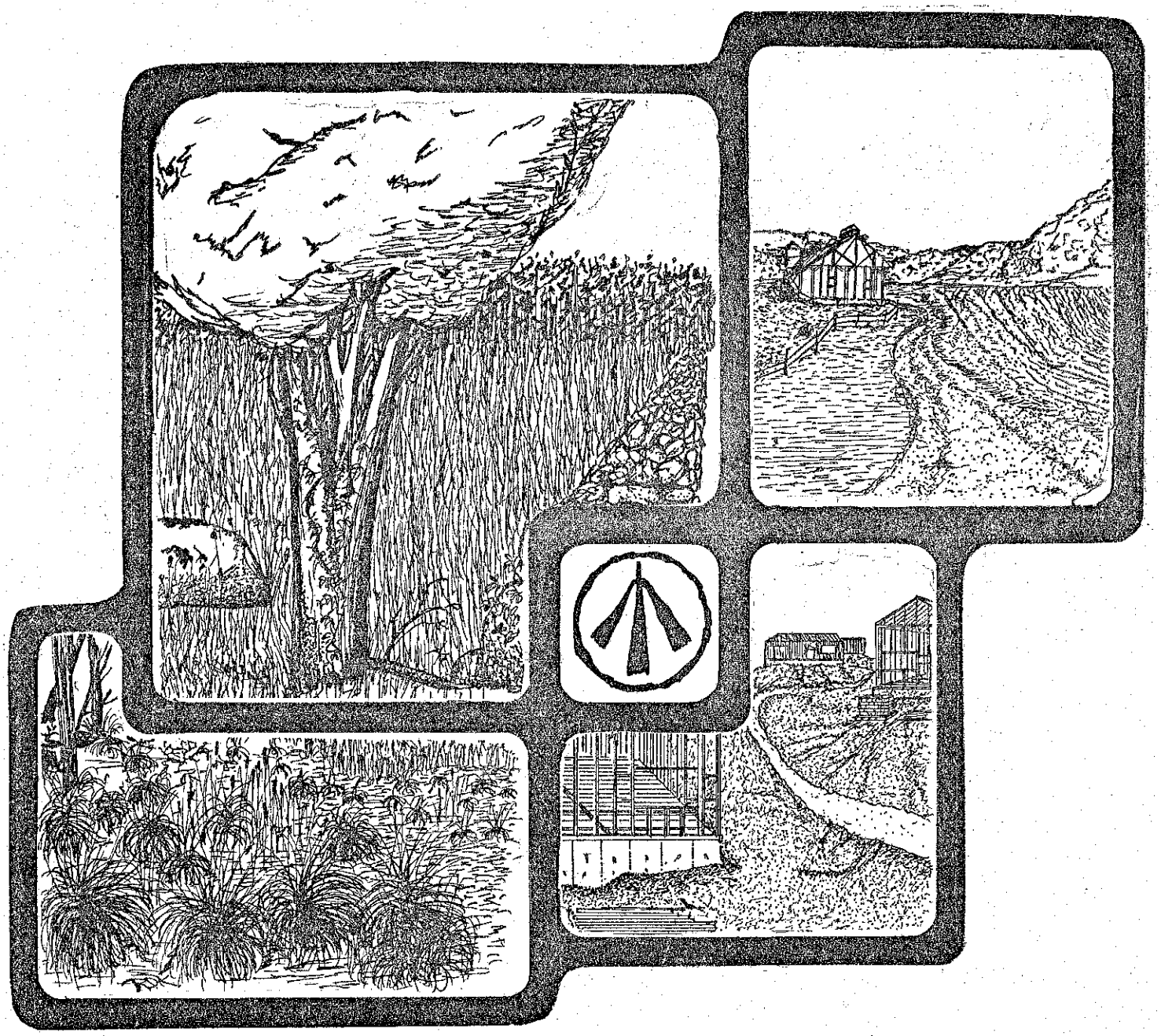
ENVIRONMENTAL REVIEW TEAM REPORT



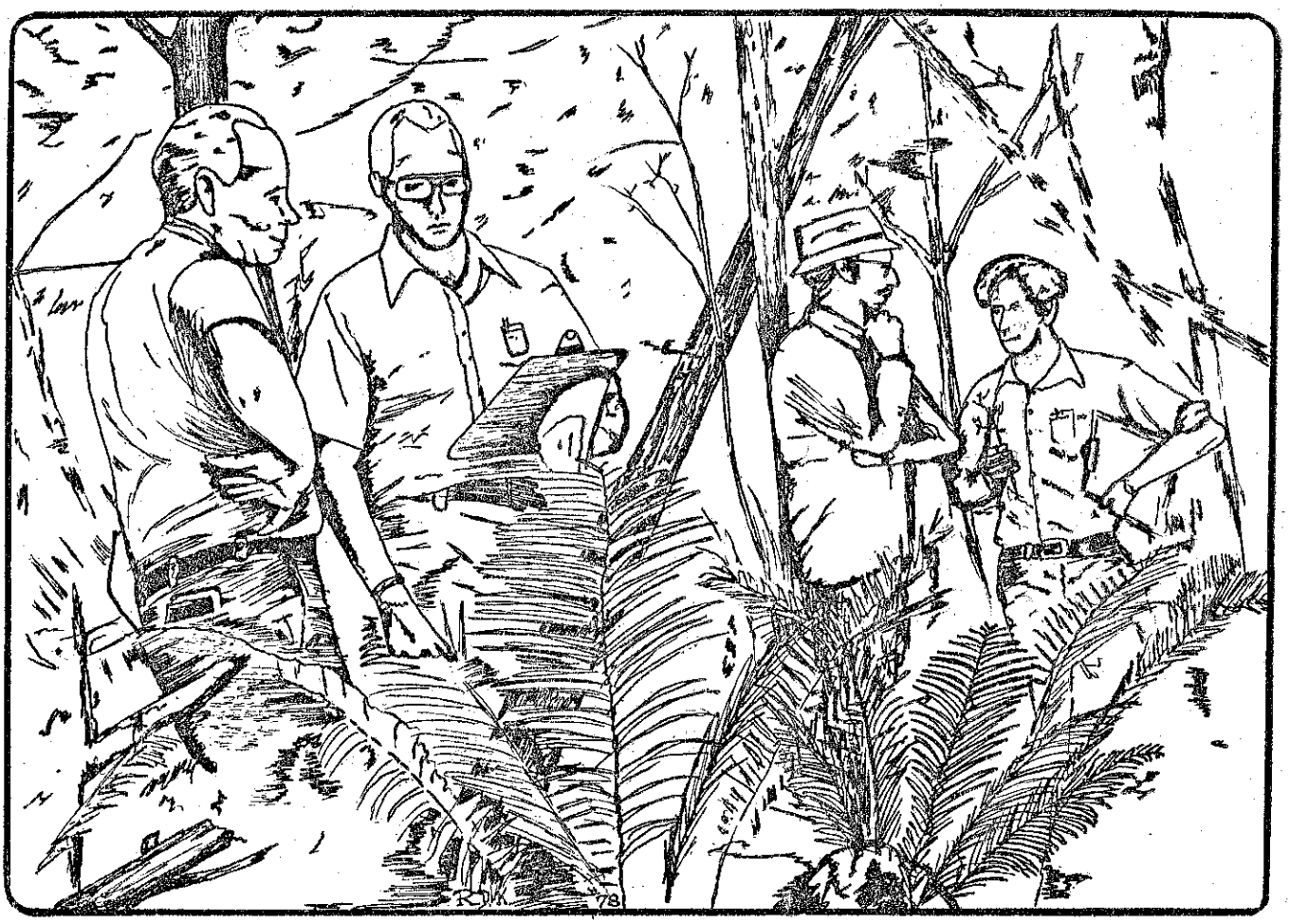
PROPOSED INDUSTRIAL PARK AREAS
BEACON FALLS, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION & DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

ON

PROPOSED INDUSTRIAL PARK AREAS
BEACON FALLS, CONNECTICUT



SEPTEMBER 1980

King's Mark Resource Conservation and Development Area

Environmental Review Team

P.O. Box 30

Warren, Connecticut 06754

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team operates through the cooperative effort of a number of agencies and organizations including:

Federal Agencies
U.S.D.A. SOIL CONSERVATION SERVICE

State Agencies
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEPARTMENT OF HEALTH
DEPARTMENT OF TRANSPORTATION
UNIVERSITY OF CONNECTICUT COOPERATIVE EXTENSION SERVICE

Local Groups and Agencies
LITCHFIELD COUNTY SOIL AND WATER CONSERVATION DISTRICT
NEW HAVEN COUNTY SOIL AND WATER CONSERVATION DISTRICT
HARTFORD COUNTY SOIL AND WATER CONSERVATION DISTRICT
FAIRFIELD COUNTY SOIL AND WATER CONSERVATION DISTRICT
NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY
VALLEY REGIONAL PLANNING AGENCY
LITCHFIELD HILLS REGIONAL PLANNING AGENCY
CENTRAL NAUGATUCK VALLEY REGIONAL PLANNING AGENCY
HOUSATONIC VALLEY COUNCIL OF ELECTED OFFICIALS
AMERICAN INDIAN ARCHAEOLOGICAL INSTITUTE

x x x x x x

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Stanley J. Pac, Commissioner

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KING'S MARK RESOURCE CONSERVATION AND DEVELOPMENT AREA

Victor Allan, Chairman, Executive Committee
Stephen Driver, ERT Committee Chairman
Moses Taylor, Coordinator

Staff Administration Provided By

NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY

Leicester H. Handsfield, Chairman
Charles A. Boster, Director
Richard Lynn, ERT Coordinator
Rebecca West, ERT Cartographer
Irene Nadig, Secretary
Patricia Dyer, Secretary

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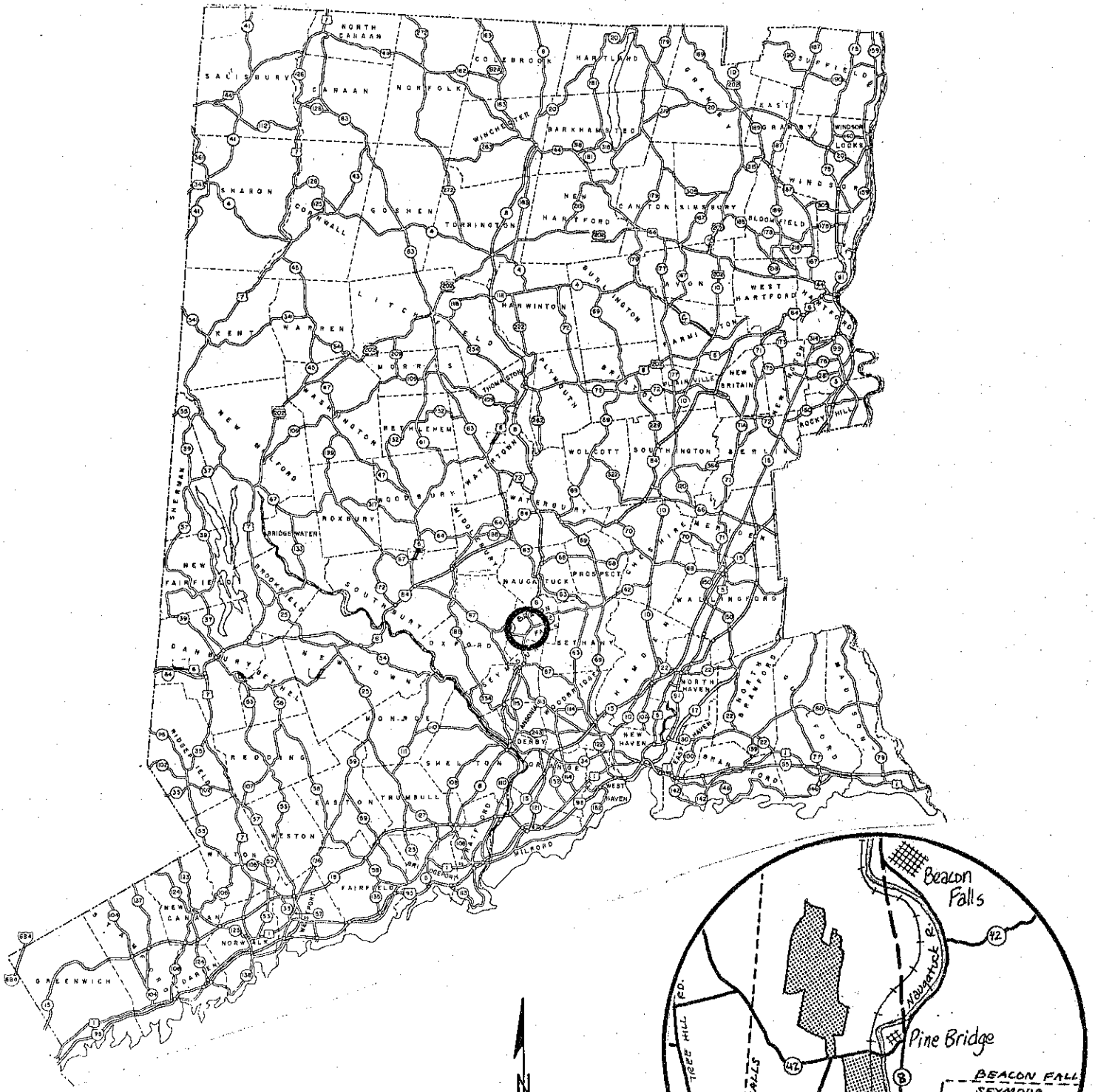
BEACON FALLS, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT
ON
PROPOSED INDUSTRIAL PARK AREAS
BEACON FALLS, CT.

I. INTRODUCTION

The Beacon Falls Economic Development Commission is presently exploring the feasibility of creating a ± 340 acre industrial park in the west-central portion of town. The subject site, shown in Figure 1, is located just west of the Naugatuck River. For convenience, the site may be viewed as consisting of a ± 130 acre northern parcel (north of Rte. 42) and a ± 210 acre southern parcel (south of Rte. 42).

As shown in Figure 1, the topography of the northern parcel is diverse. The southern third of this parcel, which has been mined for sand and gravel, is generally flat. The northern two thirds of this property consists of a narrow central valley with the land rising steeply to the east and west.

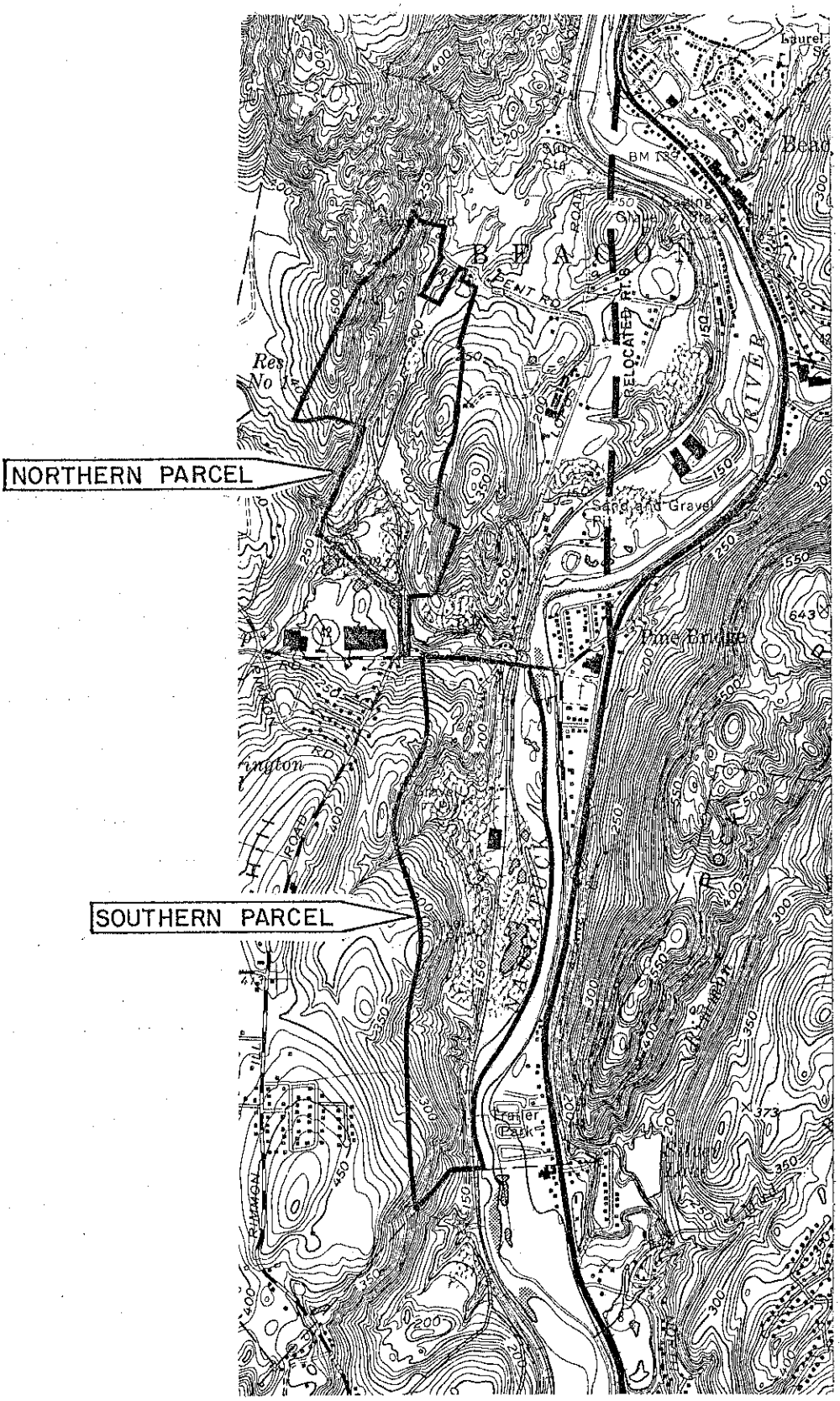
The southern parcel of the proposed industrial park is characterized by steeply sloping wooded land on the western half and slightly to moderately sloping land on the eastern half. Much of the flatter land on this section has been created by earth excavation and the present mining operation on this parcel will result in the creation of much more flat land as the hillside is removed.

Access to both parcels is available off Rte. 42. The northern section is also accessible from the north via Pent Road. The relocation of Rte. 8 in Beacon Falls is expected to enhance access and industrial park development potential in both the northern and the southern parcels. It should also be noted that an operative Conrail line, running from Torrington to Milford bisects the southern parcel (see Figure 1).

The proposed industrial park is in the preliminary planning stages. Presently only a portion of the subject area is zoned for industrial use. The First Selectman of Beacon Falls and the Chairman of the Town Economic Development Commission requested the assistance of the King's Mark Environmental Review Team to help the town in analyzing the suitability of this property for industrial park development. Specifically, the ERT was asked to prepare a report discussing the environmental factors which will facilitate or limit industrial development of this land. This information was requested to assist the town in planning for environmentally sound industrial development. The King's Mark Executive Committee considered the town's request and approved the project for review by the Team.

FIGURE 1.

TOPOGRAPHIC MAP



SCALE: 1" = 2000'

0 1/2 1 mile

0 2000' 4000' 6000'

The ERT met and field reviewed the site on May 21, 1980. Team members for this review consisted of the following:

Brian Curtis	Sanitary Engineer	Connecticut Department of Environmental Protection
Frank Indorf	District Conservationist	U.S.D.A. Soil Conservation Service
Rob Rocks	Forester	Connecticut Department of Environmental Protection
Charles Vidich	Regional Planner	Central Naugatuck Valley Regional Planning Agency
Mike Zizka	Geohydrologist	Connecticut Department of Environmental Protection

Prior to the review day, each team member was provided with a summary of the proposed project, a checklist of concerns to address, a detailed soil survey map, a soils limitation chart, and a topographic map. Following the field review, individual reports were prepared by each team member and forwarded to the ERT Coordinator for compilation and editing into this final report.

This report presents the team's findings and recommendations. It is important to understand that the ERT is not in competition with private consultants, and hence does not perform design work or provide detailed solutions to development problems. Nor does the team recommend what ultimate action should be taken on a proposed project. The ERT concept provides for the presentation of natural resources information and preliminary development considerations--all conclusions and final decisions rest with the town. It is hoped the information contained in this report will assist the town of Beacon Falls in making environmentally sound decisions.

If any additional information is required, please contact Richard Lynn, (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P.O. Box 30, Warren, Connecticut 06754.

* * * * *

II. GEOLOGY

The proposed Beacon Falls industrial parcels are located in the Naugatuck topographic quadrangle. The Connecticut Geological and Natural History Survey has published maps and reports on the bedrock geology (Quadrangle Report No. 9, by M. H. Carr, 1960) and the surficial geology (Quadrangle Report No. 35, by R. F. Flint, 1978) of that quadrangle. Figures 2 and 3 show the geology of the two parcels as adapted from these publications.

Two major types of bedrock are found within the sites: Prospect Gneiss and the Straits Schist. Prospect Gneiss is a medium-to coarse-grained, dark gray gneiss composed largely of the minerals quartz, plagioclase, and biotite, with lesser amounts of hornblende, microcline, sphene, and garnet. The term "gneiss" refers to a lineation or foliation in the rock that is caused by the alignment of elongate minerals into thin bands or layers. In this rock, the lineation is produced by the alignment of biotite and hornblende. Large, blocky masses of feldspar or quartz crystals distort the lineation in many places. The normally sized feldspar and quartz grains impart a granular texture to the rock. Prospect Gneiss is presently being quarried extensively in the southern parcel.

The Straits Schist is described as a coarse to very coarse, flaky, brown-weathering, biotite-bearing muscovite schist. Quartz is actually the predominant mineral component, constituting between 35 and 65 percent of the rock. Muscovite, biotite, and plagioclase are present in approximately equal amounts (10-25 percent); garnet, chlorite, sericite, magnetite, and kyanite are minor components. The term "schist" refers to the pronounced foliation in the rock, caused by the layering of the mica minerals. The Straits Schist is the most resistant local rock and forms the highest peaks in the area (e.g. Rock Rimmon).

With the noteworthy exception of the quarry in the southern parcel, bedrock in most parts of the proposed industrial sites is covered by unconsolidated glacial sediments or by stream deposits of more recent vintage. Two major types of glacial sediments are present: till, which was deposited directly from the ice, and stratified drift, which was deposited by meltwater streams. Because of the difference in their respective modes of origin, till and stratified drift usually have markedly different textural characteristics. Till is generally nonsorted, containing an undifferentiated mixture of clay, silt, sand, gravel, and boulders. Stratified drift, in contrast, is normally characterized by grain size sorting and layering. Although stratified drift may contain particles of many sizes, an individual layer (which may be as thin as a millimeter or as thick as several meters) will usually contain similarly sized grains. Gravel and sand are the major components of the stratified drift in the area; the sand, however, is very fine in some areas. Stratified drift has been extensively mined in both parcels, and is still being mined in the southern parcel.

Alluvium is found along Naugatuck River in the southern site. This deposit is relatively thin and caps thick accumulations of stratified drift in the valley. Alluvium was deposited by Naugatuck River during flood stages and includes sand, silt, gravel, and some man-made debris from the great flood of 1955.

FIGURE 2.

BEDROCK GEOLOGY (adapted from CGNHS Quad. Rpt. No. 9)

EXPLANATION

PROSPECT GNEISS

THE STRAITS SCHIST

(SEE TEXT FOR DESCRIPTION OF ROCK TYPES)

N

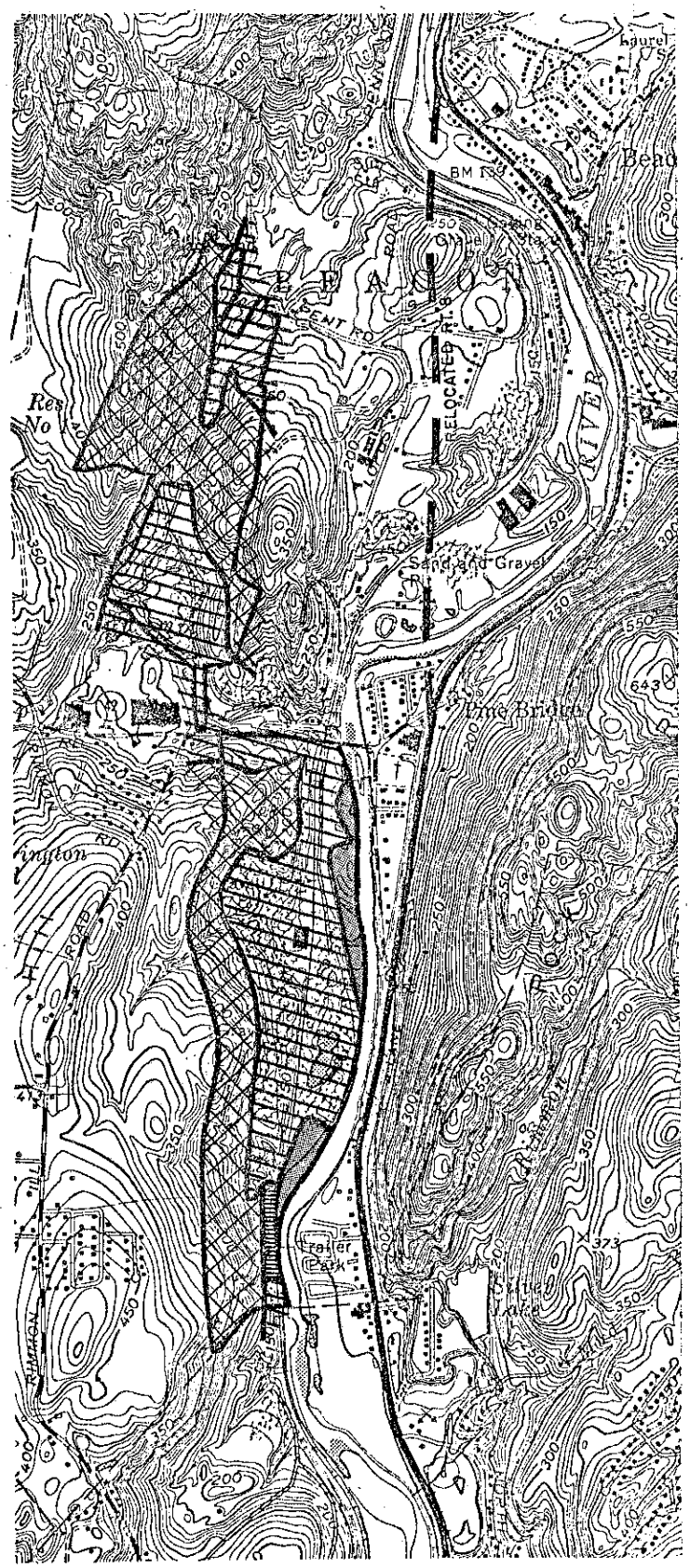
SCALE: 1" = 2000'

0 1/2 1 mile

0 2000' 4000' 6000'

FIGURE 3.

SURFICIAL GEOLOGY (adapted from CGNHS Quad. Rpt. No. 35)



EXPLANATION

TILL (GENERALLY LESS THAN 10' THICK) AND NUMEROUS AREAS OF BEDROCK EXPOSURE, PARTICULARLY IN THE SOUTHERN PARCEL.

STRATIFIED DRIFT

ALLUVIUM

ARTIFICIAL FILL

N

SCALE: 1" = 2000'

0 1/2 1 mile

0 2000' 4000' 6000'

In general, the thickest accumulations of overburden occur in the Naugatuck River valley. Test holes drilled in the Pine Bridge area revealed as much as 80 feet of unconsolidated material (mostly stratified sand and gravel) over bedrock. The thickness of the stratified drift in the northern parcel is not known, but estimates of 30-50 feet for maximum thickness are probably reasonable. Till thicknesses are variable, but in general the till appears to be less than 10 feet thick. The extensive mining and quarrying operations may be expected to reduce substantially the amount of overburden remaining in the two sites. As a result, depths to bedrock in the western portion of the southern parcel, depths to groundwater in the eastern section of the southern parcel, and depths to groundwater in the stratified-drift areas of the northern parcel may depend largely on the amount of fill brought in to regrade these areas.

III. SOILS

A Soils Map of the subject site is presented in the Appendix of this report. The Appendix also includes a Soils Limitation Chart which identifies limiting factors for various land uses on individual soil types. By comparing the Soils Map with the Soils Limitation Chart, one can gain an appreciation of the suitability of the soils in their present condition for industrial development. It should be remembered however that much of the southern parcel is currently being mined. As a result, the landscape and soils will be drastically altered. As a general rule, this earth excavation will make the land more suitable for industrial development as gentler land grades will be attained.

By the time the mining operation is completed, nearly the entire southern parcel will be classified as a gravel pit and/or quarry. While construction cost will be reasonable in the sandy gravelly areas, construction costs in the shallow to bedrock areas will likely be high due to site development costs plus the installation of water, sewer, and storm drainage systems. Costs for road construction on the site should be average.

The southern half of the northern parcel also appears well suited to industrial development. The HSE and RP soil areas in the northern half of this parcel (see Soils Map) present severe limitations for industrial development however due to steep slope and shallow to bedrock conditions. Without excessive earth excavation, these areas are considered unsuitable for industrial development. The northeastern corner of the northern parcel does have a $\pm$ 8 acre area of soils suitable for industrial development. This area is mapped as AFB and PbC. Access to this area is available off Pent Road. It is also probable that this area could be linked to the southern portion of this site by improving the existing road running through the central portion of the property.

Industrial park development in either the northern or southern parcels should include plans for erosion and sediment control prior to any construction. The New Haven County office of the Soil Conservation Service is available for technical assistance in developing and reviewing erosion and sediment control plans.

IV. HYDROLOGY

NORTHERN PARCEL

The northern parcel is drained by Hemp Swamp Brook, which flows along the southern border of the site, and an unnamed tributary stream, which traverses the southern portion of the parcel before joining Hemp Swamp Brook at the southeastern corner of the site. The unnamed stream is the drainage outlet from the Seymour Reservoir system. Hemp Swamp Brook itself is tributary to Naugatuck River. As increased amounts of runoff resulting from industrial development could cause flooding problems to homesites downstream of this site, it is important that a storm water management plan be prepared for this area prior to any development. In this regard, consideration should be given to utilizing the existing ponds on the western edge of the property as stormwater retention basins.

The stratified drift deposits in the southern section of the northern parcel appear to have a moderate potential for high-yielding groundwater wells. Much of the material observed during the field review consisted of very coarse gravel which transmits water very rapidly. Most of the coarser sediments may have been removed during excavation, but other gravelly layers may be present at depth. Elsewhere in this section, a deposit of very fine sand and silt was observed. The exact nature of the bulk of the remaining stratified drift is consequently difficult to predict. It may, therefore, be worthwhile to drill a few exploratory wells in this section to assess the aquifer potential of the stratified drift. A finding of highly productive zones in the deposit may cause the town to reconsider the use of this section of the northern parcel for industrial development, or at least to decide to limit usage of the site to businesses or industries that would not generate much waste and would be less likely to pollute the groundwater. Coarse sediments, by virtue of their ability to transmit groundwater rapidly, are also more likely to allow contaminants to reach and diminish the quality of the groundwater. In addition, the water table may be near the surface in the excavated area, enhancing the potential for pollution.

The groundwater resources of the till-bedrock areas of the northern parcel are not likely to have a significant potential for public water supplies. However, development of these areas may influence the groundwater quality in the adjacent stratified drift. Because of the steep slopes and bedrock, these areas will require considerable amounts of blasting, filling, grading, and other types of site preparation before development becomes feasible. All of these activities may influence groundwater quantity and quality. Extreme care would be necessary to prevent deterioration of groundwater quality in these areas because bedrock, which undoubtedly would be exposed in most places, has little effectiveness in purifying groundwater (as opposed to most natural soils, which may be highly effective). Hence, purification of septic system leachate or other discharges would depend upon the nature of the final fill.

In the northern parcel, approximately 20-25 percent of the total area is stratified drift with the remainder being thin till and bedrock. The stratified drift areas pose no substantial hindrances to development while the other areas would require a considerable amount of site preparation.

SOUTHERN PARCEL

The southern parcel drains either directly or via seasonal streams into Naugatuck River. Stormwater management on the site doesn't appear to present

any great problems due to the proximity of Naugatuck River. Run-off from this area could be piped directly into the River without causing any adverse impacts on the upstream and downstream areas along the River. It will of course be necessary to properly size the stormwater drainage system on the site to adequately handle stormwater runoff.

The area lying east of the railroad in the southern parcel may have a high water-supply potential. The present owners of the site have proposed removing enough of the stratified drift in that area to allow Naugatuck River to flood it, creating a lake-like bulge in the river. Such a use may preclude the establishment of a drinking-water supply well in the stratified drift. The town may wish to drill a few test wells in the deposit to analyze its water-supply potential before a decision to flood the area is finalized. It should be noted that Naugatuck River's quality may influence the quality of well-water withdrawn from this area. In addition, the stratified drift in the valley is known commonly to produce groundwater with objectionably high concentrations of iron or manganese (source: Connecticut Water Resources Bulletin No. 19).

Other factors should be weighed in evaluating the desirability of the proposed lake. Among the most important are the effects on Naugatuck River's flow rates and water temperatures. Because of the river's expanded width, a considerable volume of additional flood storage space would be provided. During periods of heavy rainfall, the space would mitigate downstream flood flows to some extent (probably a minor extent though since the upstream drainage area of the river is very large - approximately 261 square miles).

In warm, sunny weather, the expanded surface area of the river would allow increased evaporation, raising the water temperature and further concentrating the load of suspended and dissolved materials. In addition, flow velocities will be reduced in the lake, and sediment would be deposited at the inlet. Furthermore, the creation of the lake would bring the waters of Naugatuck River much closer to the actual industrial sites, increasing the potential for contamination of the river. Hence, in sum, the proposed river modifications would be expected to have a slight beneficial effect on flooding problems, mostly in the immediate vicinity of the lake, and a slight to moderate adverse effect on water quality in the river. More detailed analyses of these potential effects should accompany any more detailed plans to initiate this proposal.

Most or all of the industrial activity in the southern parcel would be confined to the area west of the railroad. This area, now being quarried, presents considerations as to groundwater quality that are similar to those discussed above in relation to the till-bedrock sections of the northern parcel. In the southern parcel, however, most of the necessities for site preparation are already being accomplished through the quarrying operation.

V. WATER SUPPLY

As discussed in the Hydrology section of this report, stratified drift areas exist within both parcels that may have potential for high-yielding groundwater wells. Industrialization of these areas may diminish their possible usefulness for drinking-water purposes, but not necessarily for other industrial needs. Only further testing of these sediments can provide the essential data for the town's analysis of the best possible use of these areas.

In terms of industrial drinking-water supplies, it may be possible to develop individual on-site wells or one or more community wells, but extension of public water mains probably would be the better alternative, assuming the economic feasibility of the latter. The risk of contamination of both a stratified drift well and a bedrock well exists on these sites, for reasons outlined more fully in the Hydrology section. Nevertheless, it should be possible to employ precautionary techniques in the development of either site that would adequately protect a subsurface (particularly bedrock) water supply. For instance, all storm drainage from buildings, parking lots, and roads could be collected and discharged downgradient from wells.

VI. WASTE WATER DISPOSAL

Soil Suitability for Sub-Surface Sewage Disposal

Determination of the suitability of soils within the proposed industrial park for sub-surface sewage disposal has been based upon soils information contained in the SCS Soil Survey of New Haven County. This information indicates that approximately 50% of the northern parcel is generally unsuitable for this purpose. Restricting factors include steep slopes, rock outcrops, shallow soil conditions and substrata soils of low permeability. The southernmost section of the northern parcel has soils which may prove to be suitable. The only foreseeable restrictions for this southern-most section would be possible high groundwater conditions or the excessive permeability of sand and gravel deposits encountered in this area. Highly permeable soils may not provide proper renovation of sewage prior to its entering the soil groundwater system. The northeastern corner of the northern parcel also appears to have soils which are suitable for subsurface sewage disposal. The only wastewaters which would be suitable for disposal in both of these areas would be domestic sewage, minor cooling or clean water, effluents containing substances of natural origin, or materials which easily biodegrade in the soil system. Subsurface disposal of sewage must not pose any threat to untreated drinking water supplies drawn from the groundwater outside of the zone of influence of any such discharge.

Approximately 50% of the southern industrial parcel is also unsuitable for sub-surface sewage disposal for the same reasons as noted above; rock-outcrops, steep slopes, shallow soil and low permeability substrata. For the remaining suitable areas the same restrictions and discharge characteristics as required for the northern parcel would apply.

Feasibility of Extending Public Sewers to the Proposed Industrial Areas

The Beacon Falls sewage treatment plant (STP), has a design capacity of 500,000 gallons per day (gpd) and provides conventional biological treatment. The present average daily flow to the plant is 263,000 gpd, which leaves an excess capacity of approximately 237,000 gpd. Values of flow estimates for industrial zoned land commonly range from 700-2000 gallons per acre per day (gpad). Based upon the proposal of 340 acres of industrial zoned land, a flow allowance of 697 gpad would bring the STP to its design capacity. This estimate considers building on the total area of proposed industrial land. Due to site constraints a more realistic estimate would allow 50% development on the northern site and 50% on the southern site for a total of 170 acres. An industrial allowance of 1395 gpad could be used on this basis which would bring the STP

to its design capacity. Prior to committing all excess STP capacity to future industrial use; the Beacon Falls Water Pollution Control Authority should first determine what portion of excess STP capacity should be reserved for other needs of the Town. This would include sewage contributed from future problem areas, commercial establishments, high density residential areas, etc.. It should also be pointed out that sewage introduced to the STP should be amenable to the treatment provided by that plant (biological). Other wastewaters such as metal plating waste, cooling water, or non degradeable wastewaters should be treated at the individual industry and discharged to a class B watercourse. A National Pollutant Discharge Elimination System (NPDES) Permit and a State Discharge Permit would be required for any stream discharge and each would be evaluated by the Department of Environmental Protection on a case by case basis. The reason that treated non-biodegradable wastewater is unsuitable for discharge to the Beacon Falls STP is that no further degree of treatment is provided at the plant. Discharges of this nature would only take up hydraulic capacity at the plant which could be used by some treatable wastewater instead. Stream discharges of treated wastewater are only possible to class B watercourses. Only in the southern industrial parcel would this be possible due to the proximity of the Class B Naugatuck River. The only streams crossing the Northern parcel are two small class A streams. Due to this classification and small flow volume, the discharge of treated wastewaters of any type would not be permitted. As a result the Central Naugatuck Valley Regional Planning Agency recommends that zoning of this parcel be limited to "dry industries" having only a sanitary wastewater discharge.

Construction of public sewers to serve these two industrial parcels would be feasible, but due to surface elevations a number of pump stations would be required. It is not anticipated that funding for sewer construction on these parcels through the State-Federal Construction Grant Program would be available due to the low ranking such a project would receive on the funding priority list relative to other sewer projects.

Water Quality Concerns

The northern parcel of the proposed industrial park is located in an area of high water quality with a majority of the area within the watersheds of class A tributaries of the Naugatuck River. A small section of approximately 4 acres along the northwestern boundary of the parcel is within the watershed of class AA Seymour Reservoirs #1 and #2. This portion of the site, which is tributary to the Seymour Reservoirs, should be left as undeveloped land in its natural state. The detrimental effect of pollutants entering a public water supply reservoir from an industrial establishment far outweigh any benefits which may be derived from development of this small area. In addition, steep slopes and outcrops of ledge would make the site difficult for any building or road construction.

As discussed in the hydrology section of this report, virtually all of the southern industrial site is tributary to the Naugatuck River. It should be noted that the groundwater in the vicinity of Nutmeg Bakery is contaminated due to the past illegal dumping of chemicals. On-site development of a potable water supply would not be recommended for this area of the southern site. The relatively flat land areas along the Naugatuck River within the southern industrial site have been identified by the Connecticut "208" program as containing a stratified drift aquifer with potential for public water supply.

If the Town proceeds with industrial development of this property, consideration should be given to developing safeguards to protect against the potential detrimental impact a particular industry might have upon surface and groundwater quality. This would vary from one industry to the next depending upon the quantity and nature of materials they may generate, transport, or store on the site. A useful guide which local commissions and agencies may use for conducting a first cut evaluation of a specific industrial type is the "Industrial Site Constraint Manual", prepared by the Connecticut "208" Program. This manual is available from the Central Naugatuck Valley Regional Planning Agency.

Although the hazardous waste regulations of the Resource Conservation and Recovery Act will address the transport, generation, storage, treatment and disposal of the majority of hazardous wastes, certain categories of small users will not fall under the same requirements as major users. The Town should take upon itself the responsibility of ensuring that these small sources do not pollute water resources. The Department of Environmental Protection would be available for assistance on questions the Town may have in evaluating a specific industrial development proposal.

VII. VEGETATION

The two parcels proposed for potential industrial park development by the town of Beacon Falls may be divided into six vegetation areas. These include mixed hardwoods, 146± acres; gravel/waste areas, 129± acres; smoothed gravel/floodplain, 21± acres; old field, 16± acres; softwoods/hardwoods, 11± acres and open fields, 8± acres (see Vegetation Type Map and Vegetation Type Descriptions). Steep slopes and shallow to bedrock soils severely limit forest management options on these parcels. As areas are cleared for industrial development, utilization of the trees for fuelwood would be desirable. Revegetation of cleared areas as soon as possible will help to reduce runoff and erosion problems and also improve area aesthetics.

Vegetation Type Descriptions

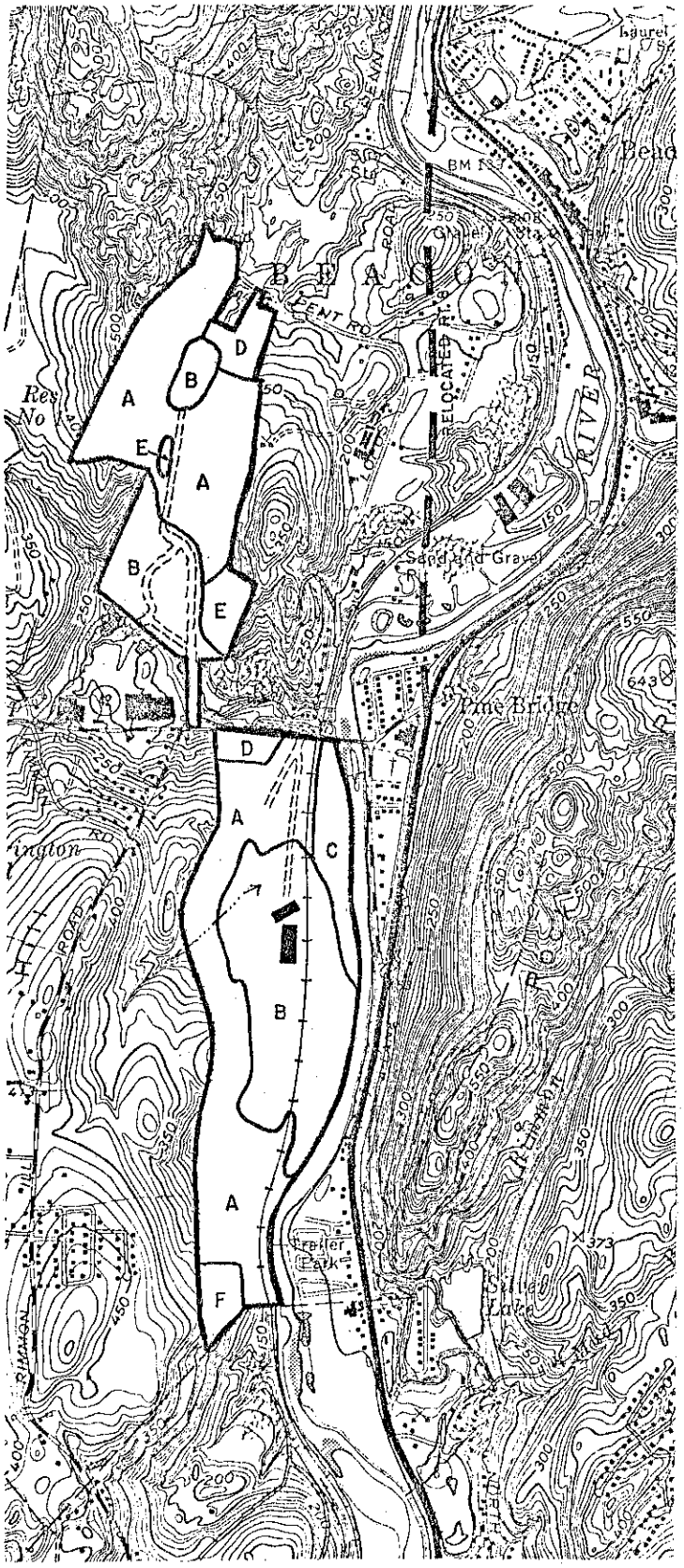
TYPE A. MIXED HARDWOODS. This variable stand is approximately 146 acres in size and is for the most part fully stocked with pole to small sawtimber-size black oak, chestnut oak, white oak, shagbark hickory, red maple, and black birch. In the driest areas, many trees are unhealthy and somewhat malformed, probably as a result of poor moisture conditions brought about by the extremely shallow to bedrock soils. Pole to sawlog-size red maple, yellow birch and eastern hemlock are present in the small wet areas which are scattered throughout this stand. The understory present in this stand is made up of maple-leaved viburnum, arrowwood, witch hazel, hardwood tree seedlings and dense patches of mountain laurel. Canada mayflower, Christmas fern and club moss form the ground cover in this stand.

TYPE B. GRAVEL AREAS. Approximately 129 acres of this tract have been mined for gravel or rock. Vegetation is completely lacking in recently excavated and heavy use areas. In other areas sweet fern, bayberry, gray birch seedlings, aspen seedlings, grasses, goldenrod, assorted weed species and mosses are becoming established.

TYPE C. SMOOTHED GRAVEL/FLOODPLAIN AREA. This 21± acre area was mined for sand and gravel and then smoothed. This area is flooded seasonally by the Naugatuck River, however some shrub species have become established; these

FIGURE 4.

VEGETATION TYPE MAP



VEGETATION TYPE DESCRIPTIONS*

Type A — Mixed hardwoods, 146 acres, fully stocked, pole to sawtimber size.

Type B — Gravel areas, 129 acres, pioneer plant species.

Type C — Smoothed gravel/flood plain, 21 acres, shrub species.

Type D — Old field, 16 acres, understocked, sapling size.

Type E — Softwood/hardwood, 11 acres, fully stocked, pole to sawtimber size.

Type F — Open fields, 8 acres, grasses.

LEGEND

Vegetation type boundary

Existing buildings

Gravel road

N

SCALE: 1" = 2000'

0 1/2 1 mile

0 2000' 4000' 6000'

*Seedling size - trees less than 1" in diameter at 4½' above the ground (d.b.h.)
Sapling size - trees 1" to 5" in d.b.h.
Pole size - trees 5" to 11" in d.b.h.
Sawtimber size - trees 11" and greater in d.b.h.

include silky willow, red stemmed dogwood, arrowwood and spirea. Grasses, sedges and scattered goldenrod have also become established.

TYPE D. OLD FIELD. The old field areas which total 16± acres are at present understocked. Sapling size eastern red cedar, gray birch, black oak and red maple are present but widely spaced. Black cherry seedlings, black birch seedlings, multiflora rose and gray stemmed dogwood are scattered throughout. Grasses, goldenrod, black-eyed Susans and ox-eye daisy are dominant.

TYPE E. SOFTWOODS/HARDWOODS. This 11 acre stand is fully stocked with pole to sawtimber-size eastern hemlock, black birch, and black oak. Hemlock seedlings and patches of mountain laurel make up the understory in this stand. Ground cover consists of Canada mayflower and scattered Christmas fern.

TYPE F. OPEN FIELDS. Grasses are the dominant form of vegetation on this 8 acre open field.

Limiting Conditions for Vegetation Management

The vegetation on this site is primarily limited by the excavation of sand and gravel which has left a relatively sterile and topsoil free surface. This area, which is designated on the vegetation type map as gravel areas, is continously being expanded. Heavy use by machinery over some of this area prevents even the rugged pioneer species from becoming established.

The majority of the forested areas (Vegetation types A and E) have steep slopes and rock outcrops which severely limit timber harvesting operations. Harvesting operations, even with selling fuelwood or timber, would generally not be cost-effective throughout most of this area because of the limitations brought about by the rough terrain. Clearing operations like those taking place in the southern parcel are economically feasible only because the area must be cleared before the underlying rock can be mined. Fuelwood is really a by-product of the mining operation.

As industrial development of this property occurs, it is advisable to revegetate as soon as possible. Revegetation with sod and native tree and shrub species which will blend in with the natural environment will help in reducing runoff and erosion problems. Revegetation will also improve the aesthetic quality of the area, and allow for a somewhat natural visual barrier between buildings and parking lots.

Site preparation, including the addition of sufficient amounts of topsoil, fertilizer and lime, will be needed to satisfactorily establish a sod cover. The guidelines set forth for establishing vegetative cover in the "Erosion and Sediment Control Handbook for Connecticut" (U.S.D.A. Soil Conservation Service, Storrs, Ct., 1976) should be followed.

Utilization of the trees which are removed as the clearing operations are expanded is desirable. The mixed hardwood areas which are present at this time will provide between 14 and 20 cords of fuelwood per acre. Once again, removal of a wood product from many of these areas will not be feasible unless an operation such as that which is taking place on the southern parcel is begun. As a result, forest management of undevelopable land areas within these parcels will be at best limited.

VIII. PLANNING CONSIDERATIONS

A. Land Use

About 70 percent of the 340 acre tract of land is currently zoned for industrial uses. The remaining 30 percent is zoned for residential development with minimum lot sizes of 45,000 square feet per dwelling unit. Based on the Beacon Falls zoning regulations a wide variety of commercial, recreational and industrial uses could be developed on the 340 acre tract. The Beacon Falls' zoning regulations allow many diverse uses in industrial zones including: retail stores, business and professional offices, restaurants, hotels and motels, research laboratories, undertakers establishments, cleaning agencies, automobile service stations, business schools, warehousing, freight terminals, commercial storage, wholesale business, sale and distribution of fuel, lumber and building materials businesses, and manufacturing, processing or assembling of products. In addition, the zoning regulations allow sports stadiums, dog racing tracks and horse racing tracks by special exception in the industrial zone.

The Beacon Falls' zoning regulations can have a significant impact upon the type and quality of industrial development that takes place within the 340 acre tract. The use of "cumulative zoning" for the industrial districts in Beacon Falls provides for the opportunity of integrating a variety of commercial, industrial and warehousing operations within one industrial zone. The disadvantage of cumulative zoning is that, in certain cases, it may be preferable to develop specialized industrial parks exclusively catering to warehousing or industry due to the advantage of close proximity between similar industry groups. In addition, some industries seeking suburban industrial parks are seeking a more attractive and spacious setting away from commercial strip developments and other unaesthetic land uses which may emerge under zoning regulations like those for Beacon Falls.

In lieu of the distinct separation of the two portions of the 340 acre tract from the existing urban center of Beacon Falls, it may be advisable to establish industrial park regulations which prohibit the development of commercial and recreational land uses. In addition, serious consideration should be given to attracting industries which are compatible with the air, water and soil limitations associated with that portion of Beacon Falls.

The Town of Beacon Falls does not have a Plan of Development. However, the Central Naugatuck Valley Regional Planning Agency adopted a Regional Plan of Development in 1975 which identifies 175 acres in the 340 acre tract as suitable for industrial development. The balance of the tract has been identified as best suited for urban low densities of 2 to 4 dwelling units per acre (62 acres) and natural areas (104 acres) to be left undeveloped. In part, the land use plan of the Region was based on the limitations to industrial development prior to the reconstruction of Route 8. It also reflected some legitimate concerns for the protection of sensitive land areas such as steep slopes, shallow to bedrock areas and groundwater favorability zones. While there is still a need to protect sensitive land areas in Beacon Falls, there are also some economic development opportunities which have emerged with the realignment of Route 8, the removal of numerous residential structures and an increased amount of land made suitable for development created by mining operations located in the industrial zone.

The amount of land ultimately suitable for industrial development in the project area will depend upon the extent of mining and the provisions made for re-grading the area. It is projected that following the mining operation in the southern parcel, approximately 120 acres of land will be suitable for industrial development in this parcel. Presently, approximately 58 acres in the northern parcel are suitable for industrial development. With the implementation of a mining operation as is now occurring in the southern parcel, much more of this ± 129 acre tract could be made suitable.

The Conservation and Development Policies Plan prepared by the State of Connecticut Office of Policy and Management also provides some planning support for the proposed project. The Locational Guide Map in the Policies Plan identifies part of the 340 acre tract as an Urban Growth Area (the area north of Route 42) and the other part as a conservation area (the area south of Route 42). However, due to the scale at which the State Policies Plan Locational Guide Map was prepared it is not a precise guide for future urban growth. However, in broad terms, the Policies Plan supports the attraction of new urban growth near to the Route 8 reconstruction area since it is an area capable of supporting large scale, mixed uses and densities in close relationship to the existing urban areas of Beacon Falls.

In general the 340 acre tract of land is well protected from incompatible land uses such as residential development. However, by virtue of the fact that residential development preceded zoning, there are several areas bordering the tract which are in residential use. The portion of the tract north of Route 42 has two dwelling units bordering the property and the portion of the tract south of Route 42 has one dwelling unit nearby. None of these residential developments stands out as a serious land use conflict with the proposed industrial park.

B. Access

At present access to the 340 acre tract is provided off of Route 42 and Pent Road. Route 42 offers access to both the southern and northern tracts of land while Pent Road serves only the northern tract. Route 42 is a state highway with a direct connection to the new Route 8. In contrast, Pent Road is a town road with a more circuituous connection to Route 8 over Lopus Road, Railroad Avenue and Main Street. Due to the realignment of Route 8, access to the northern portion of the tract will be improved as a result of the realignment and widening of portions of Railroad Avenue. However, even with these modifications direct access to the northern portion of the tract over Railroad Avenue, Lopus Road and Pent Road would be inconvenient for heavy truck traffic due to the narrow width and poor alignment of Pent Road. At its narrowest point, Pent Road is only 18 feet wide with no shoulders and would not be able to carry more than 900 vehicles per hour at peak periods. In contrast, Route 42 is designed for a capacity of 1,540 vehicles per hour.

A second problem with the use of a northern access point to the 340 acre tract is that the bridge crossing over the railroad tracks has a maximum capacity of 7 tons. Without a new bridge at this location the northern access to the 340 acre tract would not be usable by trucks.

A third issue created by the development of an industrial park on a low volume rural road is the thickness of the pavement. Pavement designs for rural roads generally are not designed for a high volume of truck traffic. Consequently,

the pavement thickness may not be sufficient to support a large volume of heavy trucks over a long period of time.

In summary, the northern access route to the 340 acre tract is not adequate to serve an industrial park due to the narrow width of pavement, poor alignment and design of the road, insufficient weight capacity on the bridge, and insufficient pavement thickness to support a high volume of heavy truck traffic.

C. Highway Capacity

In order to determine if highway capacities of the existing circulation facilities are adequate to handle projected increases in vehicle travel it is necessary to make reasonable assumptions concerning (1) the amount of industrial development that will occur on the 340 acres, (2) the expected level of employment per acre of usable industrial land, and (3) typical trip generation intensity factors for industrial parks reflecting the total number of vehicle trips generated per employee. Based on planimeter calculations of potentially usable land within the 340 acre tract, the CNVRPA estimates that about 220 acres could ultimately be developed for industrial purposes. This estimate assumes 120 developable acres on the southern parcel and 100 developable acres on the northern parcel. In addition, it is assumed that the typical industry locating in the Industrial Park would generate 15 jobs per acre of usable land. This reflects recent trends toward more spacious low rise industrial developments found in most suburban industrial parks. Finally, based on trip generation intensity factors for industrial parks developed by the U.S. Department of Transportation it is expected that for each job created 3.3 vehicle trips will be generated. The formula below indicates the total vehicle trips per day that could be generated by the industrial park at its ultimate level of development.

Projected Vehicle Trips Generated by the
340 Acre Industrial Park at Ultimate Capacity

Potentially Usable Industrial Land		Employment Generated per Acre of Usable Land		Trip Generation Intensity Factor per Employee		Total Average Daily Traffic Level Generated
(220)	X	(15)	X	(3.3)	=	(10,890)

In 1978 Route 42 carried 2,500 vehicles per day between Rimmon Hill Road and Route 8. Based on the design characteristics of this portion of Route 42, the Connecticut Department of Transportation has determined that it has the capacity to carry 1,540 vehicle per hour. This results in a current vehicle to capacity ratio (V/C ratio) of .1579 which is considerably less than the threshold of .75 where serious traffic congestion and queuing problems become evident. However, if 10,890 vehicle trips are added to the 1978 average daily Traffic Count (ADT) of 2,500 and a reasonable increase in traffic levels is expected from future residential development (120 vehicle trips per day by 1990) then the total ADT for Route 42 could reach 13,510 at the ultimate development of the industrial park. This level of traffic would result in a V/C ratio of .88 which is well above the threshold for a critical congestion area.

The implication of this finding is that either 1) the extent of industrial development within the Park must be limited to prevent traffic congestion or 2) additional or improved access must be provided. Additional access to the Park

could be created by improving the Pent Road access to the north or constructing a through road to the south into the Town of Seymour. In addition to alleviating anticipated traffic congestion problems, the additional access points would alleviate the need for long cul-de-sacs within the industrial park parcels. It would appear that both parcels could now require cul-de-sacs of up to one mile in length. Long cul-de-sacs typically pose a fire safety problem and should be avoided if possible. Traffic congestion problems with development of the Park could also be mitigated by improving Rte. 42 in the project area.

The other alternative of limiting the extent of industrial development within the Park so as not to overload existing circulation facilities should also be considered. If development within the 340 acre park area were limited to 170 acres, then, given the above traffic generation assumptions, the average daily traffic count would drop to 8,415. This level of traffic would result in a V/C ratio of .72, which is below the .75 threshold for serious traffic congestion. What makes this alternative particularly attractive is the present condition of the landscape in the northern parcel. As previously discussed,only about 58 acres of this parcel are now considered suitable for industrial development. Considerable site preparation would be required to make the remaining areas suitable. In light of this, the Town may wish to restrict development in the northern parcel to land now suitable for development. This would allow most of the southern parcel to be developed as planned and would help ensure that traffic congestion does not become a problem. The wooded land not disturbed under this alternative would remain valuable from an aesthetic standpoint and could be incorporated in industrial land use design.

D. Economic Development Considerations

The development of the 340 acre tract should be consistent with the attraction of industries which have a locational advantage in the Waterbury Labor Market Area (WLMA). In 1979 the CNVRPA released a report called the Locational Advantage of the Waterbury Labor Market Area: 21 Industries with Growth Potential. The report identified 21 industries which have significant locational advantages in the WLMA and which could be expected to have minimal impact on the air and water quality of the Region. The attraction of these 21 industries would also have positive secondary impacts on the local economy of Beacon Falls. For example, it is generally known that a new firm creates new jobs and increases the tax base of the community. However, it is not generally recognized that some firms have a greater ability to increase employment in other local industries, stimulate increased retail sales and aid in the diversification of the economy.

The Table below identifies the 21 industry groups with economic growth potential in the proposed 340 acre industrial park.

Priority Ranking of Major Industries with Economic Growth Potential in the Waterbury Labor Market Area: 1979

Standard Industrial Classification	Industry	Rank
3479	Metal Coating and Allied Services	1
3841	Surgical and Medical Instruments	2
3843	Dental Equipment and Supplies	3
3842	Surgical Appliances and Supplies	4

Standard Industrial Classification	Industry	Rank
3549	Metalworking Machinery NEC*	5
3832	Optical Instruments and Lenses	6
3579	Office Machines, Typewriters, etc.	7
3678	Electronic Connectors	8
3573	Electronic Computing Equipment	9
3421	Cutlery	10
3674	Semi-Conductors and Related Devices	11
2752	Commercial Printing, Lithographic	12
2339	Women's and Misses' Outerwear NEC*	13
2844	Toilet Preparations	14
2024	Ice Cream and Frozen Deserts	15
2647	Sanitary Paper Products	16
3498	Fabricated Pipe and Fittings	17
3564	Blowers and Fans	18
3079	Miscellaneous Plastic Products	19
3563	Air and Gas Compressors	20
2649	Converted Paper Products	21

*NEC = not elsewhere classified

Source: CNVRPA Staff work, February 1979

E. Energy Considerations

The way the proposed industrial park is developed may influence the energy requirements of firms choosing to locate there. In particular, by developing streets through the park with east-west or north-south orientations it becomes easier to subdivide the land into lots with proper access to the sun. If the town of Beacon Falls should decide to establish a municipally owned industrial park it would be advisable to make it an energy efficient development. This could be done by encouraging, if not requiring, industrial buildings to have their long axis facing to the south in order to take advantage of the solar energy gained from passive solar design concepts. Proper orientation and siting of buildings in relationship to the sun and the wind are no longer issues of peripheral interest in industrial park development schemes. Energy costs are rising and are often cited as one additional reason why Connecticut is a disadvantageous place to locate a new firm. This way of thinking can be largely revised if the town of Beacon Falls develops an industrial park which optimizes the use of renewable resources. As an example, solar energy systems for space heating and domestic hot water could be provided like other utilities such as sewer or water service as a basic ingredient of the proposed industrial park. Such a proposal would not only be innovative but would attract a great deal of firms interested in reducing their energy costs.

F. Conclusion

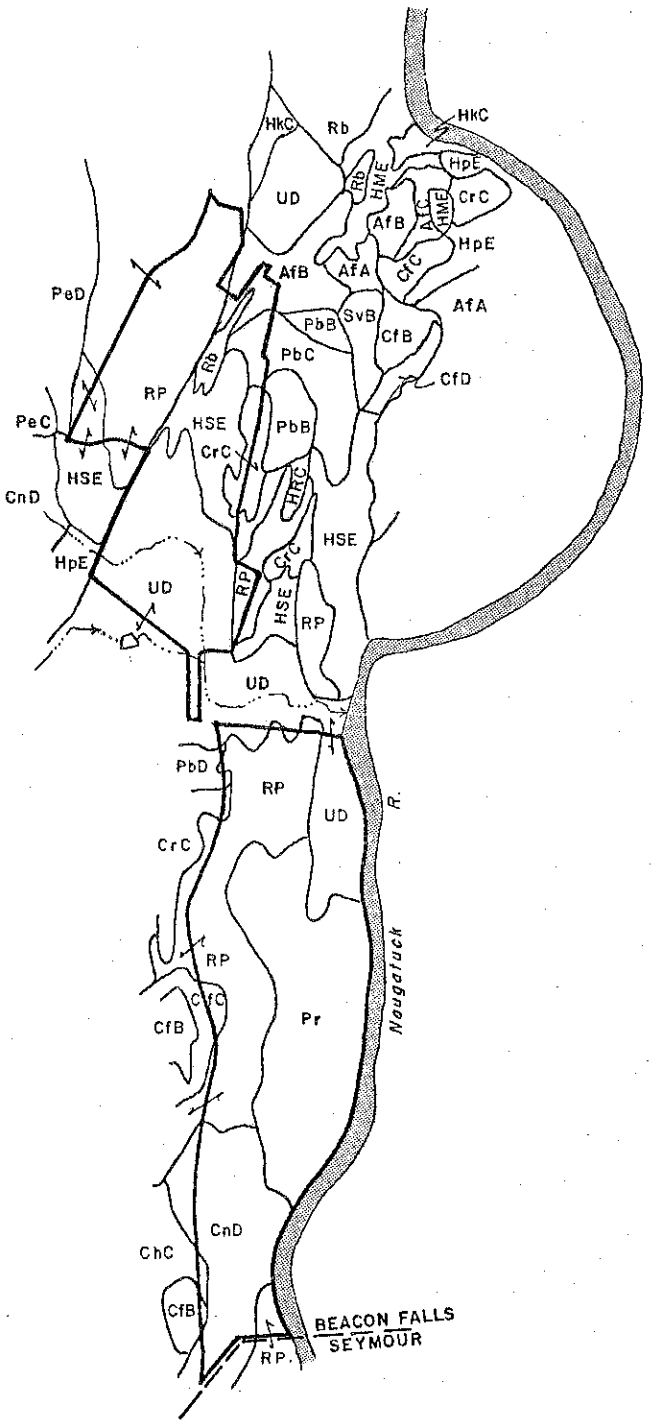
In summary, the 340 acre tract is an ideal location for an industrial park since it has excellent access to Route 8, a plentiful supply of usable land (at least 178 acres), an adequate water supply, nearby sewer service and little, if any, incompatible development nearby.

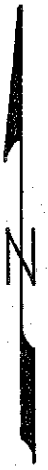
Nonetheless, there are some constraints to development at this site including limited highway capacities, limited capabilities for process water discharges into Hemp Swamp Brook, possible zoning problems created through a cummulative zoning approach for the park,and the lack of a comprehensive Plan of Development for guiding the economic development activities of the Town of Beacon Falls. The Town should attempt to address these constraints before embarking on a comprehensive industrial park development plan.

* * * * *

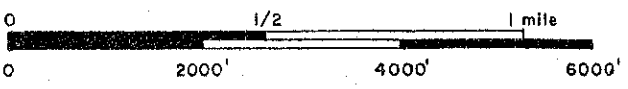
APPENDIX

SOILS MAP





SCALE: 1" = 2000'



SOILS LIMITATION CHART

"POTENTIAL INDUSTRIAL PARK AREAS" - BEACON FALLS, CT.

MAP SYMBOL	SOIL NAME	SEPTIC ABSORBTION FIELDS		COMMERCIAL BUILDINGS		ROADS & STREETS		LANDSCAPING	
		RATING	REASON	RATING	REASON	RATING	REASON	RATING	REASON
AfA	Agawam fine sandy loam, 0-3% slopes	Slight		Slight		Slight		Slight	
AfB	Agawam fine sandy loam, 3-8% slopes	Slight		Moderate	Slope	Slight		Slight	
AfC	Agawam fine sandy loam, 8-15% slopes	Moderate	Slope	Severe	Slope	Moderate	Slope	Moderate	Slope
CfB	Charlton fine sandy loam, 3-8% slopes	Slight		Moderate	Slope	Slight		Slight	
CfC	Charlton fine sandy loam, 8-15% slopes	Moderate	Slope	Severe	Slope	Moderate	Slope	Moderate	Slope
CfD	Charlton fine sandy loam, 15-25% slopes	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope
ChC	Charlton very stony fine sandy loam, 8-15% slopes	Moderate	Large stones, Slope	Severe	Slope	Moderate	Slope	Moderate	Large stones, Slope
CnD	Charlton extremely stony fine sandy loam, 15-35% slopes	Severe	Large stones, Slope	Severe	Slope, Large stones	Severe	Slope	Severe	Slope, Large stones
CrC	Charlton-Hollis fine sandy loams, 3-15% slopes Charlton part	Severe	Large stones	Severe	Slope, Large stones	Moderate	Large stones	Severe	Large stones
	Hollis part	Severe	Depth to rock, Large stones	Severe	Slope, Depth to rock, Large stones	Severe	Depth to rock	Severe	Depth to rock, Large stones

SOILS LIMITATION CHART

"POTENTIAL INDUSTRIAL PARK AREAS" - BEACON FALLS, CT.

MAP SYMBOL	SOIL NAME	SEPTIC ABSORBTION FIELDS RATING	SEPTIC ABSORBTION FIELDS REASON	COMMERCIAL BUILDINGS RATING	COMMERCIAL BUILDINGS REASON	ROADS & STREETS RATING	ROADS & STREETS REASON	LANDSCAPING RATING	LANDSCAPING REASON
HkC	Hinckley gravelly sandy loam, 8-15% slopes	Moderate	Slope	Severe	Slope	Moderate	Slope	Severe	Small stones, Droughty
HME	Hinckley and Manchester soils, 15-35% slopes Hinckley part	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope, Small stones, Droughty
	Manchester part	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope, Small stones, Droughty
HpE	Hollis-Charlton fine sandy loams, 15-35% slopes Hollis part	Severe	Slope, Depth to rock, Large stones	Severe	Slope, Depth to rock, Large stones	Severe	Depth to rock	Severe	Slope, Depth to rock, Large stones
	Charlton part	Severe	Large stones, Slope	Severe	Slope, Large stones	Severe	Slope	Severe	Slope, Large stones
HrC	Hollis-Rock Outcrop Complex, 3-15% slopes	Severe	Depth to rock, Large stones	Severe	Slope, Depth to rock, Large stones	Severe	Depth to rock	Severe	Depth to rock, Large stones
HSE	Hollis-Rock Outcrop Complex, 15-35% slopes	Severe	Slope, Depth to rock, Large stones	Severe	Slope, Depth to rock, Large stones	Severe	Depth to rock	Severe	Depth to rock, Large stones

SOILS LIMITATION CHART

"POTENTIAL INDUSTRIAL PARK AREAS" - BEACON FALLS, CT.

MAP SYMBOL	SOIL NAME	SEPTIC ABSORBTION FIELDS RATING	SEPTIC ABSORBTION FIELDS REASON	COMMERCIAL BUILDINGS RATING	COMMERCIAL BUILDINGS REASON	ROADS & STREETS RATING	ROADS & STREETS REASON	LANDSCAPING RATING	LANDSCAPING REASON
PbB	Paxton fine sandy loam, 3-8% slopes	Severe	Percs slowly	Moderate	Frost action, Slope	Moderate	Frost action	Slight	
PbC	Paxton fine sandy loam, 8-15% slopes	Severe	Percs slowly	Severe	Slope	Moderate	Frost action, Slope	Moderate	Slope
PbD	Paxton fine sandy loam, 15-25% slopes	Severe	Slope, Percs slowly	Severe	Slope	Severe	Slope	Severe	Slope
Pr	Pits, gravel	---- S O I L C H A R A C T E R I S T I C S V A R I A B L E ----							
Rb	Raypol silt loam	Severe	Wetness	Severe	Wetness, Frost action	Severe	Wetness, Frost action	Severe	Wetness
RP	Rock Outcrop-Hollis Complex	Severe	Slope, Depth to rock, Large stones	Severe	Slope, Depth to rock, Large stones	Severe	Slope, Depth to rock	Severe	Slope, Depth to rock, Large stones
SvB	Sutton fine sandy loam,	Severe	Wetness	Moderate	Slope, Wetness	Moderate	Frost action	Slight	
UD	Udorthents, smoothed	---- S O I L C H A R A C T E R I S T I C S V A R I A B L E ----							

EXPLANATION OF RATING SYSTEM

1. SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.
2. MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.
3. SEVERE LIMITATION: indicates that the use of the soil is seriously limited by hazards or restrictions that require extensive and costly measures to overcome.

NOTE: Limitation Ratings Based Upon U.S.D.A. Soil Conservation Service Criteria.

ABOUT THE TEAM

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state, and regional agencies. Specialists on the team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, recreation specialists, engineers, and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - a 47 town area in western Connecticut.

As a public service activity, the team is available to serve towns and developers within the King's Mark Area --- free of charge.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in the review of a wide range of significant activities including subdivisions, sanitary landfills, commercial and industrical developments, and recreation/open space projects.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental Reviews may be requested by the chief elected official of a municipality or the chairman of an administration agency such as planning and zoning, conservation, or inland wetlands. Requests for reviews should be directed to the Chairman of your local Soil and Water Conservation District. This request letter must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer allowing the team to enter the property for purposes of review, and a statement identifying the specific areas of concern the team should address. When this request is approved by the local Soil and Water Conservation District and the King's Mark RC&D Executive Committee, the team will undertake the review. At present, the ERT can undertake two reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil Conservation District Office or Richard Lynn (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P.O. Box 30, Warren, Connecticut 06754.