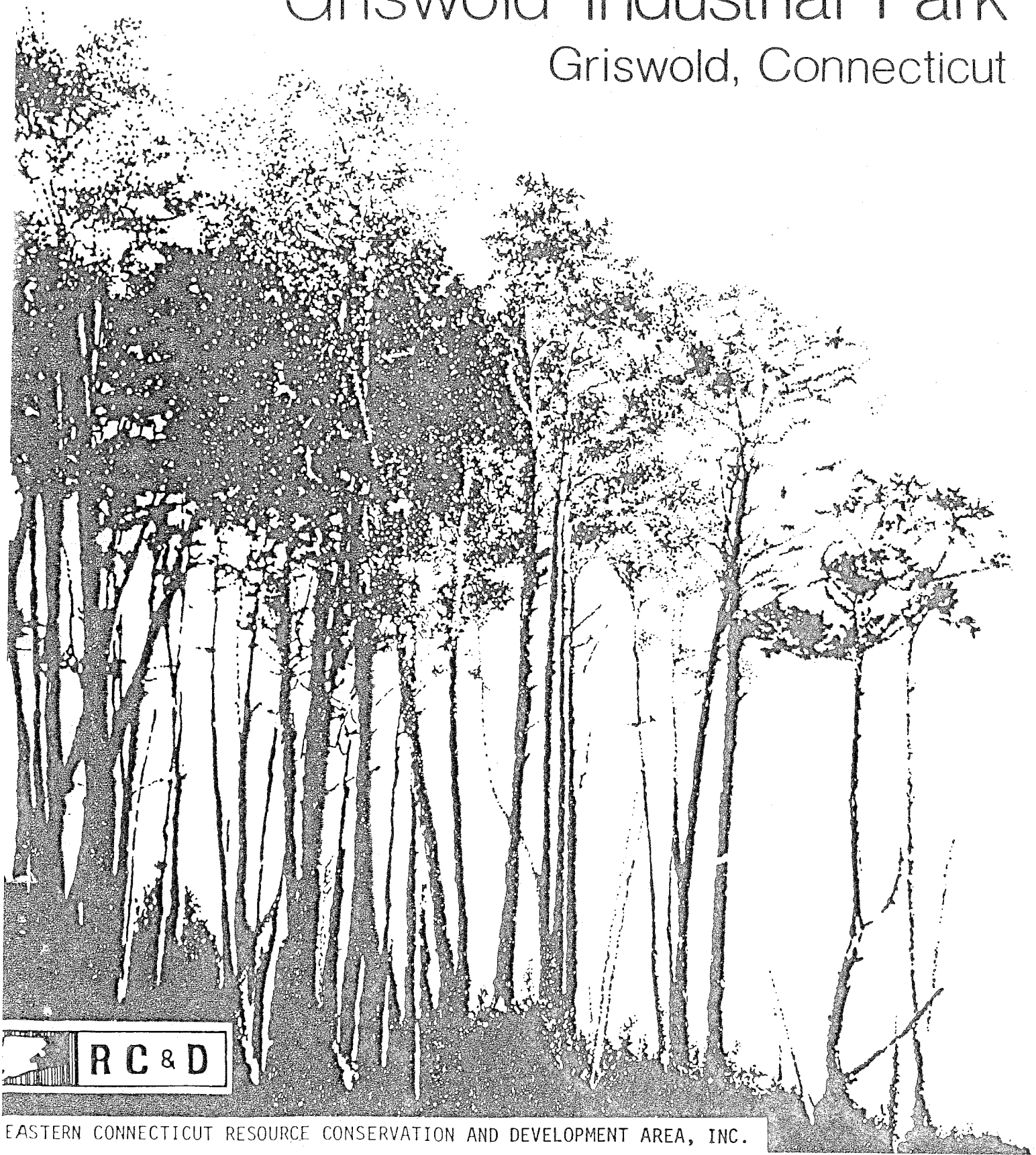
Environmental Review Team Report

Griswold Industrial Park

Griswold, Connecticut



R C & D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

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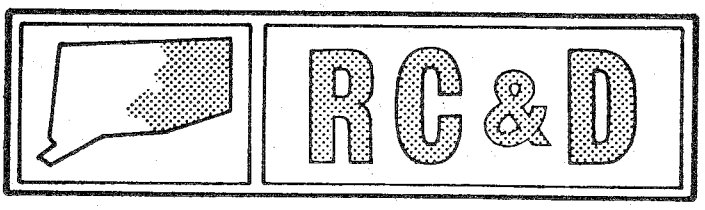
December 1983

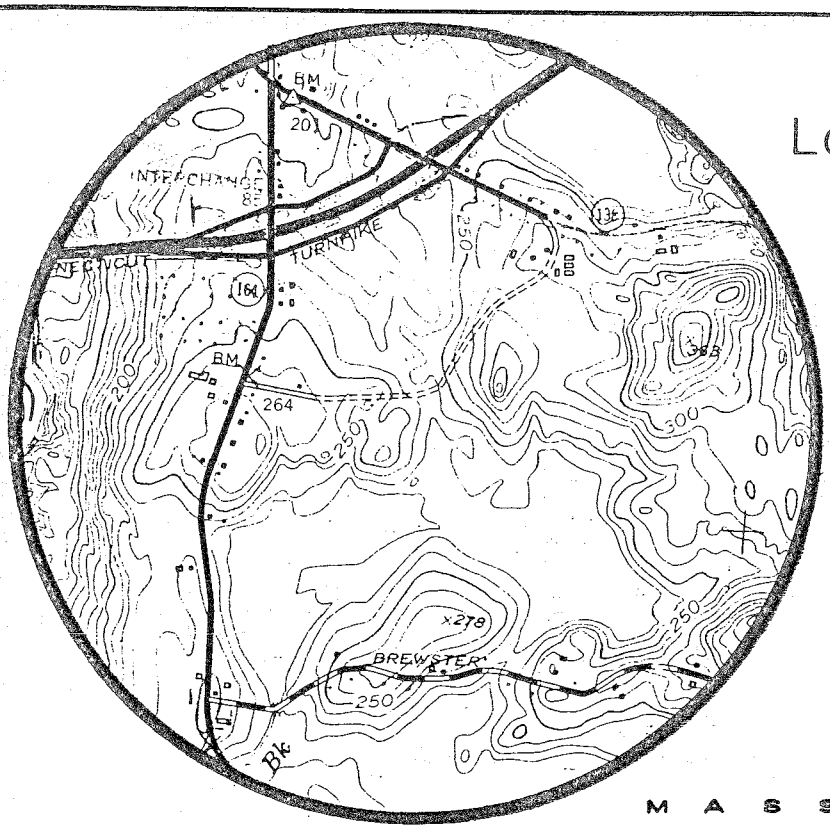


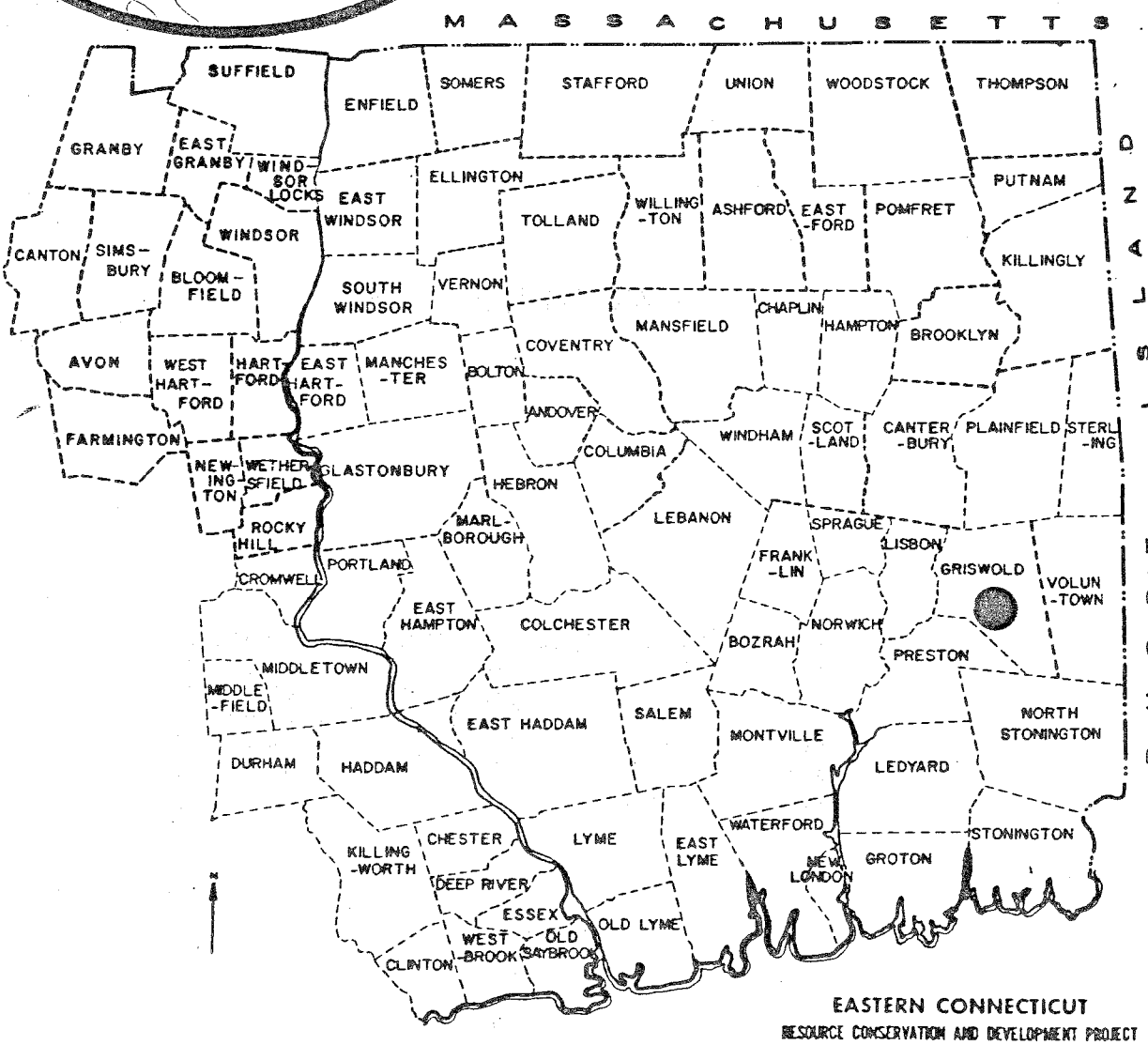
Eastern Connecticut Resource Conservation & Development Area

Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234

Location of Study Site

GRISWOLD INDUSTRIAL PARK
GRISWOLD, CONNECTICUT





ENVIRONMENTAL REVIEW TEAM REPORT
ON
INDUSTRIAL PARK
GRISWOLD, CONNECTICUT

This report is an outgrowth of a request from the Griswold Economic Development Commission 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) Area Executive Committee for their consideration and approval as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

The ERT that field checked the site consisted of the following personnel: Mike Schaefer, Soil Conservationist, Soil Conservation Service (SCS); Al Roberts, Soil Specialist, SCS; Bill Warzecha, Geologist, Department of Environmental Protection (DEP); Pete Merrill, Forester, DEP; Charles Storrow, Regional Planner, Southeastern Connecticut Regional Planning Agency; Don Capellaro, Sanitarian, State Department of Health; David Cherico, Sanitary Engineer, DEP; John Rook, Wildlife Biologist, DEP; Judy Wilson, Wildlife Biologist, DEP; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

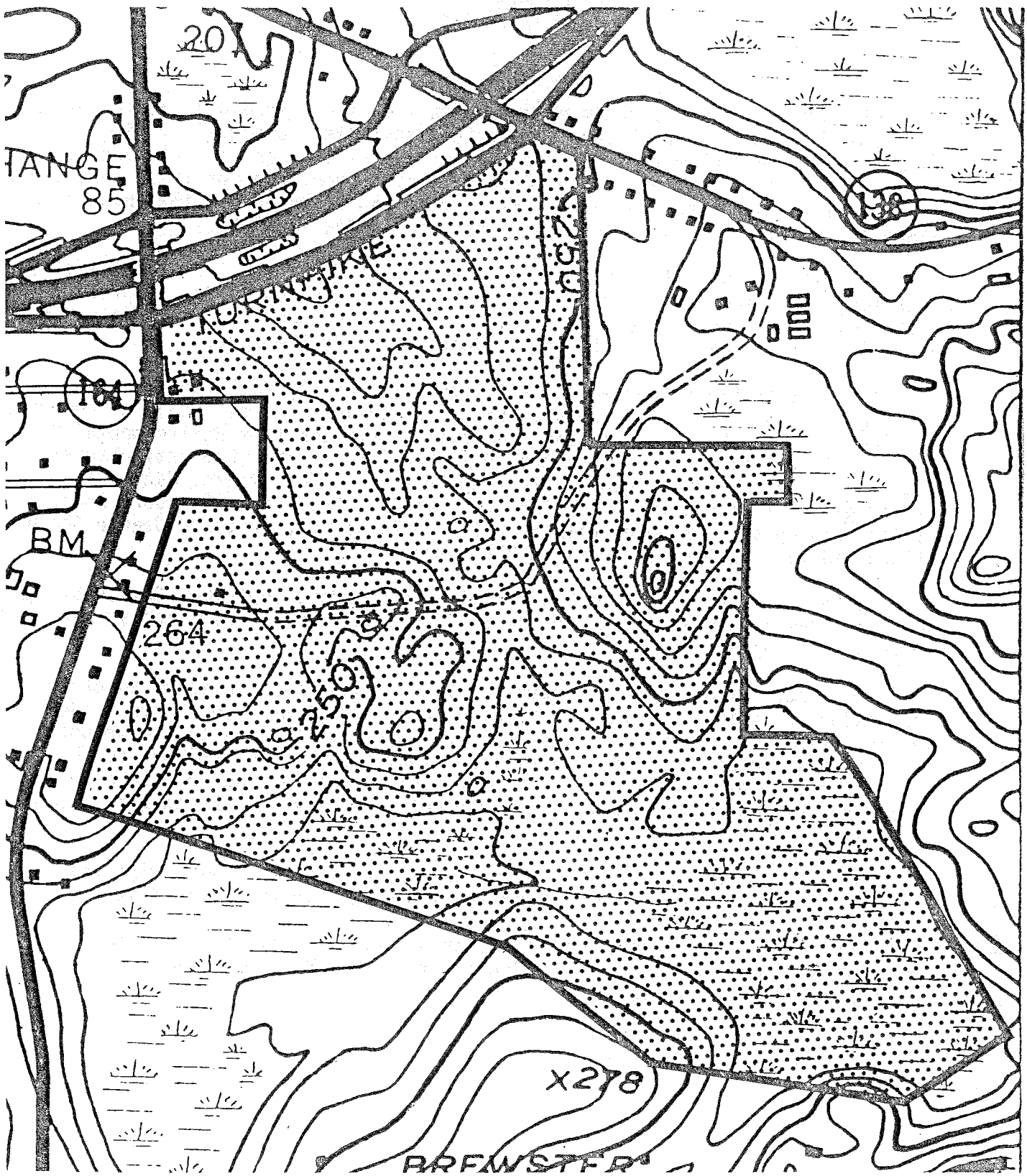
The Team met and field checked the site on Tuesday, September 20, 1983. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

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

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

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, P.O. Box 198, Brooklyn, Connecticut 06234, 774-1253.

Topography	Site Boundary	0 660' scale	N



INTRODUCTION

The Economic Development Commission of the Town of Griswold is seeking to establish an industrial park in the Town. The Eastern Connecticut Environmental Review Team was asked to provide an environmental assessment of the preferred site for industrial development. The site is located on the south side of Interstate 395 (formerly Route 52) between Route 164 and Route 138. The site is approximately 200± acres in size and is in the private ownership of three separate parties. It is contemplated at this time that the land would be purchased by the Town with Federal and State funding aid, a plan would be made for its development and parcels would be sold to industrial firms which would build their own facilities. Presumably, the Griswold Development Commission would manage the project, or it might be decided to set up a non-profit corporation similar to the Norwich Community Development Corporation which manages the Norwich Industrial Park.

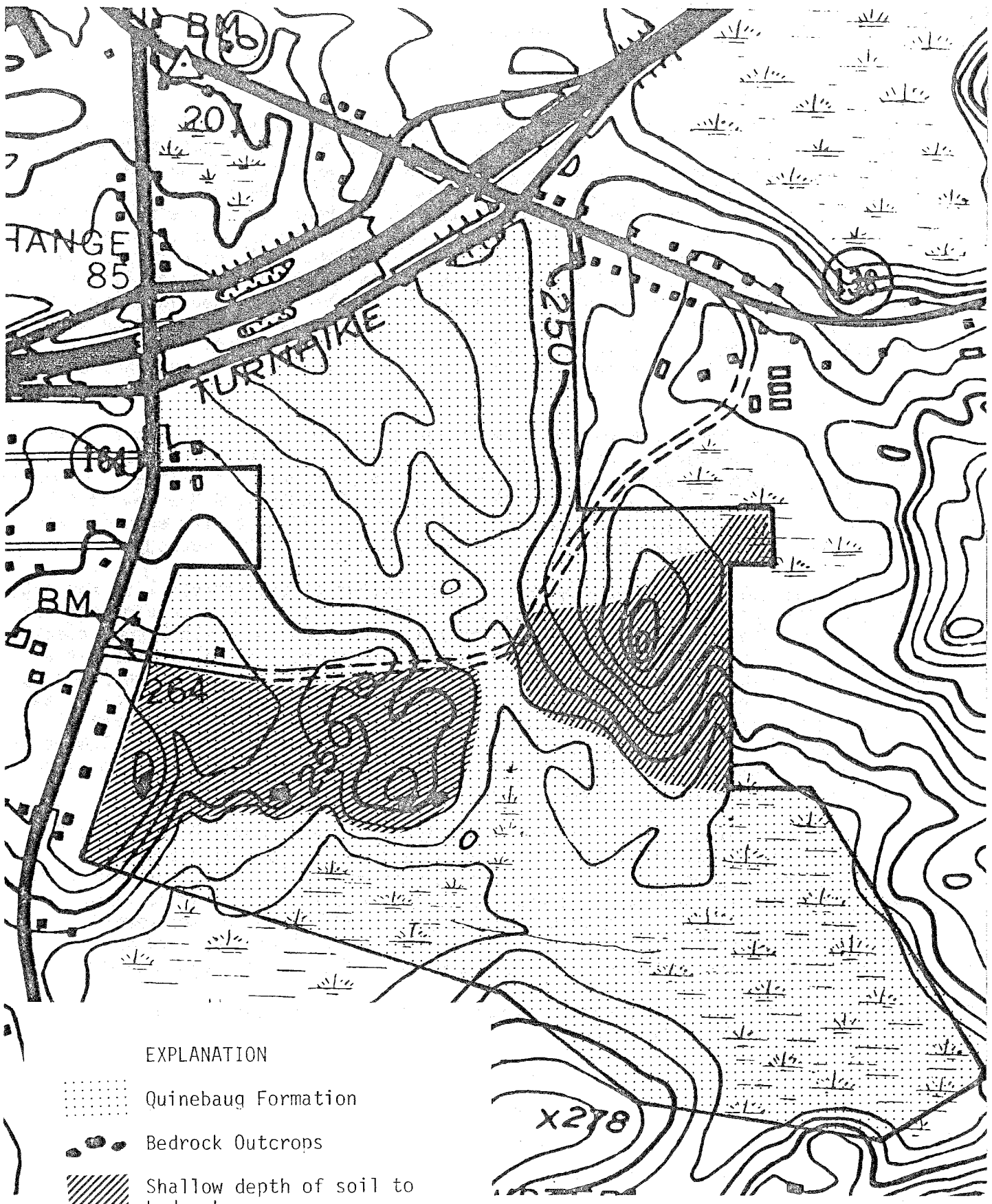
The park would be limited to light industrial uses similar to those in the Norwich Industrial Park. Examples are: computer facilities, manufacture of electronic equipment, warehousing and wholesale distribution facilities. It would seem that an industrial park of this kind could well contribute towards fulfillment of an important regional need, that of diversification of the economic base of the area through expansion of the non-defense sector of the economy.

The Team is primarily concerned with the effect of this proposal on the natural resource base of this site. Although many severe limitations to development can be overcome with proper engineering techniques, these measures can become costly, making a project financially unfeasible for a developer. The study site has a number of limitations which must be taken into consideration during the planning stages of this project. These limitations include the large wetland area in the southeast section of the site, existence of prime agricultural soils, lack of utilities (public water, sewer and electrical service) to the site, shallow depth of soils to bedrock, bedrock outcrops, seasonal high water tables, and possible downstream flooding from stormwater run-off increases.

These limitations were discussed briefly with the Economic Development Commission's engineer at the time of the field review. Mitigating measures were also proposed. These would include avoidance of wetland areas in developing the parcel and extension of existing water and sewer mains. Use of prime agricultural soils for industrial development may place limitations on the amount of federal funding participation for this project. It is suggested that the Economic Development Commission explore these possible funding problems more fully.

A more detailed discussion of Team members' concerns can be found in the following sections of this report.

Bedrock Geology



ENVIRONMENTAL ASSESSMENT

TOPOGRAPHY

The irregularly shaped 200± acre site is located in east central Griswold lying between Routes 164 and 138. Interstate 395 (Frontage Road) borders the northern limits of the site. The topography of the site as shown by the accompanying topographic map can be divided into three sections. Section 'A', which comprises the southern portion of the parcel, is occupied primarily by wetlands. A small section along the southern boundary rises in elevation from the wetlands to two small bedrock-controlled hills on which Brewster Road traverses. Section 'B' includes the central portion of the parcel. This section is characterized by small bedrock and/or till controlled hills where surficial deposits (material overlying bedrock) are generally thin. Section 'C' includes the northern portions of the parcel. Land surface in this section slopes gently towards an intermittent stream in the central portions, which include wetlands. Based on visual inspection and aerial photographs, some of this wetland area has been modified by man in the past.

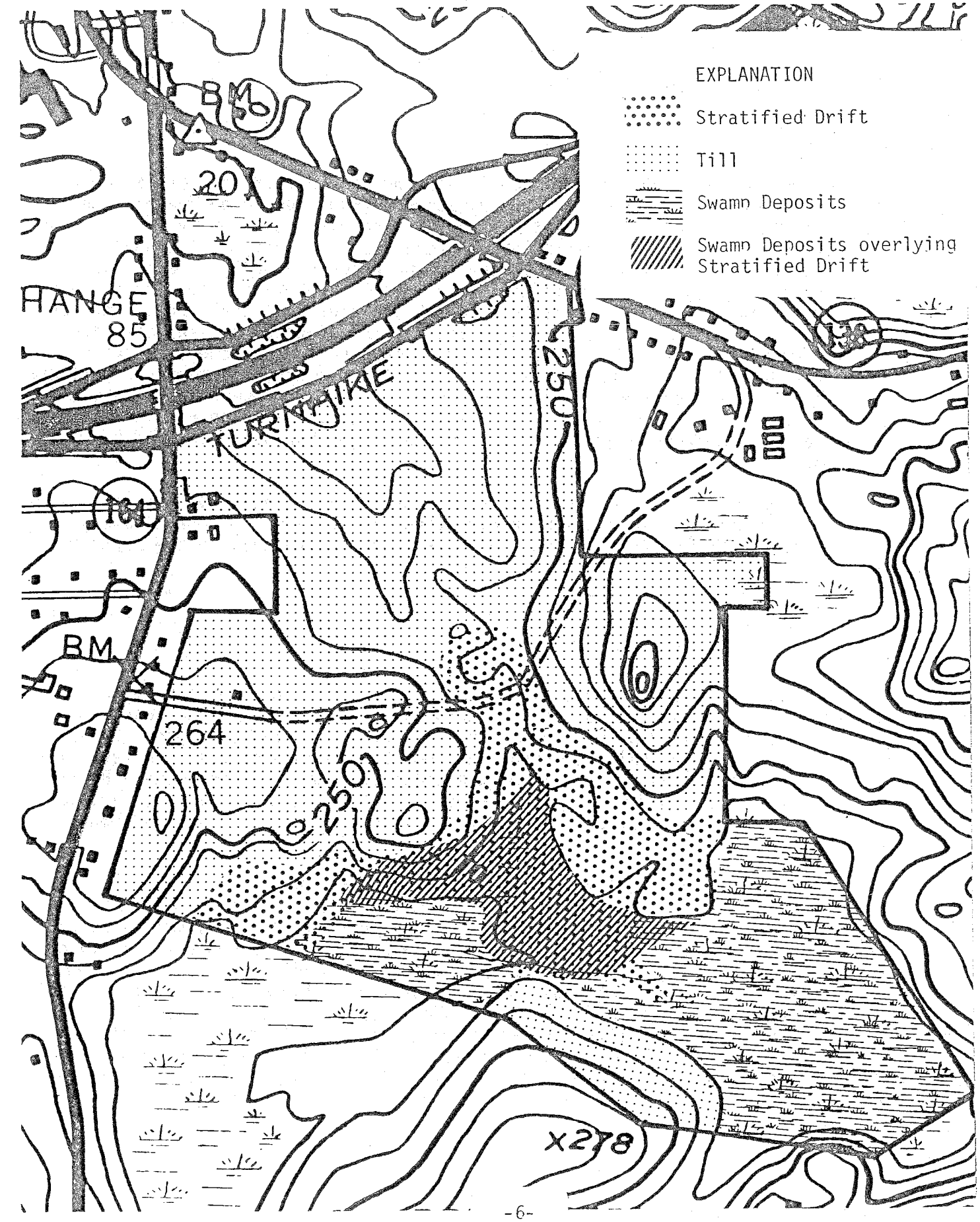
Elevation of the site ranges from approximately 220 feet above mean sea level throughout the wetlands in the southern section of the site, to approximately 310 feet above mean sea level at the top of a stream-lined hill in the northeast section.

GEOLOGY

The proposed Griswold industrial park is located in the Jewett City Topographical quadrangle. A surficial geologic map (GQ-1434) of the quadrangle has been prepared by Byron D. Stone and published by the U.S. Geological Survey. The bedrock geology for this quadrangle has not been mapped to date. Nevertheless, pertinent bedrock geologic information was obtained from the "Preliminary Bedrock Geological Map of Connecticut" by John Rodgers (1962). An accompanying map, as adapted from these publications, shows the distribution of surficial and bedrock deposits on the site.

Bedrock is exposed in the east/central portion of the property. The major type of bedrock that underlies or crops out on the parcel is the "Quinebaug Formation." The Quinebaug Formation is a well-layered, medium grained, dark gray, commonly greenish gneiss composed of the minerals hornblende, andesine, biotite and epidote interlayered with amphibolite. 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 hornblende and biotite. Large, blocky masses of feldspar or quartz crystals distort the lineation in many places. The banding is produced by the alteration of these dark (biotite and hornblende) and light (quartz and feldspar) minerals. The normally sized feldspar and quartz grains impart a granular

Surficial Geology



texture to the rock. Amphibolites are rocks consisting mainly of the minerals amphibole and plagioclase. Quartz is usually absent or present in small amounts in the rock. As the amount of quartz increases, there is a gradation to hornblende-plagioclase gneiss.

With the exception of a few isolated rock outcrops in section 'B' of the site, bedrock throughout most of the site is covered by unconsolidated glacial sediments and by swamp deposits. The two major types of glacial sediments present on the site include till and stratified drift. Till was deposited directly from glacial ice while stratified drift was deposited by meltwater streams emanating from the ice. Till and stratified drift have conspicuously different textures as a result of their respective modes of origin. Till is generally non-sorted, containing a mixture of rock fragments ranging from clay to boulders. It is commonly sandy, stony and relatively loose in the upper few feet, however, it becomes siltier and very compact at depth. Stratified drift, however, is commonly characterized by grain size sorting and layering which resulted from significant reworking of the sediments by meltwater streams. Gravel and sand are the major components of stratified drift.

The till soils are found primarily throughout the northern half of the site and along the southern boundary. They are designated on the soils map as Woodbridge, Paxton, Sutton, Charlton, Canton, Sudbury and Hollis soils. The Hollis series are usually indicative of shallow to bedrock soils (less than 20" to bedrock) and are generally stony. Although the thickness of till is unknown, it probably ranges from zero where outcrops occur to less than 10 feet thick throughout the remainder of the site.

The stratified drift deposits are found primarily in the central portions of the site and are shown as the Merrimac series on the soils map. The thickness of the stratified drift is not known but it probably does not exceed ten feet in most places.

Swamp deposits are found primarily in the southern portions of the site. These deposits consist mostly of peat and muck with minor amounts of silt, sand and clay that formed in stagnant or sluggish moving water. Thickness of the swamp deposits on the site range from approximately two feet to perhaps more than five feet and are underlain mainly by stratified drift. Because standing water is present for most of the year in wetlands, these areas are inappropriate for any type of standard development.

From a geological perspective, it appears that the most limiting factors with respect to developing the site as an industrial park, include (1) the shallow depth to bedrock conditions and rock outcrops in the central sections of the parcel, (2) wetland areas and (3) the stoniness of many till soils, which may also be prone to seasonally high groundwater tables. However, these limitations would be minimized substantially if sanitary sewers are extended to service. Also, if the parcel is sewered, it should effectively eliminate the risk of substantial groundwater contamination.

If extension of a public sewer is not possible to the site, it appears that a large portion of the parcel would not be ideally suited for major waste water discharge. Discharges from small or moderately sized septic systems would

Drainage Areas

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SCALE

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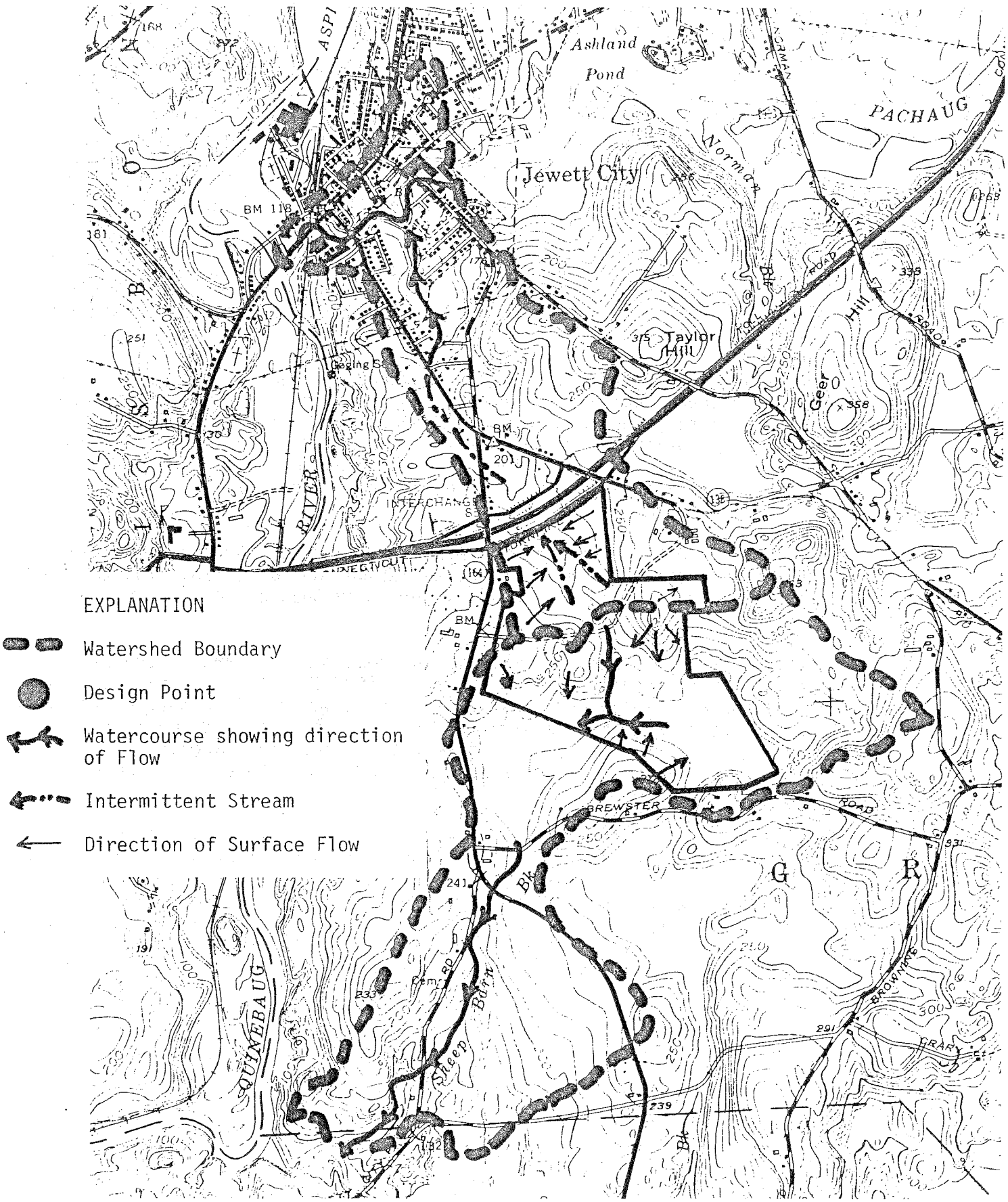


EXPLANATION

- Watershed Boundary
- Design Point
- Watercourse showing direction of Flow
- Intermittent Stream
- Direction of Surface Flow

probably be acceptable on some of the elevated farmlands in the northern half of the parcel. This is assuming the systems were properly designed and installed in strict compliance with the public health code. However, the remainder of land would probably be poorly suited due to the presence of rock outcrops, shallow bedrock conditions, and till soils.

HYDROLOGY

The proposed municipal industrial site lies within two separate watersheds which divide the parcel nearly in half. The dividing line tends to follow along the crests of the hills in the central portions of the site. (See Drainage Area Map)

Surface water and groundwater throughout the northern half of the site tends to drain towards the low-lying wet area in the central portions of this section. This wet area is drained by an intermittent stream, which flows in an northward direction. It ultimately empties into a more well-defined stream northeast of Griswold High School. This stream, which is unnamed, is a tributary to Pachaug River. This watershed drains an area of .7 square miles or 462 acreas.

Surface water and groundwater in the southern half of the site drains into the wetlands occupying this portion of the parcel. This wetlands area lies in the upper parts of the watershed and forms the headwaters of Sheep Barn Brook. The brook, which doesn't become well-defined until it passes under Brewster Road, south of the site, flows in a south to southwest direction through the watershed. Sheep Barn Brook is a tributary to the Quinebaug River. This watershed drains an area of 1.1 square miles or 726 acres.

It should be noted that no site plan or layout was made available to Team members to allow the determination of the runoff change likely to occur from land use modification. Nevertheless, development of the site can be expected to lead to increases in stormwater runoff. The amount of increased runoff will depend largely on the density of the proposed industrial park, extent of development, amount of vegetation removed, the amount of impervious surfaces, i.e., roof tops and paved areas created and the timing of development on each lot. Since an industrial park use would tend to require more impervious surface area, i.e., larger parking areas and bigger buildings, the runoff increase for that type of development would tend to be higher than, for example, residential development. Increased amounts of runoff resulting from development could cause flooding problems to homesites down stream of the parcel. Therefore, it is highly recommended that a detailed engineering study of the pre- and post-development runoff from the entire site, as well as a careful stormwater management plan be prepared for this area prior to any development. In this regard, consideration should be given to utilizing existing ponds in the northern portions of the site and/or wetlands in the southern portion as stormwater retention basins.

As previously mentioned, much of the southern portions of property, as well as a portion of the northern sections of the parcel are occupied by wetlands. Wetlands do serve many hydrological and ecological functions which include: (1) acting as a natural retention basin reducing downstream flood flows during

periods of heavy precipitation, (2) trapping sediments from upstream areas, (3) changing water quality through biochemical processes which often results in cleaner water, and (4) providing habitat for many species of animals and plants from an ecological standpoint. For these and other reasons, wetland filling or modification should be avoided where possible. Therefore, if wetlands are proposed to be modified, it is recommended that the developer(s) first submit a detailed analysis of the potential effects of the modification, together with a detailed plan of the proposed project for review by appropriate town officials and commissions (i.e., Inland-Wetlands Commission, Conservation Commission, etc.).

SOILS

A detailed soils map of this site is included in the Appendix of this report, accompanied by a chart which indicates soil limitations for various urban uses. The soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types of the site. The soil limitation chart indicates the probable limitations for each of the soils for on site sewage disposal, buildings with basements, streets and parking, and landscaping. However, limitations even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistant with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication Soil Survey of New London County Connecticut can aid in the identification and interpretation of soils and their uses on this site. Know Your Land: Natural Soil Groups For Connecticut can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

The soils on the site are predominantly of glacial till origin. They are loamy textured soils that range from excessively drained to very poorly drained. The slopes are mostly smooth and gentle and range predominantly from 2 to 8 percent. Several areas have slopes up to 12 percent and stony to very stony surfaces. The soils of glacial outwash origin are sandy and gravelly. They are located near and around Sheep Barn Brook. These sandy and gravelly soils range from somewhat excessively drained to poorly drained and have slopes that are nearly level to level. The wetland soils are mostly wooded and have streams or drainageways running throughout. The large wetland areas within the southern portion of the property consist of very poorly drained soils that formed in herbaceous organic deposits greater than 16" thick. Adrian and Palms (Aa) soils have organic layers 16 to 51 inches thick. Carlisle (Ce) soils have organic layers greater than 51 inches thick.

A considerable amount of filling was done in the northern portion of this parcel. Some areas of poorly and very poorly drained soils were filled and a road constructed through them. Wetland soil boundaries should be verified in the field and incorporated into site plans.

The western portion of the site is comprised primarily of moderately well-drained soils of the Woodbridge series. Slopes range from 3 to 8 percent. Seasonal wetness due to a slowly permeable substratum is the major limitation for development.

An old cemetery is located near the center of the property in the soil area mapped as MyB, Merrimac sandy loam. There are numerous grave sites and headstones dating back to the late 1600s and early 1700s. This may be an area of interest to local historians.

Much of the area lends itself to the type of development under proposal with only slight to moderate limitations. Most of the soils where development is least limited are also prime farmland soils.

A considerable portion of the property is mapped as inland wetland. Care should be taken when developing site plans to minimize encroachment on or sedimentation of these areas. Natural drainage features should not be obstructed.

Prime Farmland Soils

More than half of this property is comprised of prime farmland and additional farmland of statewide importance. Prime farmland as defined by USDA, is that land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops, and is also available for these uses. The land could be cropland, pastureland, forestland or other land but not urban built up land or water.

In Connecticut, among other criteria, slopes on prime farmland range from 0 to 8 percent. Less than 10 percent of the surface layer (upper 6 inches) consists of rock fragments coarser than 3 inches.

Sediment and Erosion Control

Plans for sediment and erosion control should be incorporated into the site development plan. There is a relatively high potential on this site for sediment to reach wetlands or watercourses. Temporary and permanent measures should be used and planned in a site specific manner. Especially susceptible to erosion are soils on steep slopes which are disturbed and left unprotected.

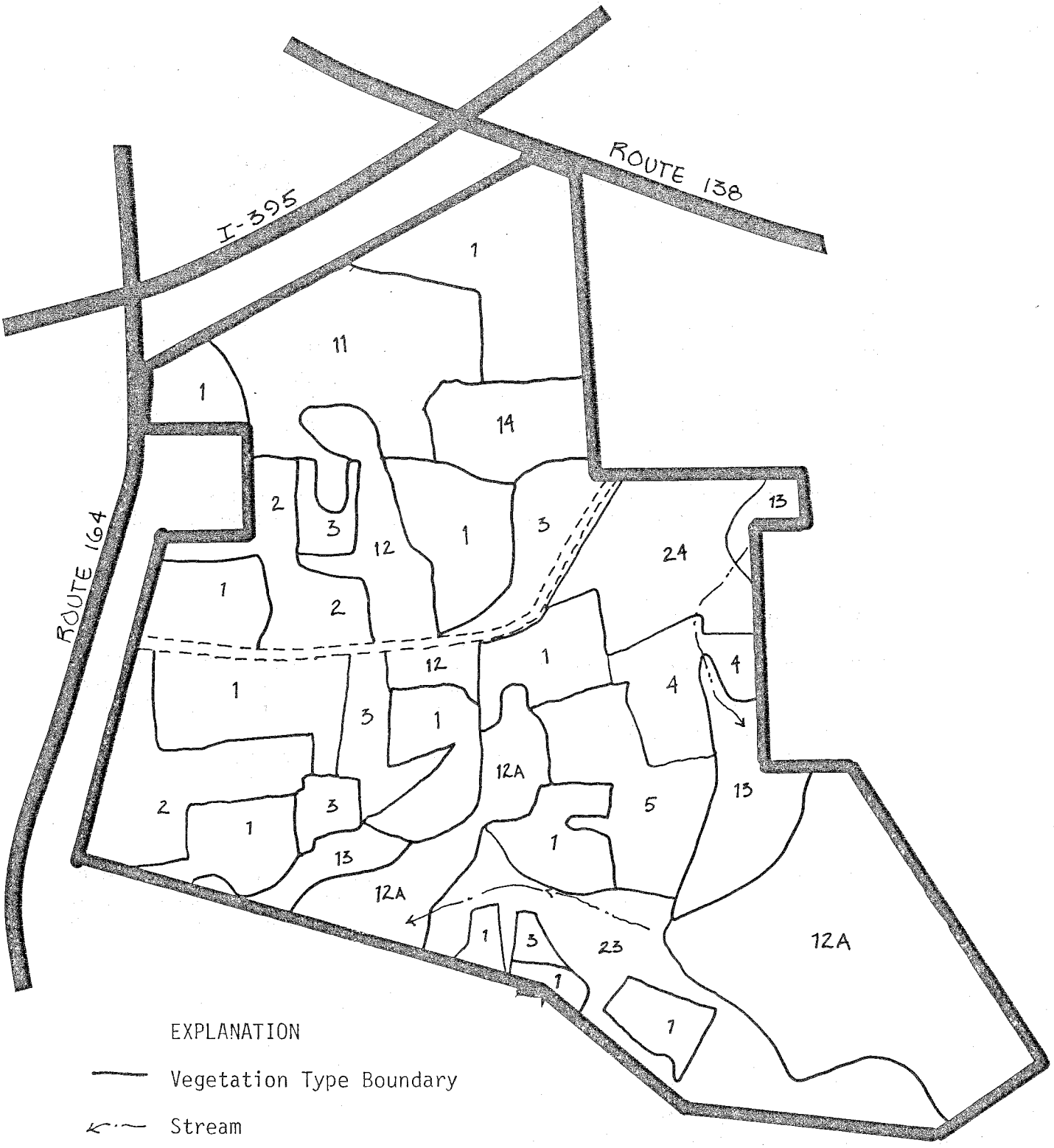
Stormwater Management

The site lends itself to stormwater detention through the use of land grading, vegetation and/or detention ponds. Through proper planning and implementation, stormwater should leave the site with no significant increase in peak discharge.

VEGETATION

Most of this site is either active farmland or old farmland reverting back to a climax forest type. The main drainage areas are predominantly red maple with the size class dependent on the time since abandonment of the fields. Although there are no areas of open swamp, typified by grass hummocks and light brush, areas in the southern and southeastern portion of the proposed area do

Vegetation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EXPLANATION
Vegetation Type Boundary
Stream
Unpaved Road
Property Boundary

have impeded drainage and in places the tree growth is restricted to hummocks with seasonal standing water.

There is one major access road which is the old farm road running from Rte. 164 in a general easterly direction. There are also a series of small access roads running off this to the various fields.

On the vegetation map the different areas of the land are numbered. Numbers 1 through 4 indicate field types. The listed woody species may or may not be present in all the sites, but will be found in most of the area of the same age.

Area #1 is open cropland cultivated now or within the last two years. It contains only annual weeds and grasses with some biennial weeds, perennial grasses and occasional woody seedlings, usually red maple. Area #2 is cropland abandoned two to four years. Besides the annual grass and weeds, there are now many perennial grasses and weeds. Woody plants have started to invade; these include: red maple and black cherry for trees, Arrow-wood, gray and silky dogwoods, bayberry and juniper.

Area #3 is cropland abandoned five to fifteen years. Perennial grasses and weeds persist but trees are reaching two to four inches in diameter. Tree species include: red maple, black birch, hickories (both pignut and shagbark), apple, pear, black cherry, red cedar, and white ash; there is also an occasional gray or yellow birch. Gray and silky dogwood, Arrow-wood, and maple-leaf viburnum are found especially when fields are adjacent to the red maple types. Common juniper and sassafrass tend to be found on the drier sites.

Area #4 is cropland abandoned fifteen to twenty years. Some grasses left, but the area is mostly trees such as red cedar, pignut hickory, black birch, black oak and scarlet oak with some gray birch and sassafrass. Most of the gray dogwood and silky dogwood are gone but flowering dogwood is found in some areas. Blueberry, common juniper, red cedar, bayberry, black birch, and shadbush are found in the understory.

Areas 11-14 are red maple or hardwood swamp type. The term hardwood swamp may be misleading in that with the exception of areas listed as 12a, there is little standing water. These are drainage areas with a soil type that provides a slow downward movement of the surface water. In the days of extensive hand labor, all of the area except the stream course itself was a field, but seasonal wetness negated the use of machinery in recent years, and the areas have grown back to woodland.

Area #11: This is "cutover" or "sproutland." Tree species include red maple, American elm, white ash, black oak, red oaks, and black birch. A list of shrubs in the area include: ironwood or musclewood, poison sumac, spice bush, sweet pepperbush, blueberry, red cedar, speckled alder, black alder, elderberry, Arrow-wood, fox grapes, and beaked hazelnut.

Area #12: This is also red maple type with the overstory trees two to eight inches in diameter. Mostly the overstory is red maple with scattered white ash, black birch, and American elm. In a few areas there is swamp white oak,

black gum, or tupelo present. The understory is usually spicebush and blueberry. Sweet pepperbush, gray dogwood, silky dogwood, and Arrow-wood are found in the fringe between the old field type and the closed red maple stand.

Area #12A: This has the same size trees as Area #12 but there is much poorer drainage. In the wettest areas there are grass hummocks. The ash is brown ash rather than white. The understory includes mostly spicebush and blueberry with a noticeable amount of poison sumac. This area is most subject to species change if there is any change in the water table.

Area #13 is red maple type six to twelve inches in diameter. There are still a few white ash and American elm present. The understory is mostly spicebush and ironwood with lesser amounts of sweet pepperbush and blueberry present. Although these areas are quite thick with underbrush, they are very different from 12a in that they have a definite water channel so that the water runs off and there is very little standing water. There may be small depressions that retain water for longer periods.

Area #14 is red maple type more than twelve inches in diameter. This is a mature stand with many openings in the crown canopy allowing a profusion of woody trees and shrubs to flourish including: American elm, white ash, poison sumac, spicebush, sweet pepperbush, black cherry, red oak, red cedar, black alder, speckled alder, elderberry, Arrow-wood and fox grapes.

Area 23-24 are upland mixed hardwood types.

Area #23: This is predominately a pole sized stand with trees being six to ten inches in diameter with a scattering of larger trees. The primary species include: black oak, red oak, scarlet oak, red maple, sassafrass, and black birch. There are a few scattered white ash and in the moister areas some tupelo, swamp white oak, and white pine.

Blueberry and ironwood are appearing in the understory along with seedling sassafrass and red maple.

Area #24: This is predominately a sawlog size stand with the overstory trees being more than twelve inches in diameter. Major species include: black oak, red oak, white oak, black birch, pignut and hickory, and white ash. There are occasional shagbark hickories also.

Understory species include: pignut hickory, black birch, American elm, chestnut, Arrow-wood, blueberry, American beech, and sassafrass.

Most of the area appears to be in various stages of reverting from open cropland or grassland to forest. The soils are suitable so that eventually this area would be quite a productive forest. However, the best timber production management would dictate planting of the open and semi-open areas to a suitable timber crop species.

The Natural Diversity Data Base of the DEP's Natural Resource Center does not list any rare or endangered species of plants or animals for the area. Those plants and animals that are listed as possible to the area were not seen in traversing the area.

Barring a change in the water table due to development, it appears that industrial development in the area would only affect that area that is directly involved in actual construction.

WILDLIFE

The area proposed for industrial development is approximately two-hundred acres in size. It is composed of mature woodlands, actively farmed and reverting farmland, and a large wetland area. At present, the area is a mixture of cover types, with the variety and interspersion of these various cover types that makes excellent wildlife habitat.

The mature woodlands are composed mainly of white and red oak (Quercus alba, Q. rubra), white ash (Fraxinus americana) and black birch (Betula lenta). The understory contains several species of dogwoods (Cornus spp.) and winterberry (Ilex verticillata).

Part of the area is leased to a farmer. Several fields are used for hay production and several others are used for growing corn. Several fields have not been used recently and are reverting to woody harbaceous plants and young trees.

The large wetland is a dominate feature and is located in the middle of the proposed development site. Red maple (Acer rubra) with an understory of winterberry (Ilex verticillata) characterizes the wetland. A brook and several small ponds situated in the wetland are seasonally intermittent. A small pond off Route 138 was filled in by a commercial nursery. This resulted in an increased amount of water to be drained into the wetland system. Any industrial building in the wetland should be avoided. The developers are proposing to channelize the flow of water through the wetland. No plan of channelization was presented so it is difficult to project just what changes will occur in the wetland because of this. Channelization may result in dryer soils overall and may cause changes in the vegetation from wetland types to those more tolerant of dryer conditions. It may also result in the slower growth of wetland vegetation that have a high demand for water. It is recommended that as much of the water as possible naturally draining into the wetland and absorbed be allowed to continue to do so. An improvement to the wetland as a whole would be to create some permanent year round bodies of water by enlarging some of the natural depressions and/or small ponds and digging a catch basin in the middle of the wetland to create a year round pond. These bodies of water could be fed by the naturally high water table and the flow of water from the channelization procedure.

Considerations should be given to the potential mosquito problem as wetlands are the natural breeding ground of mosquitos.

Wherever possible, an edge that is a border of early successional shrubby-brush vegetation occuring between the borders of two cover types should be left and maintained. An example of this would be leaving a strip along a stone wall uncut and undeveloped. Whenever possible, buffer zones, areas left undeveloped and uncut between areas of development should be left.

All wildlife has three basic needs: food, water and cover. Often these cannot be met in a small restricted area. Corridors of travel, small areas left undeveloped or uncut, provide cover for wildlife traveling from one area to another to meet these needs. In the case of the proposed development the overall plan of development should provide for these corridors between each individual industrial plant out to the larger tracts of undeveloped land in the surrounding area. A buffer zone or edge can serve as a corridor but a corridor must be continual from one area to another area so that wildlife will have cover as they travel.

If possible, the entire development should be viewed as a whole leaving patches of interconnecting undeveloped land between industrial plants and parking lots that connect with dryer areas of undeveloped land outside the development. For example, the wetland should not be totally cut off as an island surrounded by industrial plants; there should be some corridor of travel from the wetland to surrounding areas of undeveloped land.

Wildlife should be considered when planning the landscaping around the industrial plants. If done properly, the landscaping will provide food, cover, and den/nesting sites. Several species useful to wildlife and used in landscaping are autumn olive (Elaegnus unbellata), honeysuckle (Lonicera spp.), and many species of dogwood (Cornus spp.).

As proposed, the entire piece of land will be subdivided and then sold. Because of this, planning could be done to incorporate the above recommendations into the overall plan of development before any sales are made.

UTILITIES

There are, no doubt, a number of factors which are involved and must be evaluated in assessing the feasibility and economics for an industrial park development. It might be said the land in question is a transitional area on the fringe of the Borough and without the availability of public water or public sewers at the present time. Certainly these two components would appear to be necessary factors in order to attract responsible industry, while assuring a safe, potable water supply and satisfactory means for the long-term disposal of sewage and industrial effluent. Maintaining the quality of surface and ground water should be of paramount importance. Without such facilities one must have a more detailed study and evaluation of overall site conditions and suitability, particularly as it could relate to and reflect the density of development. Where terrain and soil conditions are not favorable to provide space for both water wells and on-site sewage systems large sites and less dense development would be in order.

In terms of public water and sewage, there should be assurance of and a firm commitment from the sponsors of the park for the extension of the facilities as well as any necessary approvals from the water company, local and/or state agencies for actual use for the stated purpose. In particular, where the quantity of water exceeds 5,000 gallons per day or where industrial wastes would be involved, a permit(s) to discharge would have to be obtained from the Department of Environmental Protection.

It is noted water supply would be from a private water company. In addition to water main extension, a sizable water storage tank is also proposed for the park to meet industrial users needs and for fire protection. Both water and sewer mains would have to cross the Connecticut Turnpike which probably would result in increased costs for design and installation. It is understood the sewage treatment plant has excess capacity to take additional flow. In conjunction with the plant operation, it is also understood that a considerable percentage of the existing sewers are combined sewers (storm and sanitary) which increases flow during wet periods. A program to separate such sewer lines, particularly if additional flow from the proposed industrial park was substantial, would seem desirable, if not necessary.

Water Supply

It is planned at this time that the proposed industrial park would be supplied with water by the Jewett City Water Company which supplies the developed portions of the Town of Griswold. According to the regional water supply plan,* the 1975 water demand on that company's system was 710,600 gallons per day. The projected 1985 demand was 888,595 gallons per day, while the system's safe yield was 1,030,000 gallons per day. Thus, the plan indicates that there should be a surplus of water available. However, the engineering feasibility study for the industrial park should address not only the question of the water needs of the park, but the system capacity available to supply that need. Currently, the water service ends approximately 2,500 feet north of the site along Route 138. The engineering study should also address the question of the adequacy of the existing water pipe along Route 138 and determine whether that pipe should be replaced or merely extended to the site. In either case, it appears feasible to supply the park with water from this source, but this should be confirmed by a detailed study. Cost estimates should also be made.

It should be noted that the bedrock aquifer underlying the site could be utilized to supplement the proposed water supply. The anticipated yield, however, is comparatively small. It is estimated that at 85 percent of the sites in the Quinebaug River Basin, a well penetrating 100 feet of bedrock could supply at least 3 gpm. (Source: Water Resources Bulletin #19 Quinebaug River Basin) Storage tanks may be needed for some industrial uses depending upon the total daily demand, as well as for fire protection if such a concern exists.

Waste Disposal

The situation with sewer service to the park is essentially similar to that of water service. It is planned that the industrial park would utilize the existing Town of Griswold sewerage disposal system. That service extends to within about 3,500 feet of the northern boundary of the park site. There should be no problem in carrying the sewer service lines across the Connecticut Turnpike, but detailed feasibility and cost studies will have to be made.

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*Water Supply Plan for the Southeastern Connecticut Planning Region, SCRPA, 1977.

Under Connecticut's 1980 ground water quality standards, this site is listed as GA. The discharge of industrial process wastewater to any on-site disposal system is not consistent to these standards and therefore would not receive the required permits. (Any industrial discharge requires a permit from the DEP - Water Compliance Unit.)

The GA classification restricts on-site disposal to domestic sewage and some biodegradable wastes. Out of this 200 acre site, roughly only 100 acres are suitable for development due to wetland restrictions. Without a detailed engineering report, it is unknown if this site could handle the domestic waste flow from a typical 100 acre industrial park. Any community systems or individual systems with flows greater than 5,000 gallons per day would require a permit from the DEP - Water Compliance Unit. It appears that municiple sewers are required to make the proposal feasible.

While the overall feasibility of developing a number of industrial sites on the subject property without public sewer service would not appear to be realistic, some portions apparently have much more favorable soil conditions for on site sewage disposal. In particular, the mapped areas having Canton and Charlton type soils. Of course these areas, as well as others, would be subject to detailed testing and evaluation. For the most part, other areas of the property are wet or would tend to have seasonal high ground water due to perched water conditions.

Industrial development as well as other types of development can be a potential source of surface and/or ground water pollution if due precautions and care in operational procedures and maintenance are not taken. Also, there are many types and sizes of industries which would have varying impact on the surroundings. Screening and evaluation of any potential industry could lessen this aspect. No doubt there could be some degradation to surface water due to construction activities, runoff from paved areas. However, with proper planning and implementation it should be possible to minimize the effect. Some trade off for development of the land would seem to be unavoidable.

Electric Service

Questions have also been raised about the adequacy of electric service. Cost estimates for the provision of this service will be necessary.

PLANNING CONCERNS

The site consists of approximately 200 acres of which 80 acres to 120 acres are considered to be developable.* It is bounded on the north by the Frontage Road along Route 52, on the west and south by strip residential development along

*Preapplication for Planning of Industrial Park Development Project, Griswold, Connecticut, January 12, 1983, Moffit and Duffy Consulting Engineers.

Route 138 and Brewster Road, and on the east by an area of old fields and woodlands.

In the recent past, much of the area was used for agriculture, and some of it is still actively farmed. As mentioned above, there is a considerable area of wetlands, generally in the southern portions of the property. Slopes are generally small. Those areas which are not wetland seem well suited to construction of industrial facilities.

Impact on Adjacent Land Uses

Since much of the land surrounding the site is in residential use, it will be important to minimize any adverse impacts from industrial development. Two general types of impacts will be discussed here. These are traffic impacts and visual impacts. Potential problems and impacts from water pollution are discussed in other sections of this report.

The site appears to lend itself very well to minimization of traffic impacts. A telephone call was made to the Connecticut Department of Transportation to check on the feasibility of locating the principal access to the industrial park on the frontage road along Route 52 between Routes 138 and 164. We were told that such a plan was feasible. Another possible access would be at Barber Road, which runs between Routes 164 and 138, bisecting the site. This is a disused farm road. However, its utilization could severely impact adjacent residential areas. On the other hand, access from the frontage road would be well removed from any existing houses, and would be extremely convenient for traffic destined for the industrial park from the Connecticut Turnpike. The project site extends along the frontage road for about 2,000 feet, which means that more than one access point would be possible, thereby permitting the interior areas of the park to be served by a loop road which would have no impact on adjoining properties.

The proximity of the site to the Connecticut Turnpike means that one of more industrial firms could enjoy the advantage of high visibility from the Turnpike, but yet remain screened from residential areas. Access from the frontage road would seem to be compatible with this concept.

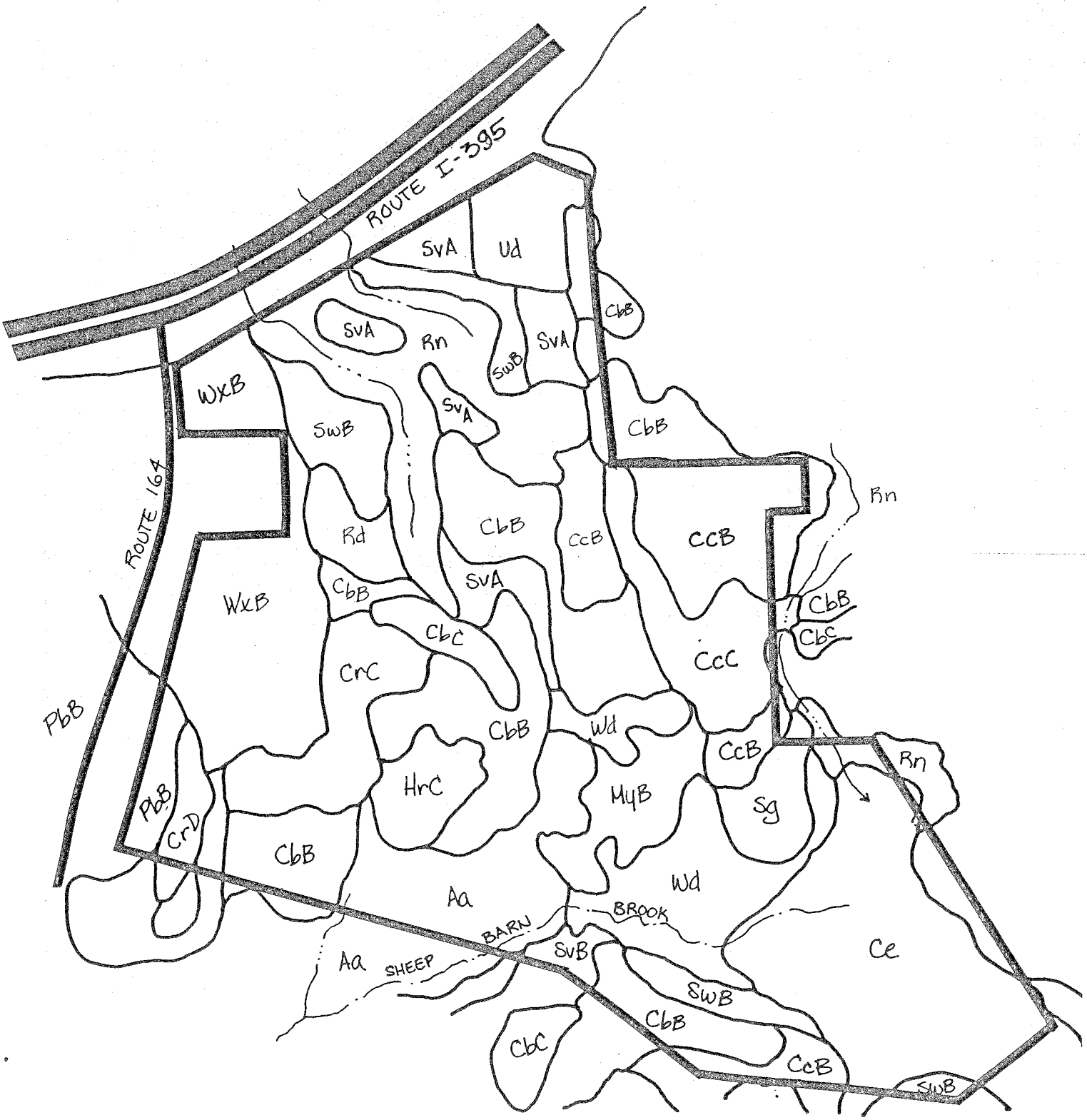
The visual impact of industrial development can be controlled by buffering and screening. A good local example of where this has been done is the Norwich Industrial Park, which is bordered in several locations by residential neighborhoods. There, naturally wooded areas have been utilized to screen the industrial facilities from view. At the Griswold site, there are perhaps fewer areas of woodland which lend themselves to this purpose, since much of the developable property consists of open fields. There are some areas of woodlands, notably along the watercourses and wetlands. These should be utilized in the site planning process to perform the screening function wherever possible, as well as to preserve the natural drainage and biologic characteristics of the area. However, it will be necessary to require that purchasers of lots in the industrial park provide planted buffer strips between their properties and neighboring non-industrial uses because of the fact that much of the buildable land adjacent to residential areas consists of fields.

Zoning

The discussion of buffer strips brings up the topic of zoning requirements for the industrial park. A zone change will be necessary if the park is to go forward, since the northern portion of the site is zoned C-1 (Village Commercial) and C-2 (Highway Commercial). The southern part of the site is zoned R-40 (Single-family residential with a lot size of 40,000 square feet), and R-60 (Single-family residential with a lot size of 60,000 square feet). The industrial park would require a change to the I-District, which permits light industrial activities. The uses permitted in this District can be summarized as light industry, truck terminals and warehouses, research laboratories and printing and publishing. These all seem compatible with the industrial park proposal. It does not appear that the list of permitted uses in the regulations would need to be changed for the industrial park. While there are requirements for buffer strips in the regulations, it appears that these should be reviewed and strengthened if this project goes forward. Mention was made above of the use of natural woodlands for screening and buffering. This brings up the subject of site planning in general. The Griswold Planning and Zoning Commission will have to review a subdivision plan for the park, if the project goes forward. It is important that the visual aspects of the park design be given proper weight, in the Commission's deliberations, along with such other considerations as traffic circulation and drainage.

Appendix

Soils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CbC
CrC
Ccc
PbB
CbB
Wd
CcB
Rn
PbB
CrD
HrC
MyB
Sg
CbB
Wd
Aa
BROOK
BARN
Ce
Aa
SHEEP
SvB
SwB
CbB
CbC
CcB
SwB

SYMBOL	NAME
Aa	Adrian and Palms mucks
CbB	Canton and Charlton fine sandy loams, 3 to 8 percent slopes
CbC	Canton and Charlton fine sandy loams, 8 to 15 percent slopes
CcB	Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes
CcC	Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes
CdC	Canton and Charlton extremely stony fine sandy loam, 8 to 15 percent slopes
Ce	Carlisle muck
CrC	Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes
CrD	Charlton-Hollis fine sandy loams, very rocky, 15 to 45 percent slopes
HrC	Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes
MyB	Merrimac sandy loam, 3 to 8 percent slopes
Rd	Ridgebury fine sandy loam
Rn	Ridgebury, Leicester, and Whitman extremely stony fine sandy loams
Sg	Sudbury sandy loam
SvA	Sutton fine sandy loam, 0 to 3 percent slopes
SvB	Sutton fine sandy loam, 3 to 8 percent slopes
SwB	Sutton very stony fine sandy loam, 0 to 8 percent slopes
Ud	Udorthents-Urban land complex
Wd	Walpole fine sandy loam
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes

PROPOSED INDUSTRIAL PARK
GRISWOLD

Principal Limitations and Ratings of Soils for Building Site Development

SOIL MAP SYMBOL AND SOIL NAME	DWELLINGS WITHOUT BASEMENT	DWELLINGS WITH BASEMENTS	LAWNS AND LANDSCAPING	SMALL COMMERCIAL BUILDINGS	LOCAL ROADS AND STREETS
*Aa - Adrian and Palms	Severe-ponding, low strength	Severe-ponding	Severe-excess humus, ponding	Severe-ponding, low strength	Severe-ponding, low strength, frost action
#CbB -					
Canton	Slight	Slight	Slight	Moderate-slope	Slight
Charlton	Slight	Slight	Slight	Moderate-slope	Slight
CbC -					
Canton	Moderate-slope	Moderate-slope	Moderate-large stones, slope	Severe-slope	Moderate-slope
Charlton	Moderate-slope	Moderate-slope	Moderate-large stones, slope	Severe-slope	Moderate-slope
CcB -					
Canton	Slight	Slight	Moderate-large stones	Moderate-slope	Slight
Charlton	Slight	Slight	Moderate-large stones	Moderate-slope	Slight
CcC -					
Canton	Moderate-slope	Moderate-slope	Moderate-large stones, slope	Severe-slope	Moderate-slope
Charlton	Moderate-slope	Moderate-slope	Moderate-large stones, slope	Severe-slope	Moderate-slope
CdC -					
Canton	Moderate-slope	Moderate-slope	Moderate-large stones, slope	Severe-slope	Moderate-slope
Charlton	Moderate-slope	Moderate-slope	Moderate-large stones, slope	Severe-slope	Moderate-slope

*Designated inland wetland soil by Public Act 155

PROPOSED INDUSTRIAL PARK
GRISWOLD

Principal Limitations and Ratings of Soils for Building Site Development (Continued)

SOIL MAP SYMBOL AND SOIL NAME	DWELLINGS WITHOUT BASEMENT	DWELLINGS WITH BASEMENTS	LAWNS AND LANDSCAPING	SMALL COMMERCIAL BUILDINGS	LOCAL ROADS AND STREETS
*Ce - Carlisle	Severe-ponding, low strength	Severe-ponding, low strength	Severe-ponding, excess humus	Severe-ponding, low strength	Severe-ponding, frost action
CrC -					
Charlton	Moderate-slope	Moderate-slope	Moderate-large stone, slope	Severe-slope	Moderate-slope
Hollis	Severe-depth to rock	Severe-depth to rock	Severe-thin layer	Severe-depth to rock	Severe-depth to rock
CrD -					
Charlton	Severe-slope	Severe-slope	Severe-slope	Severe-slope	Severe-slope
Hollis	Severe-slope, depth to rock	Severe-slope, depth to rock	Severe-slope, thin layer	Severe-slope, depth to rock	Severe-depth to rock slope
HrC -					
Hollis	Severe-depth to rock	Severe-depth to rock	Severe-thin layer	Severe-depth to rock	Severe-depth to rock
Charlton	Moderate slope	Moderate-slope	Moderate-large stones, slope	Severe-slope	Moderate slope
#MyB - Merrimac	Slight	Slight	Slight	Moderate-slope	Slight
*Rd - Ridgebury	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness, frost action
*Rn -					
Ridgebury	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness, frost action
Leicester	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness, frost action
Whitman	Severe-ponding	Severe-ponding	Severe-ponding	Severe-ponding	Severe-frost action, ponding

*Designated inland wetland soil by Public Act 155
#Prime farmland soil

PROPOSED INDUSTRIAL PARK
GRISWOLD

Principal Limitations and Ratings of Soils for Building Site Development (Continued)

SOIL MAP SYMBOL AND SOIL NAME	DWELLINGS WITHOUT BASEMENT	DWELLINGS WITH BASEMENTS	LAWNS AND LANDSCAPING	SMALL COMMERCIAL BUILDINGS	LOCAL ROADS AND STREETS
#Sg - Sudbury	Moderate-wetness	Severe-wetness	Slight	Moderate-wetness, slope	Moderate-wetness, frost action
#SvA, SvB - Sutton	Moderate-wetness	Severe-wetness	Moderate-wetness	Moderate-wetness,	Severe-frost action
SwB - Sutton	Moderate-wetness	Severe-wetness	Moderate-large stones, wetness	Moderate-wetness, slope	Severe-frost action
*Wd - Walpole	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness, frost action
#WxB - Woodbridge	Moderate-wetness	Severe-wetness	Moderate-wetness	Moderate-wetness, slope	Severe-frost action

Ud - Udorthents - Urban land complex: Requires on-site investigation

*Designated inland wetland soil by Public Act 155
#Prime farmland soil

SOIL INTERPRETATIONS FOR URBAN USES

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

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

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

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

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

About the Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area.

The Team is available as a public service at no cost to Connecticut towns.

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 activitis. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

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 officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner 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 Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.