environmental review team report

PROPOSED INDUSTRIAL PARK

Plainfield, 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
PROPOSED INDUSTRIAL PARK
PLAINFIELD, CONNECTICUT

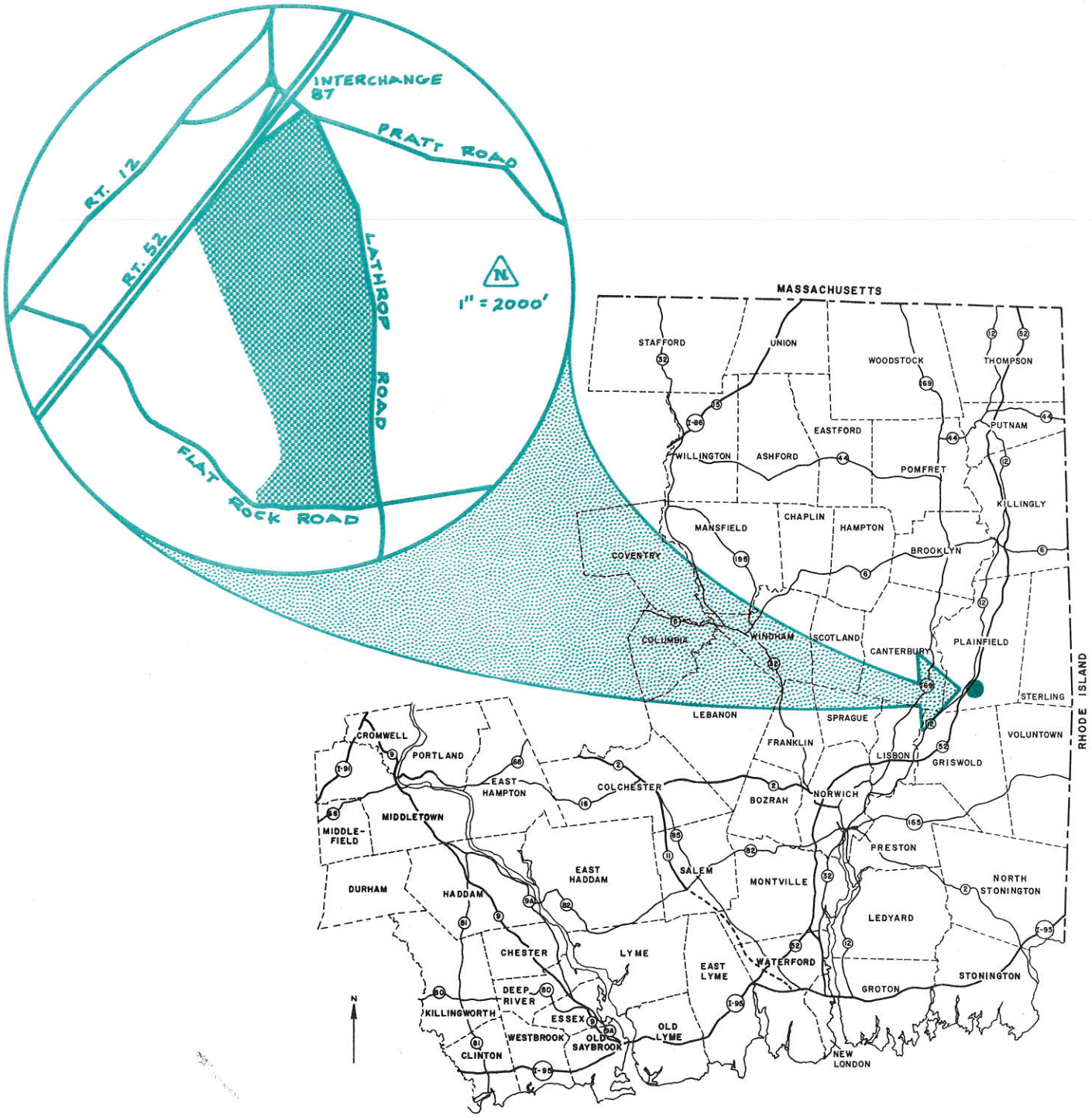
SEPTEMBER 1973

Preparation of this report has been, in part, assisted by a grant from the New England Regional Commission administered by the Southeastern Connecticut Regional Planning Agency

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

LOCATION OF STUDY SITE

PROPOSED INDUSTRIAL PARK
PLAINFIELD, CONNECTICUT



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This report is an outgrowth of a request from the Town of Plainfield Economic Development Commission, with the approval of the owner, 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 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, natural soil group descriptions, 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 park consisted of the following personnel: Albion L. Weeks, District Conservationist, Soil Conservation Service (SCS); Dean Rector, Soil Scientist, SCS; Edwin L. Minnick, Engineering Specialist, SCS; Richard Hyde, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); Judson White, Forester, DEP; F.E. Linkkila, Wildlife Biologist, DEP; Joseph Piza, Fishery Biologist, DEP; Diana Marsh, Sanitarian, State of Connecticut Department of Health; Charles Boster, Planner, Northeastern Connecticut Regional Planning Agency; Barbara Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on August 2, 1973. 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. The 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 Plainfield and the eventual 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.

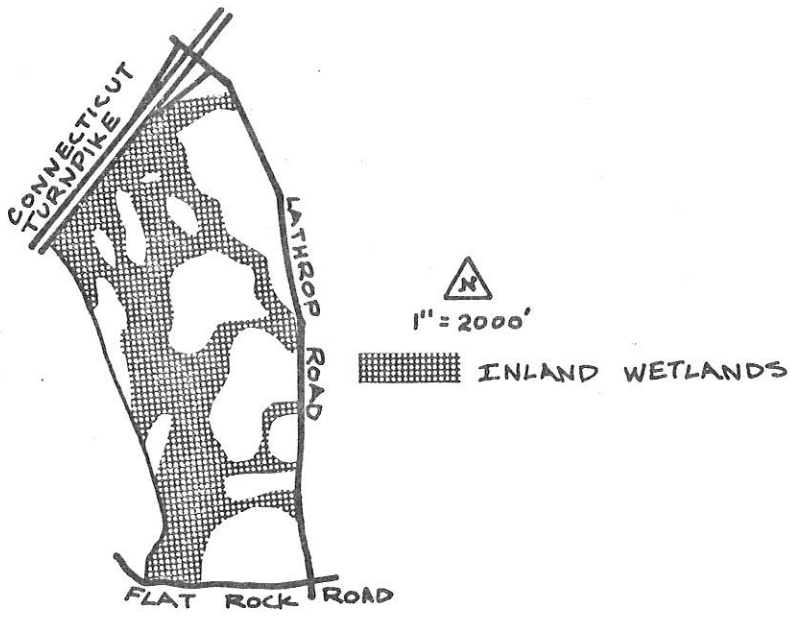
If you require any additional information, please contact: Miss Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

INTRODUCTION

The Plainfield Economic Development Commission has been devoting its efforts in recent months to locating a suitable site for an industrial park within the town. The Commission agreed upon the area just east of Exit 87, the former Lathrop Farm, as being most suitable. The Commission then requested the assistance of the Environmental Review Team in evaluating this land for industrial use.

The site is bounded on the north by the Connecticut Turnpike, on the east by Lathrop Road, on the south by Flat Rock Road, and on the west approximately by the western portion of the Mill Brook floodplain. Mill Brook runs north across the entire length of the property and crosses underneath the turnpike about in the center of that property line.

Approximately half of the site consists of Mill Brook and its associated wetlands all of which is unsuitable for development. These areas are primarily concentrated on the western portion of the property, with the more developable land being adjacent to Lathrop Road. The figure below shows the areas that fall under Public Act 155 as inland wetlands.



The larger unshaded areas along Lathrop Road have the greatest potential for industrial use. This report will deal with the developmental problems likely to be encountered within these areas, as well as with their relation to the surrounding wetlands.

EVALUATION

Soils and Geology

The entire piece of property is covered or underlain by glacial stratified sand and gravel deposits, except for two locations along Lathrop Road where till can be found.* About halfway between the turnpike interchange and Flat Rock Road, the sand and gravel-till contact cuts across the southeast corner of the property. As seen on the soils map in the Appendix, this area is characterized by soils with fragipans; 85M-C, 85M-D, 85X-B, and 85X-C. This portion of the site also rises in elevation, forming part of the valley wall. There is also a small bedrock high about 1,200 feet south of the interchange which exhibits scattered outcrops surrounded by a thin veneer of till material.

The property is more easily discussed if it is divided into two portions. The first includes Mill Brook, its tributaries, and the adjacent floodplain, while the second consists entirely of the terrace of low rolling hills above the floodplain, found mainly adjacent to Lathrop Road.

Within the Mill Brook section, the water table is at or just below the surface of the land. This can easily be seen by referring to the soils map and delineating those soils with high water tables: 91, 123, 193, 464, 43M, and 58. These are all inland wetlands and are shown on the drawing on page 4. The Mill Brook section is a relatively shallow to bedrock stream valley with depths from the land surface to the bedrock being from 30 to 40 feet at the deepest points.** The surface materials include peat, muck, and swamp deposits as well as fine-grained sands and silts in the form of alluvium currently being deposited on the floodplain. Below all of these shallow deposits can be found coarse-grained, glacially deposited sand and gravel, saturated with ground water. These materials are reported as being capable of yielding 100 to 1,000 gallons of water per minute.*** However, because saturated thicknesses and permeability characteristics are variable, the expected yield in many places may fall closer to or lower than 100 gallons per minute.

The second section of the property, which is principally adjacent to Lathrop Road, is a glacially formed terrace consisting of coarse-grained sand and gravel deposits, which have been identified by the Department of Transportation Potential Aggregate

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* Till is predominantly a non-sorted, non-stratified material, deposited directly by glacial action and composed of varying mixtures of boulders, gravel, sand, silt, and clay.

** This is based on a limited number of wells and highway borings reported in the "Quinebaug River Basin Report," Connecticut Water Resources Bulletin No. 9, 1966.

*** "Water Resources Inventory of Connecticut, Part I: Quinebaug River Basin," Connecticut Water Resources Bulletin No. 8, 1966.

Inventory as basically sand and 25 to 50% gravel. Along Lathrop Road, it is estimated there is 320 acre feet of this type material with an average depth of 10 feet. Yields from wells in this area would be similar to those along Mill Brook although yields would tend to decrease as one moves eastward toward the valley wall and the depth to bedrock decreases.

Water Supply

There is a supply line of a local water company within a short distance of the site. It would be quite feasible to extend this water transmission line to serve the proposed industrial park. The quantity of water needed versus the quantity of water available through the water company's system should be analyzed prior to the installation of each industry.

If on-site water is to be utilized, the availability of small to moderately large ground water supplies of good quality should be of no problem. An individual well yielding 100 gallons per minute will produce 144,000 gallons over a 24 hour period. However, yields will ultimately be determined by the aquifer characteristics and the number and placement of wells. Prior to allowing a particular industry to locate within this park, determinations must be made as to the user's water needs and the ability of the aquifer to meet these as well as the total needs of the completed industrial park.

Over-production of this aquifer could result in surface water infiltration from the brook to the ground water system. This would alter the hydrologic system of the drainage basin as well as import surface water quality to pumped well water. For all of the above reasons it is recommended a preliminary subsurface exploratory program be undertaken to assess the quality, value, and limits of the aquifer before industry is allowed to locate within the park.

Waste Disposal

Sewer hookup to the existing municipal sewage treatment plant should be a very high priority item during the development of this site. Delay, causing the use of on-site systems, will only create potential problems in terms of the contamination of the ground water and river systems.

The quality and quantity of the expected effluent versus the capability of the sewage disposal system should be analyzed prior to the installation of each industry. The potential needs of the completed industrial park should also be evaluated. These steps will ensure the existing municipal transmission and treatment facilities are capable of handling the flow from the completed industrial park without reducing the treatment plant's quality of effluent.

If, as suggested, the industrial sites are restricted to the terrace of low rolling hills, the installation of on-site septic systems have only moderate limitations. However, a potential hazard exists with respect to the surrounding ground and surface waters. Though the underlying sand and gravel would permit rapid percolation of septic effluent, minimal renovation of the pollutants would occur, possibly resulting in the contamination and subsequent loss of the aquifer for uses requiring high quality standards. This is of course the extreme case and an end result of this type would depend on the amounts and types of wastes being disposed and the various characters of the ground water system. It seems logical that it is in the best interest of all concerned to protect the water supply by installing municipal sewers.

Foundation Development and Graded Conditions

The sand and gravel terrace deposits along Lathrop Road have a favorable load carrying capability for industrial development. Some of the remaining areas may also have favorable load carrying capabilities, but are restricted by a high water table and/or flooding.

The accumulation and drainage of rainwater from completed buildings and paved surfaces will produce less erosion of the land and alteration to Mill Brook if surface drainage is discouraged. The soils covering the terraces are highly susceptible to erosion and their droughtiness makes it difficult to establish and maintain vegetation. To minimize surface drainage a system could be established to direct runoff to numerous strategically placed dry wells or catch basins with leachfields, pits, or galleries. This would protect the soils from erosion and the brooks from siltation and channel alteration, thus maintaining the fauna and flora within the wetlands as it now exists. Plans for integrated surface and storm drainage should be developed before the start of any construction.

Within the planning phase of the project, the locations for the necessary roads, parking lots, and buildings should be carefully positioned within the terrace areas to maximize the utilization of existing roadways, particularly Lathrop Road. Final grading should leave no slopes greater than one (1) vertical to three (3) horizontal. Slopes steeper than this are difficult to maintain and susceptible to rilling.

The construction phase should be planned to minimize the disruption of existing vegetative cover and to include desirable erosion and sedimentation controls. With the droughtiness of the area and its close proximity to the surrounding high water table, it appears that some sort of inexpensive irrigation system could be employed to aid in the establishment of protective vegetation and possibly improve the aesthetics of the area.

Some assistance may be available from the Soil Conservation Service in reviewing drainage and erosion control plans.

Roads and Utilities

The area would be much better suited for industrial development if the Connecticut Turnpike (Route 52) had a four-way interchange at the Pratt Road crossing. If the industrial park becomes a reality, the State Department of Transportation should make this a high priority project.

Both Pratt and Lathrop Roads would need widening to become the major access to the industrial park. Improvement of the Pratt and Lathrop Road intersection should also be included in the plans. Flat Rock Road might also be upgraded and utilized for access to the park area. Possibly one or two main connectors between Lathrop Road and a short new road adjacent and parallel to Lathrop Road would serve to minimize traffic as well as reduce the need for an extensive road network throughout the site.

Individual access roads to the sites will, in some cases, have to cross the lower flood-prone areas. The elevation of these road crossings should be high enough to ensure safe crossing during flood flows. Culverts should be installed under these roads at their lowest point to insure positive drainage.

Potential Hazards

A. NATURAL: The proposed site is flat with only small topographic changes to differentiate the river system from the tops of the undulating hills. The two brooks running through the property, Mill Brook and Lathrop Brook, have a combined drainage area of 9.05 square miles. Because of the land configuration, the potential for flooding large percentages of this site is quite possible given the occurrence of a large magnitude storm and a condition of high soil saturation. There is evidence of recent flooding of the low areas.

B. MAN-INDUCED: When man's activities increase within a drainage basin, changing property from the natural to a developed condition, it is well known the hydrologic system in turn is altered. It would be difficult, if not impossible, to say how much of the above mentioned flooding is due to natural causes and conversely how much has been man-induced. However, it would be reasonable to assume that future development within the watershed could increase both the frequency and the degree of flooding.

This is not to say that the development of this industrial park will have a devastating flood effect, for the proposed park is only a very small part of the watershed. But it does point out the need for selective placement of buildings, roads, parking lots, and utilities. Sediment, debris, and litter, if allowed to enter

Mill Brook, may be carried to and partially block the culvert under the Connecticut Turnpike, thus exaggerating the flood potential. A comprehensive site evaluation for troublesome erosion and flood areas and the incorporation of protective measures, some of which are mentioned under Foundation Development and Graded Conditions, are needed to prevent or minimize these man-induced hazards.

Some developers might suggest filling some of the low areas, thus making more land available for development. However, filling the low areas will in turn cause higher flood flows in the park and upstream.

Resource Protection

From a strictly forestry standpoint there are no unique situations present on the property. However, it would appear to be to the advantage of all parties concerned to conserve as much of the wooded area on the site as practically as possible both from an aesthetic and an environmental viewpoint. Should it be necessary to develop portions of the wooded acreage on the site, utilization of the forest products rather than destruction of them would be desirable.

The present overall value of the area for fish and wildlife is good, with some areas being excellent. Two small Class A trout streams, Mill Brook and Lathrop Brook, flow through the proposed site. Both streams are stocked by the State. The streambelt area,* with the close proximity of open areas, provides excellent woodcock production habitat. In conjunction with the mixed hardwood upland, the streambelt also provides habitat for other wildlife, such as song birds, small mammals, hawks, and owls.

The fields and reverting old fields with the surrounding shrubs and low wet areas provide very good nesting, feeding, and brook habitat to resident wildlife (rabbit, quail, pheasant, small mammals, song birds, etc.). Two small potholes located near Lathrop Road should be preserved for wetland wildlife.

With the potential wildlife value of the area being very good, sound planning should precede any development. Basic streambelt principles should be followed along Lathrop and Mill Brooks. These principles preclude any major development in the actual streambelt area and encourage enhancement of the area for wildlife use. Planting of various forest trees would enhance the aesthetic value of the streams as well as aid in preserving their quality through temperature and runoff control. Any disturbed areas should be planted with wildlife shrubs; High Bush Cranberry and Autumn

* A streambelt includes the watercourse, lands subject to flooding, adjoining wetlands, and 150 feet beyond the adjoining wetlands.

Olive would do well in these streambelt areas and provide both cover and food. Proper management of the streambelts would encourage its continued use by wildlife as well as furnish enjoyment for people working in the industrial park.

A vegetative buffer strip between Route 52 and the proposed construction area is suggested as a means to soften the effect of the industrial facilities. Species of trees which could be used to create this buffer area include White Pine, Larch, White Spruce, and Hemlock. Assistance in both streambelt management and creation of a buffer strip can be obtained from personnel of the Soil Conservation Service and the Department of Environmental Protection.

Services to Support Development

The Town of Plainfield is one of the four urban/industrial towns in the northeast region of Connecticut. Services and facilities in the town have been developed to continue support of industrial facilities and population concentrations at an urban density.

Within the Town, sewer and water facilities are available with capacity to support the full development of this site for a modern industrial park. The services are not available at the road frontage, but the sewer lines on Route 12 appear to be within reasonable connection distance. With both on-site water supplies and a local water company nearby, there is a more than adequate water supply available.

The Plainfield Volunteer Fire Company is located on Route 12 within 3/4 mile of the industrial park site. Because of the existing industry in this fire company's service area, it would be expected that they are experienced in industrial situations and would be able to man the station during the day and night.

Surrounding Land Uses and Alternative Land Uses for the Area

The surrounding land use in the Lathrop Road area is currently vacant or with only scattered housing nearby. Buffer zones could be considered north and west of the property. These zones could conform with wetlands or lands that are not as developable as the road frontage east and south.

The Lathrop property has been recommended (in draft) for commercial development by the Plainfield Planning and Zoning Commission. This draft report is part of the work to be completed on the Plainfield Plan of Development. The character of the site allows the speculation that many types of development can be recommended and the site developed within good site design practices. Therefore, it appears that the development of this site into a professional industrial park would conform with the draft Plainfield

Plan of Development. The proposed park also conforms to The Regional Plan of Development for Northeastern Connecticut.

Additional Comments and Recommendations

The Mill Brook drainage system drains surface water from a total area of 18.0 square miles before entering the Quinebaug River. This system is basically divided by the Connecticut Turnpike into two nearly equal halves. The Lathrop Brook and Mill Brook systems cover 9.05 square miles east of the turnpike while the remaining 8.95 square miles include the rest of Mill Brook and all of Horse Brook west of the turnpike.

The east and west sides of the turnpike, although differing somewhat in topographical relief and natural soils group, serve as excellent examples of drainage systems before, and after, land has been developed. The land and river system east of the turnpike can be said to be in equilibrium and for this reason erosion, siltation, and sedimentation problems are minimal. The flowing water is clean of chemicals and suspended particles during normal flow and supports a healthy fish population. Development includes only scattered secondary roads and minor residential housing.

The property and river system west of the turnpike exhibit an unstable equilibrium between the forces of erosion and fluid flow caused by a large increase in the impervious surface area in Plainfield Center, and disruption of the protective vegetative covers by sand and gravel extraction. As a result, erosion, siltation, sedimentation, and poor river water quality are all problems easily seen through much of this area.

In order to do a proper study of the problems associated with development of land within a drainage system and to determine the best remedies and preventative methods many factors must be calculated and inventoried. Some of these would include the following:

1. Percent of surface area made impervious (buildings, roads, parking lots, man-made lawns, etc.).
2. Percent of surface vegetation disturbed and left.
3. Measurements of lag time, peak flood flow duration, mean annual flood, etc.
4. Calculation of the percentage of sand and gravel vs. till areas.
5. Water quality measurements.
6. Percentage of area serviced by storm sewers and the location of the outlets.

7. Determination of basin length and slope.

8. Percentage of area serviced by sewage treatment plants, the water sources for service area, and the effluent outlet.

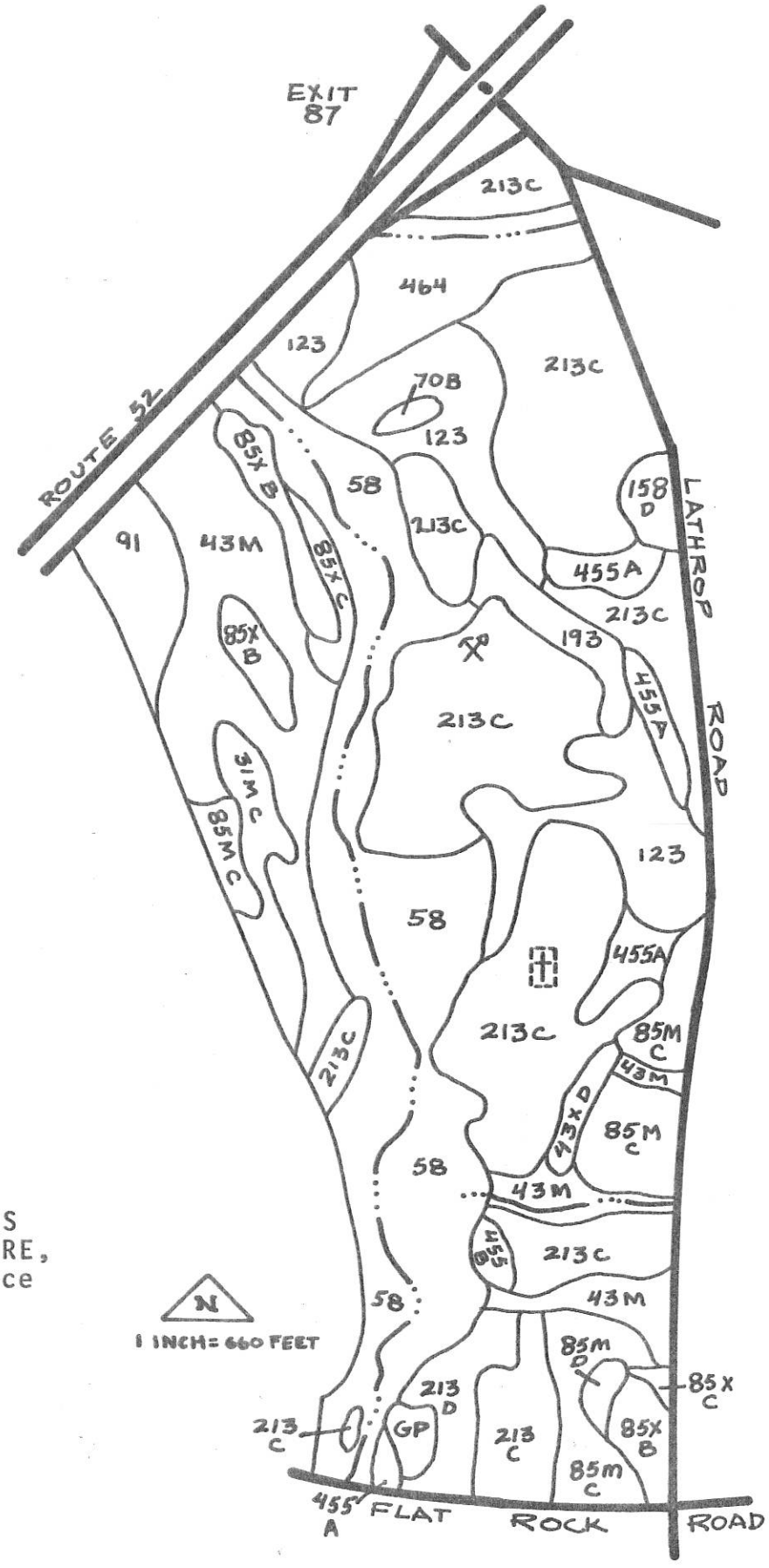
From the above, it is obvious a great deal of work, time, and money can be involved in a study of this nature. However, with the initiation of proper precautions, erosion, siltation, sedimentation, and poor water quality need not be serious problems providing the planning is done in advance of development. With the initiation of the plan, its preventative measures and the incorporation of a system of streambelt buffer zones, few serious problems to the natural conditions should result.

It would appear the town of Plainfield has an opportunity through the properly planned development of this site to create an industrial park, not only capable of broadening its tax base and providing jobs for its citizens, but that fits in with the natural surroundings, preserves important wildlife habitat, maintains excellent trout water and potentially provides the public with a future recreation area. With exclusion of the development from the lowlands and away from the steeper terrace slopes all of these benefits may be had with imaginative total planning.

APPENDIX

SOIL MAP

PROPOSED INDUSTRIAL PARK
PLAINFIELD, CONNECTICUT



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

ADVANCE COPY, SUBJECT TO CHANGE

AUGUST, 1973

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
A-1b	213-C 213-D	65.0	33.2	2	2	3	3	Slope, excessively drained
A-1c	158-D	1.5	.8	3	3	3	3	Slope, excessively drained
A-1d	70-B	.5	.3	1	1	2	1	Droughtiness
A-2	455-A 455-B	6.4	3.3	2	2	2	2	Seasonal high water table
A-3b	91	5.0	2.6	4	4	4	4	High water table organic material
B-3a	43X-D	1.2	.6	3	3	3	3	Seasonal high water table, stoniness
B-3b	43M	20.9	10.7	4	4	4	4	High water table, Stoniness
C-1a	85X-B	8.0	4.1	2	1	1	1	Fragipan
C-1b	85X-C	2.0	1.0	2	2	2	2	Fragipan
C-1c	85M-C 85M-D	13.1	6.7	2	2	3	3	Stoniness, slope, fragipan
C-2b	31M-C	4.0	2.0	3	3	3	3	Seasonal high water table, stoniness, fragipan
E-3a	58	39.0	19.9	3	3	3	3	Variable drainage and texture
F-1	193	3.2	1.6	4	4	4	4	High water table, organic material
G-3a	464	7.5	3.8	3	3	3	3	High water table
G-3b	123	17.5	8.9	4	4	4	4	High water table
Not Classified	GP	1.0	.5	This is an area of previous extraction. Suitability can only be determined by on-site inspection.				

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

** Limitations: 1-slight; 2-moderate; 3-severe; 4-very severe.

ACREAGE SUMMARY OF SOILS LIMITATIONS

	Slight		Moderate		Severe		Very Severe	
	Acres	%	Acres	%	Acres	%	Acres	%
On-Site Sewage	.5	.3	94.5	48.3	53.2	27.1	46.6	23.8
Basements	8.5	4.4	86.5	44.2	53.2	27.1	46.6	23.8
Landscaping	8.0	4.1	8.9	4.6	131.3	67.0	46.6	23.8
Streets and Parking	8.5	4.4	8.4	4.3	131.3	67.0	46.6	23.8