly in conjunction with storm drainage.

Use of the Erosion and Sediment Control Handbook for Connecticut is recommended as an aid in the location, design, and installation of the appropriate erosion control practices. These measures should be incorporated into the development plan. A copy of the handbook, as well as technical assistance in preparing or reviewing an erosion control plan, can be obtained from the county Soil Conservation Service Office.

ROADS AND UTILITIES

Development of roads on the site will require careful design and construction. Some of the factors to keep in mind are the high water table in the lowlands, steep slopes in the uplands, and the possibility of a large amount of heavy truck traffic. Control of storm drainage should also be incorporated into the development plans.

Installation of utilities should not encounter any severe difficulties, though the cost of construction will be more in the areas that are rocky and shallow to bedrock.

HAZARDS

The main potential hazard with respect to the proposed development is flooding, both on and off the site. The watershed area above the site encompasses about 450 acres. As mentioned earlier, the streams all combine into one which runs southeasterly from the site. The steep slopes on either side of this stream could restrict the flow during a severe storm, causing backwater to occur.

Development of the site will aggravate the flooding potential. Paving over large portions of the site will substantially increase peak run-off (and decrease low flow). This can be minimized by discharging storm run-off into the ground (i.e., dry wells) rather than directly into the watercourses. The use of porous pavement might also be considered.

Continued filling of the wetlands will also increase flood potential due to a loss of storage capacity in the wetlands and increased run-off. Further development of the site should consider protection of the remaining wetlands rather than destruction.

Necessary pipe sizes and elevation of filled areas will require additional study. Culverts at Route 2 and downstream of the site should be checked for capacity with regard to any increase in peak run-off resulting from the development of this site.

When specific proposals are made for the site, the air pollution standards should be checked.

AESTHETICS AND PRESERVATION

Forestry. The property is primarily wooded, except for the filled areas. There is no really valuable timber on the property, though there are some stands of hemlock on the south and southeast boundaries. Any industrial development will necessarily result in a loss of some trees. Any filling and/or change of the water table in the wetland would undoubtedly kill off large areas of the swamp.

Some of the adverse effects can be avoided or at least minimized by restricting development to the upland and previously filled areas. In the forested areas development should be planned so that ground disturbance can be kept to a minimum. Instead of leveling whole hills, the size of the building and parking lot should be fitted to the area.

Leaving and/or planting trees in east-west strips across the valley will reduce the up and down valley air movement while increasing air turbulence, resulting in reduced heating needs and better dispersion of air pollutants. Landscaping within the filled areas will also improve the aesthetics.

Strips of 50 feet or more of conifers between developments are recommended. Preferred species are pines. White pine is native and will grow readily, although it is more susceptible to air pollutants than Austrian pine. Conifers should be used since they provide a better wind barrier and noise absorber.

Another point that should be stressed is the utilization of wood products that will be removed for development. With forethought and planning, it should be possible to commercially remove most of the wood from the development sites.

Wildlife. Within the project area, there is a desirable combination of wetlands, streamflow, woodland, and some overgrown land. Red maple, hemlock, birches, mountain laurel and other shrubs are found in the lower areas, with oaks and other hardwoods in the upland areas. The area offers habitat to song birds, deer, rabbits, squirrel, ruffed grouse, and other woodland and openland wildlife. In some areas a mature overstory may lower the habitat quality, though there is a good potential for improvement. In already disturbed areas, plantings with wildlife values are a must. The degree of development will somewhat dictate what types of wildlife will use the area. However, all future plans should call for wildlife plantings. Assistance in determining appropriate plantings can be obtained from Region IV of the Department of Environmental Protection or the county Soil Conservation Service Office.

Fish. A small stream system composed of 1 or 2 intermittent streams, 3 perennial streams, and associated wetlands (approximately 27 acres) exists within the project area. Collectively

they constitute a valuable resource and should be protected. The perennial streams probably support small native brook trout as well as other aquatic life, and may be important as possible spawning streams. They should be protected from sediment resulting from construction work, present and future, as well as possible run-off pollutants resulting from industrial development.

Approximately 200-250 feet of an existing perennial stream have been enclosed in concrete pipe with immediate plans calling for an additional 200 feet to flow through concrete pipe. Enclosing the stream in concrete destroys stream productivity and changes flow conditions in these areas. It may also change up and downstream characteristics.

Aesthetics. Many of the recommendations above will also contribute to the aesthetics of the site. Natural features such as rock outcrops lend themselves to landscaping. A variety of vegetation includes species such as hemlock and mountain laurel. Development plans should make the best use of these natural resources. In the upland area, clusters of smaller buildings would be easier to fit into the landscape than ones requiring a large area.

COMPATIBILITY OF SURROUNDING LAND USES

The existing land uses in the immediate area of the Sakow property consist of residential, commercial, and undeveloped. The Norwich-Preston town line is within 500 feet of the site, and Connecticut Route 2 borders on the northeast side of the site. Immediately adjacent to the site along Route 2 are primarily commercial uses. Most of the neighboring residential use is located within Norwich, and is shielded from the site by a ridge running along the town boundary.

Based on the current pattern of land use, industrial development might be a compatible use. However, careful attention must be paid to the actual location of the development, as extensive wetlands and shallow to bedrock soil types dominate the site. Connection with Norwich sewer and water systems would enhance any industrial development, and offer protection to the environment. The site is zoned industrial.

In its review and approval of the Preston zone change from commercial to industrial in May of 1973, the Reference Committee of the Southeastern Connecticut Regional Planning Agency recommended that for any industrial development of the site, "a parallel line be established at a distance of 250 feet from the Norwich City line. This area would serve as a forested buffer zone and should retain its current residential zoning classification."

ALTERNATIVE LAND USES FOR THE AREA

The best land use alternatives for this site appear to be low density residential and undeveloped. The terrain and soil types of the site do not provide for sand and gravel excavation or agriculture. Most residential, commercial, and industrial development would encounter serious problems due to the natural characteristics. The limitations imposed by these characteristics would tend to increase with the intensity of the development.

Any industrial development on the Sakow property should be restricted to the soils of Natural Soil Group D and the made land. Protection of the remaining wetlands on the site is important for its value both in flood protection and as a wildlife habitat, as well as its aesthetic appeal. The southern portion of the site is interlaced with the wetlands and would best be left as a natural area or used for very limited development on the upland areas.

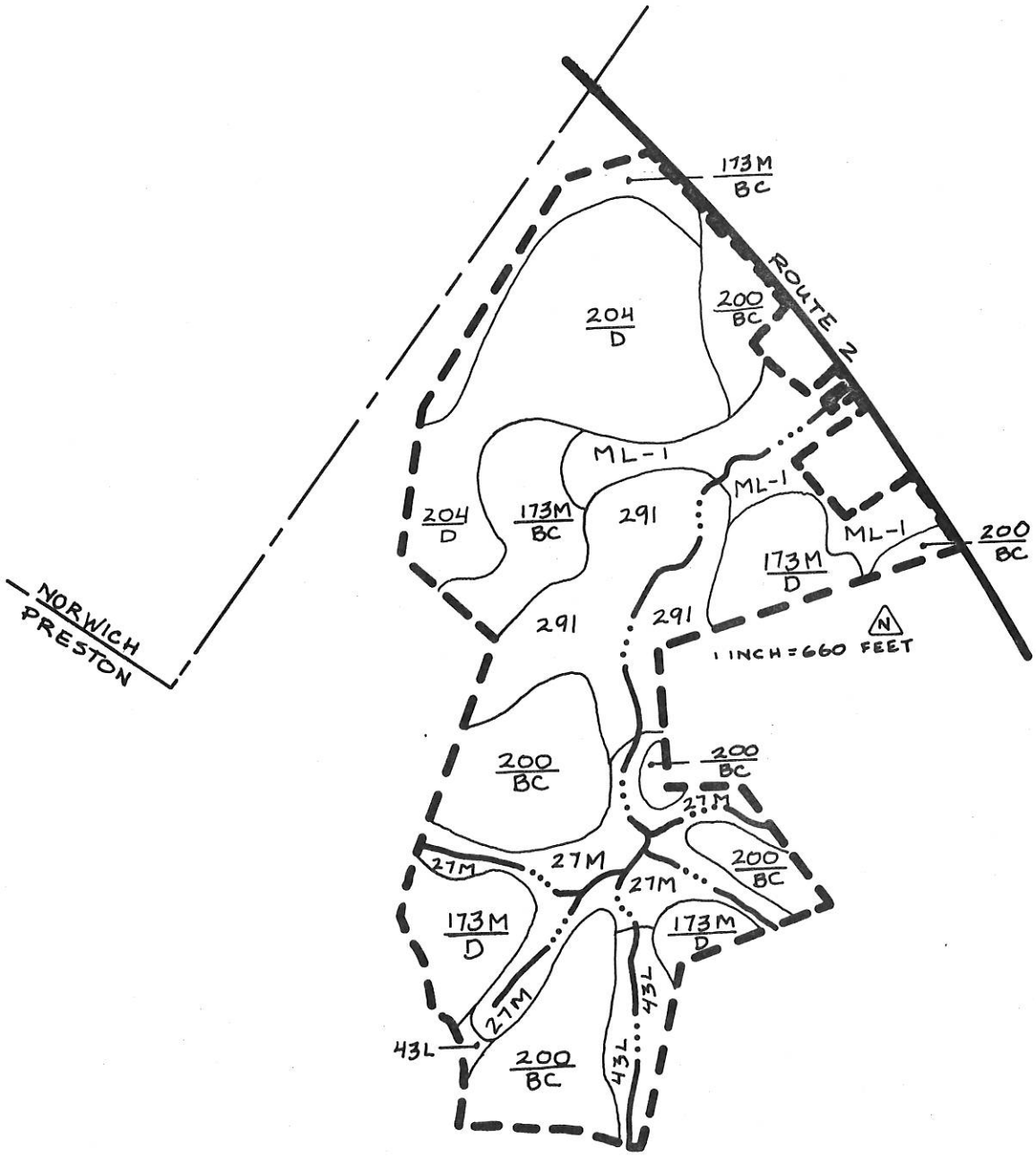
For this site to be developed with minimal adverse effects, a detailed plan should be drawn up. The plan should show changes in topography, planned elevations, planned locations for roads, parking areas, buildings, and utilities, and drainage and erosion control measures. Construction should not proceed until these plans are complete.

APPENDIX

SOIL MAP

INDUSTRIAL SITE

PRESTON, CONNECTICUT



Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

ADVANCE COPY, SUBJECT TO CHANGE *SEPTEMBER, 1972*

SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Acres	Percent of Total Acres	Limitations for: ** On-Site Sewage	Basements	Landscaping	Streets and Parking	Principal Limiting Factor(s)
B-3b	43L	4.0	4.2	4	4	4	4	High water table, stoniness
C-3b	27M	11.0	11.5	4	4	4	4	High water table, stoniness
D-1	200BC	21.2	22.1	3	3	4	4	Shallowness, slope 3-15%
D-2	173MBC 173MD 204D	38.6	40.3	4	4	4	4	Shallowness, slope 3-35%
G-3b	291	12.5	13.0	4	4	4	4	High water table
Not Classified	ML-1	8.5	8.9	This is made land. Suitability can only be determined by on-site investigation.				
		95.8	100.0					

* 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; 4-very severe.

ACREAGE SUMMARY OF SOILS LIMITATIONS

	Severe		Very Severe	
	Acres	%	Acres	%
On-Site Sewage	21.2	22.1	66.1	69.0
Basements	21.2	22.1	66.1	69.0
Landscaping			87.3	91.1
Streets and Parking			87.3	91.1