Anticipated Commercial Development

North Stonington, Connecticut
December 1985

ENVIRONMENTAL REVIEW TEAM REPORT

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Anticipated Commercial Development

North Stonington, Connecticut

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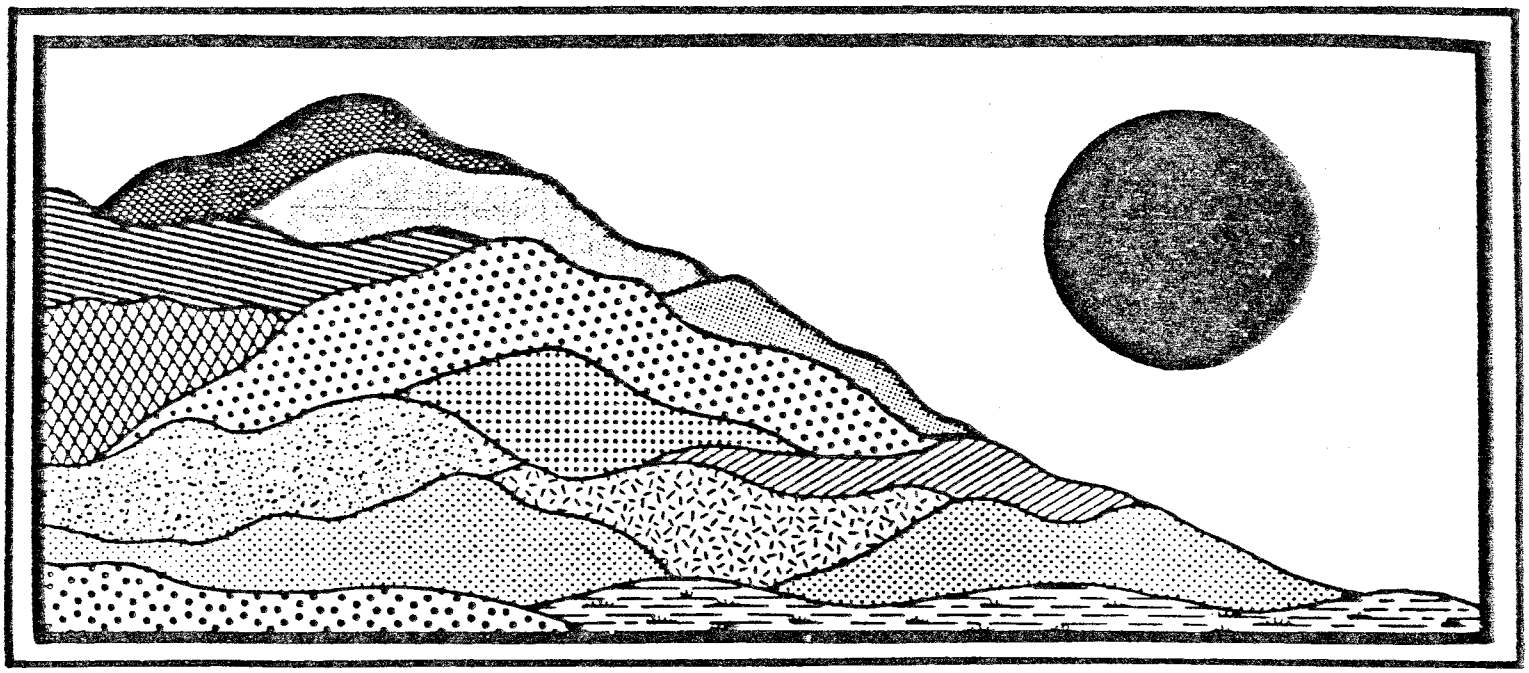


ENVIRONMENTAL REVIEW TEAM REPORT

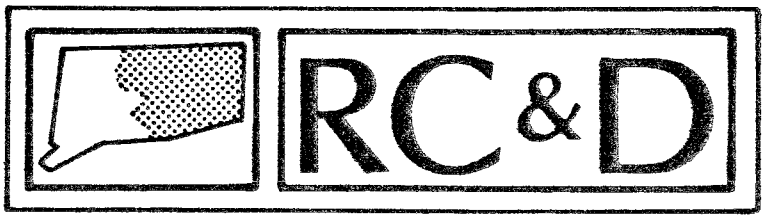
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Anticipated Commercial Development

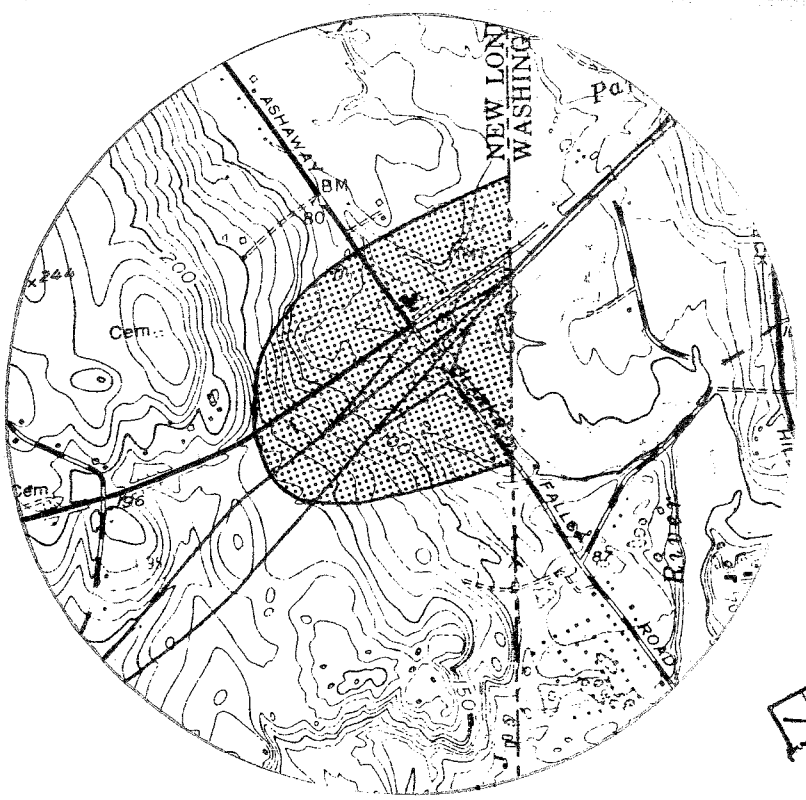
North Stonington, Connecticut

Review Date: SEPTEMBER 12, 1985

Report Date: DECEMBER 1985



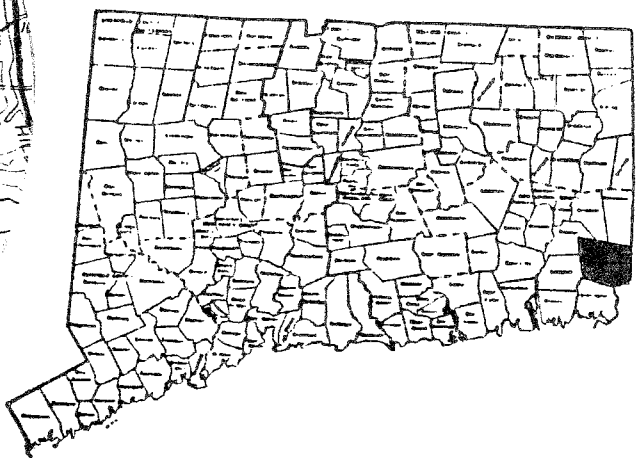
ENVIRONMENTAL REVIEW TEAM
PO BOX 198
BROOKLYN, CONNECTICUT 06234



Site Location

ANTICIPATED COMMERCIAL DEVELOPMENT

NORTH STONINGTON, CONNECTICUT



EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT
ON
COMMERCIAL DEVELOPMENT
INTERSECTION OF ROUTES 184, 216 and I-95
NORTH STONINGTON, CONNECTICUT

This report is an outgrowth from the North Stonington Planning and Zoning 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 Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on Thursday, September 12, 1985. Team members participating on this review included:

Gerry Amt - Regional Planner-Southeastern CT Regional Planning Agency
Don Capellaro - Sanitarian-CT Department of Health
Barry Cavanna - District Conservationist-USDA, Soil Conservation Service
Elaine Sych - ERT Coordinator-Eastern CT RC&D Area
Bill Warzecha - Geologist-DEP, Natural Resources Center

Prior to the review day, each team member received a summary of background information, the Commission's concerns, a location map, and a soils map. A large scale topographic map was handed out the day of the review. The Team met with, and were accompanied by, a member of the P&Z Commission and Harry Siebert, a planner with the CT Department of Transportation. Following the review, reports from each team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project--all final decisions and conclusions rest with the Town and the landowner. This reports identifies the existing resource base and evaluates its significance to proposed development, and also suggests considerations that should be of concern to the Town and any developer. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut Resource Conservation and Development Area hopes you will find this report of value and assistance in making your decisions concerning this area.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern CT RC&D Area
P.O. Box 198
Brooklyn, CT 06234
(203) 774-1253

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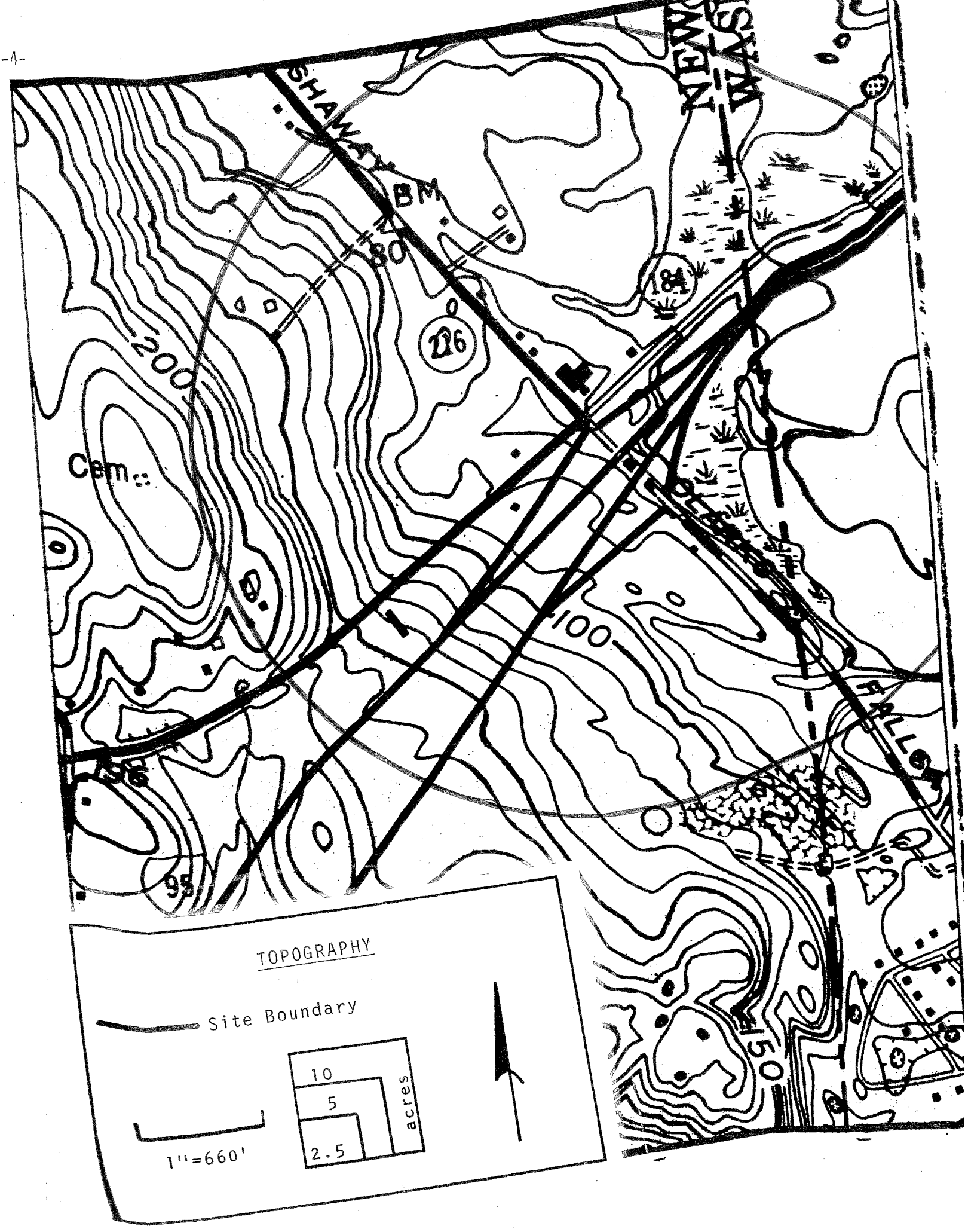

SHAWAN
BM
80
216
184
200
Cem.
100
96
95
150
FALLS
TOPOGRAPHY
Site Boundary
10
5
2.5
acres
1"=660'

I. INTRODUCTION

The North Stonington Planning and Zoning Commission has asked for Environmental Team assistance in reviewing property in the area of the intersections of Routes 184 and 216 and Interstate 95.

The land area in question extends approximately 1,000 feet north and south of the interchange (along Route 216) and about 2,000 feet to the west and around 1,000 feet east to the Rhode Island state line. It is understood that at the present time, the land is zoned highway commercial and the town, through the Planning and Zoning Commission, has some reservations that future development in the area, which constitutes part of a large, designated aquifer, would or could have an adverse impact on the existing ground water resource. The land areas lie within the watershed of the Ashaway River.

The intent of the Town is to protect the aquifer by careful screening, requirements, and/or restrictions of future commercial uses.

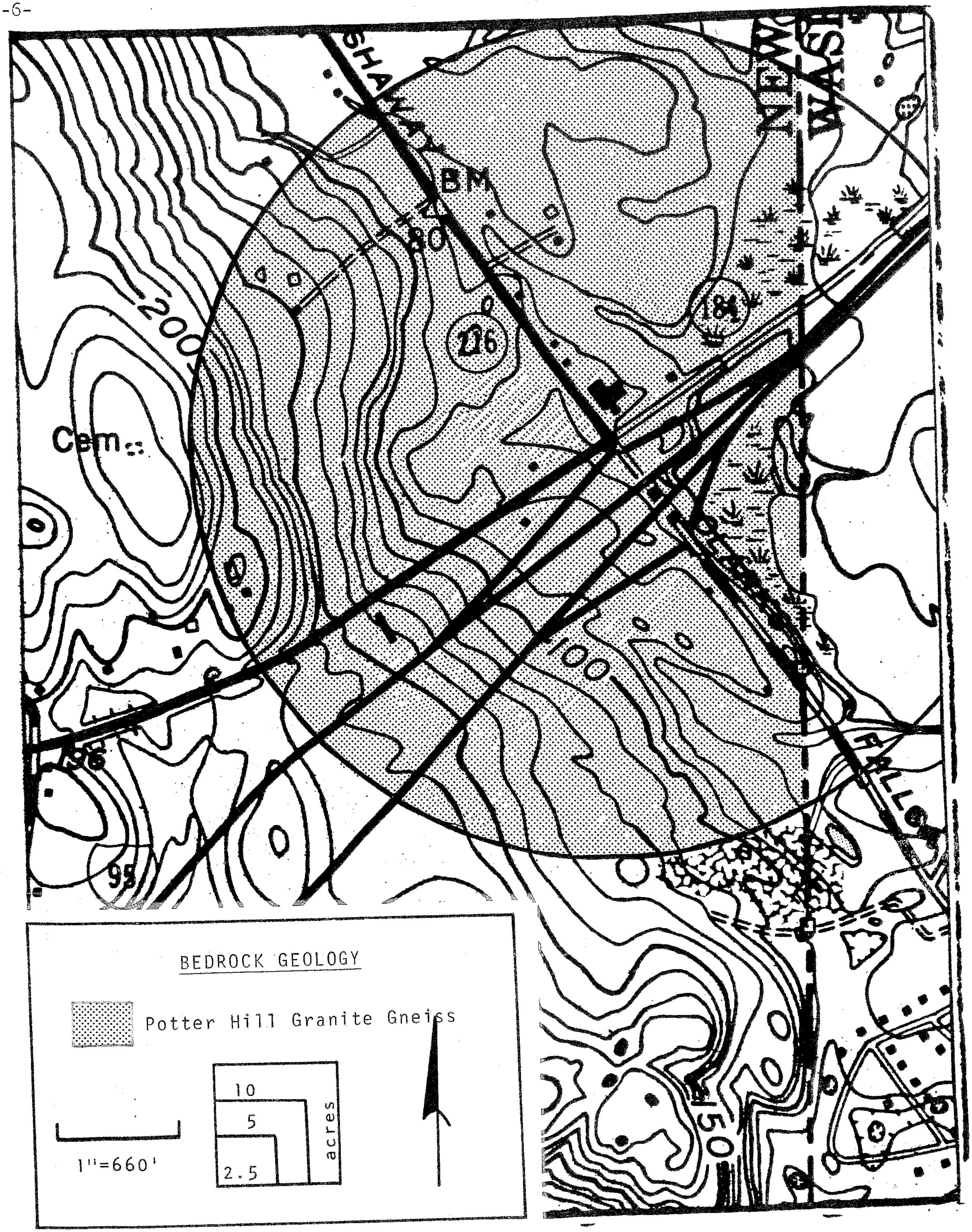
At the present time, this area has a mix of commercial businesses such as several restaurants, motel, service station(s), truck stop, and offices, and while some of these businesses generate wastes similar to domestic sewage, others deal with stronger wastes, and hazardous chemicals such as solvents and hydrocarbons.

This report will provide recommendations as to general considerations and cautions that they should be made aware of when considering applications for commercial uses.

Readers should be made aware that two previous ERT reports (Cherenzia Property and Platt Property) published in August 1984 and June 1982, respectively, are encompassed by the study area and should be referenced by interested persons.

II. TOPOGRAPHY

The study area is characterized by slopes which range from moderate to generally flat. The western parts of the study area slope moderately to about the 100 foot contour line on the accompanying topographic map. From this point to the Rhode Island state border, the terrain ranges from gently rolling to some relatively flat areas. The topography in this area is controlled largely by those unconsolidated materials (sand and gravel) overlying bedrock. Elevations in the study area range from a high of about 230 feet above sea level in the western portions, to a low of about 50 feet above mean sea level along Ashaway River.


BEDROCK GEOLOGY
Potter Hill Granite Gneiss
10
5
2.5
acres
1"=660'
Cem
200
100
150
BM
226
184
95

Ashaway River and its accompanying wetlands comprise the eastern border of the study area. Drainage in the study area has been altered considerably due to the construction of I-95. This will be discussed in more detail in the Hydrology section of the report. A small farm pond is located on the west side of Route 216 in the northwest corner.

III. GEOLOGY

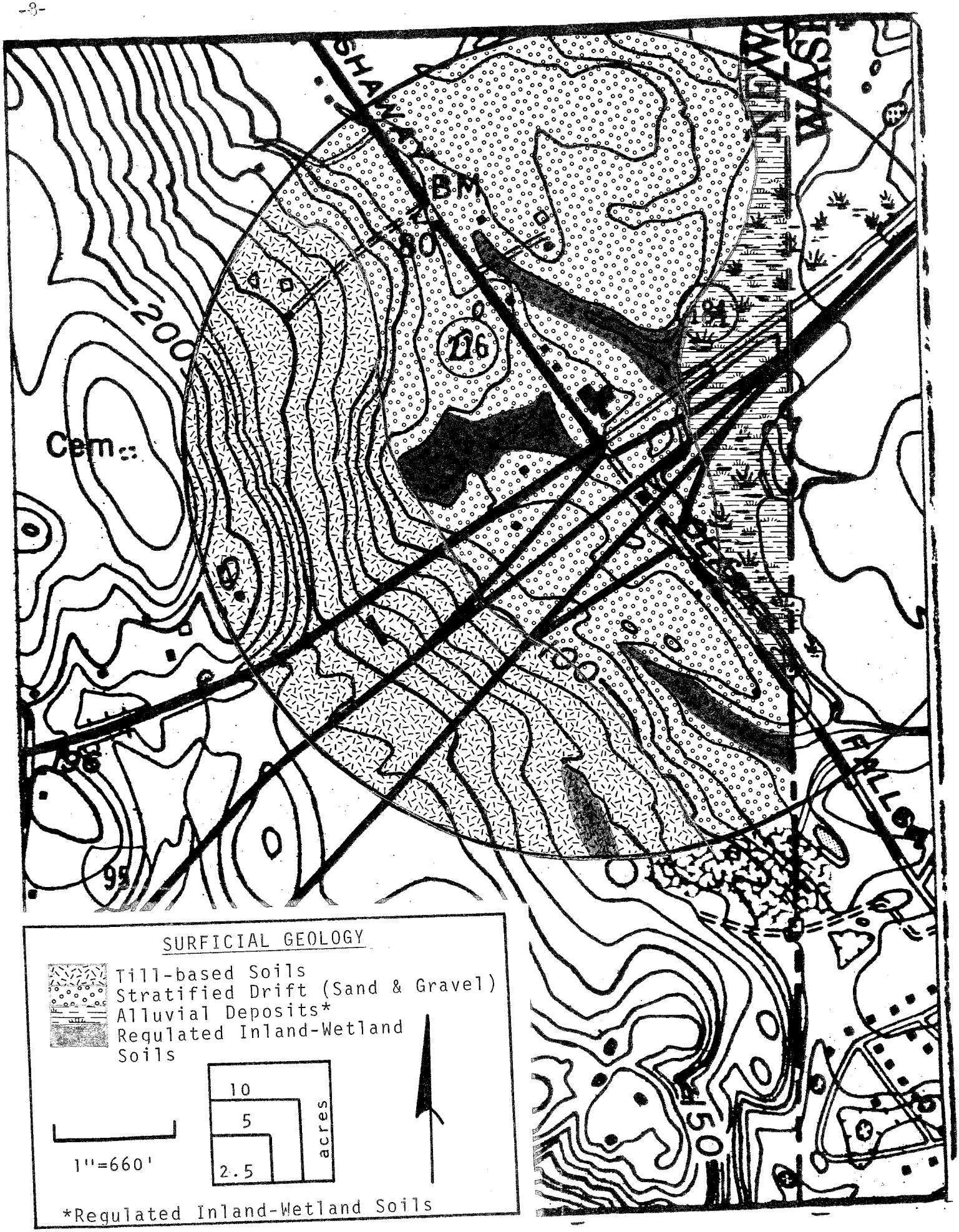
The site lies entirely in the Ashaway topographic quadrangle. Both the bedrock geologic map (GQ-712, by Thomas Feininger) and the surficial geologic map (GQ-403, by J. P. Shaefer) for the quadrangle have been published by the U.S. Geological Survey. These maps can be acquired or reviewed at the Department of Environmental Protection's Natural Resources Center in Hartford.

Bedrock appears to break the ground surface in only two isolated spots in the study area; one in the northwest corner of the study area and the other in the southwest corner. Feininger identifies these rocks and the rocks underlying the entire area as Potter Hill Granite Gneiss. These rocks are described as fine to medium grained, orange to pink, very strongly foliated granite gneiss. The major minerals composing the rock includes microcline, quartz, oligoclase, and rarely albite, biotite, magnetite and minor muscovite. The size of these minerals are generally equal in size throughout the rock; hence, equigranular. Where these rocks break ground surface and have been exposed to weathering processes, they are generally deeply stained, crumbly and tend to be slabby.

A "gneiss" refers to a streaked or banded rock which has been subjected to great heat and pressure within the earth's crust. The banding in the rock results when layers of elongate or flaky minerals alternate with layers of granular minerals. Depth to bedrock in the study area ranges from zero, where it breaks ground surface, to perhaps as much as 80 feet below ground surface, east of Route 216. A log of a drilled well serving a residence just under three quarters of a mile north of the I-95/Route 216 intersection indicates that the bedrock surface was encountered at about 75 feet below ground surface.

The unconsolidated or surficial geologic materials overlying bedrock in the study area consists of till, stratified drift, swamp deposits, alluvium and artificial fill material. An accompanying surficial geologic map, adapted from Schaefer's map, shows the distribution of the above deposits in the study area.

Till deposits which cover the upland areas in western parts of the study area consist of rock particles of varied shapes and sizes. These particles were deposited directly by glacier ice without being reworked by meltwater streams emanating from the glacier ice. In the first 2-3 feet, the till is often relatively sandy and friable with moderate permeability. Stoniness is


SHAWAY
BM
200
Cem
FALLON
150
SURFICIAL GEOLOGY
Till-based Soils
Stratified Drift (Sand & Gravel)
Alluvial Deposits*
Regulated Inland-Wetland Soils
1"=660'
10
5
2.5
acres
*Regulated Inland-Wetland Soils

also characteristic of this zone. At a depth between 2 and 4 feet and, perhaps, greater, the till commonly becomes silty, very compact, and only slightly permeable. These conditions are especially characteristic of the soils (Paxton and Woodbridge soils on the accompanying soils map) in the upland areas in the northwest corner of the study area.

Since ground water tends to travel slowly through the compact zones, a seasonally elevated (perched) ground water table often results.

The thickness of the till is probably not much more than 10 feet throughout the study area except in the northwest corner where it is thicker, perhaps 20 feet to 40 feet thick.

Stratified drift, which consists of bedded and mostly well-sorted gravels and sands, covers most of the central and eastern parts of the study area. The upper 3-15 feet of the deposit is dominantly gravel in almost all places; the lower parts of many exposures show dominantly finer gravel or sand with some layers of silt. These deposits were laid down by the glacier meltwater streams as they retreated from the area. Sand and gravel were commonly deposited near the ice, while silt and clay were washed further downstream to be deposited in lakes or in the sea. Thickness of the stratified drift ranges from a few inches at the till-stratified drift contact to perhaps 80 feet east of Route 216.

Overlying till and stratified drift throughout the study area are pockets of both seasonally and permanently wet areas. The soils comprising these areas are regulated under Public Act No. 155. Filling, modifying or constructing in wetlands can have severe environmental impact because of their important value in maintaining water quality, reducing runoff, and providing wildlife habitats. As a result, any activity which involves filling, modifying, dredging or polluting of a wetland requires a permit from the Town's Inland-Wetland Commission and may be subject to public hearing.

The seasonally wet areas tend to parallel the intermittent drainage swales in the upland portion of the study area. The permanently wet areas overlie the stratified drift deposits in the central and eastern parts of the study area.

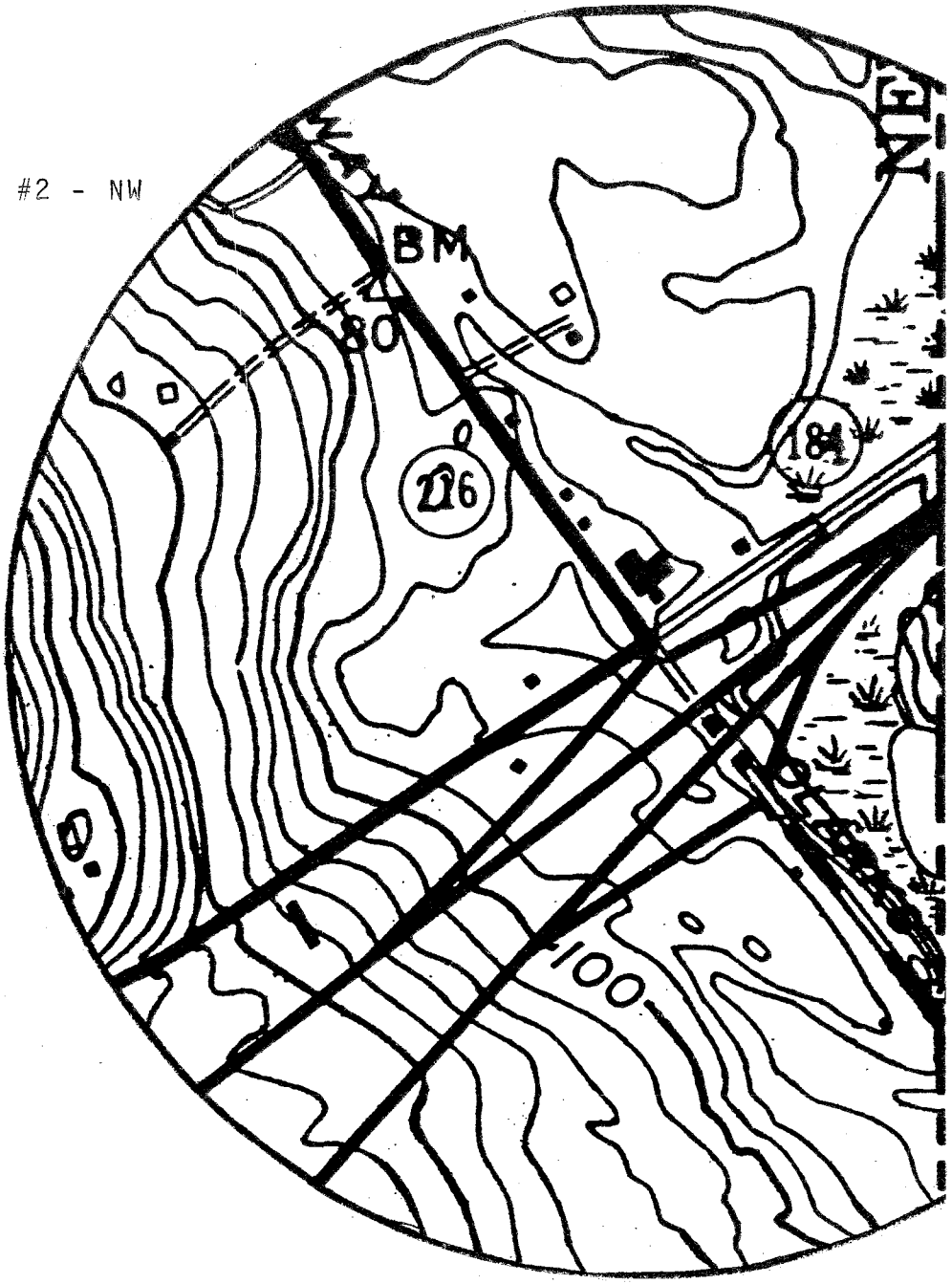
Alluvial deposits in the study area generally parallel Ashaway River in the eastern parts. These deposits consist of silt, sand, gravel and boulders found in the flood plains of Ashaway River.

Artificial fill in the study area consists of material such as gravel or till, placed by man for the construction of I-95 and Route 626. The thickness of the artificial fill is probably greater than 5 feet in most places.

QUADRANT LOCATION

#1 - NE

#2 - NW



#4 - SE

#3 - SW

IV. GEOLOGIC DEVELOPMENT CONCERNS

For the purpose of this report, the Team's Geologist has divided the study areas into four sections: (1) the northeast section which includes the land area east of Route 216 and north of Route 626; (2) the northwest section which includes the land area west of Route 216 and north of I-95; (3) the southwest section, which includes the land area south of I-95 and west of Route 216 (Clark's Falls Road); and (4) the southeast section, which includes the land area east of Clark's Falls Road to the Rhode Island state line and south of I-95 (see Quadrant Location Map).

It should be pointed out that prospective developments in the study area would need to rely on individual and/or community septic systems and wells.

Most of the study area is zoned HC or Highway Commercial Districts. A definition of the zone may be found under Section 304.5 of the Town's zoning regulations. The land area east of Route 216, Clark's Falls Road, also lies within the Town's AP or Aquifer Protection overlay area. A definition of the Aquifer Protection Zone may be found in Section 305.2 and 406 (Use Regulations) of the Town's zoning regulations. According to Section 406 of the Town's Use Regulations, sewage flows, exclusive of industrial wastes, in a non-residential district, such as the HC zone within the study area, shall not exceed 360 gallons per acre per day. There is additional information in this section of the Town's regulations that will need to be considered for future developments in the Aquifer Protection Zone (see Water Supply section of this report). A recent (September 1985) publication, "Land Use and Traffic-Highway Commercial Zoning District for North Stonington, Connecticut," prepared by the Southeastern Connecticut Regional Planning Agency, should be referenced for additional planning information.

From a geological standpoint, it appears that portions of the northwest and southwest sections of the study area appear to be at least moderately well suited for development. Because the southeast section is comprised almost entirely of wetland soils with the exception of a small filled area parallel to Route 216 and because most of it lies within the flood prone area of the Ashaway River, this portion of the study is not suitable for any type of development. Most of the northeast section of the study area has already been developed or is in the process of being developed. As a result, there appars to be very limited area in which to develop unless existing developments are razed and the area redeveloped. It should be kept in mind that the northeast and northwest sections of the study area lie within the Aquifer Protection and, therefore, would need to comply with the Town's regulations regarding this matter.

As mentioned earlier, future developments in the study area will need to rely on on-site subsurface sewage disposal systems. Soil mapping information noted in the Geology Section indicates that the eastern parts of the northeast and southeast sections are covered by stratified drift while the western parts are covered by till. The western parts are also characterized by moderate slopes. Wetland areas are scattered throughout both the above areas. These

geologic conditions, i.e., stratified drift, till base soils, inland-wetlands soils, will weigh differently on the ability to provide adequate subsurface sewage disposal systems.

Because of the highly porous nature of stratified drift deposits, it may not have the ability to provide for good filtration and renovation of septic tank effluent or other types of pollution. Ultimate dilution and dispersion of the ground water may occur where concentrations, hopefully, will not cause any significant or potentially harmful degree of degradation. Development in the area covered by stratified drift will need to be carefully evaluated by the Town sanitarian and project engineer, and should be within the limits of acceptable density as to the capacity of the soil.

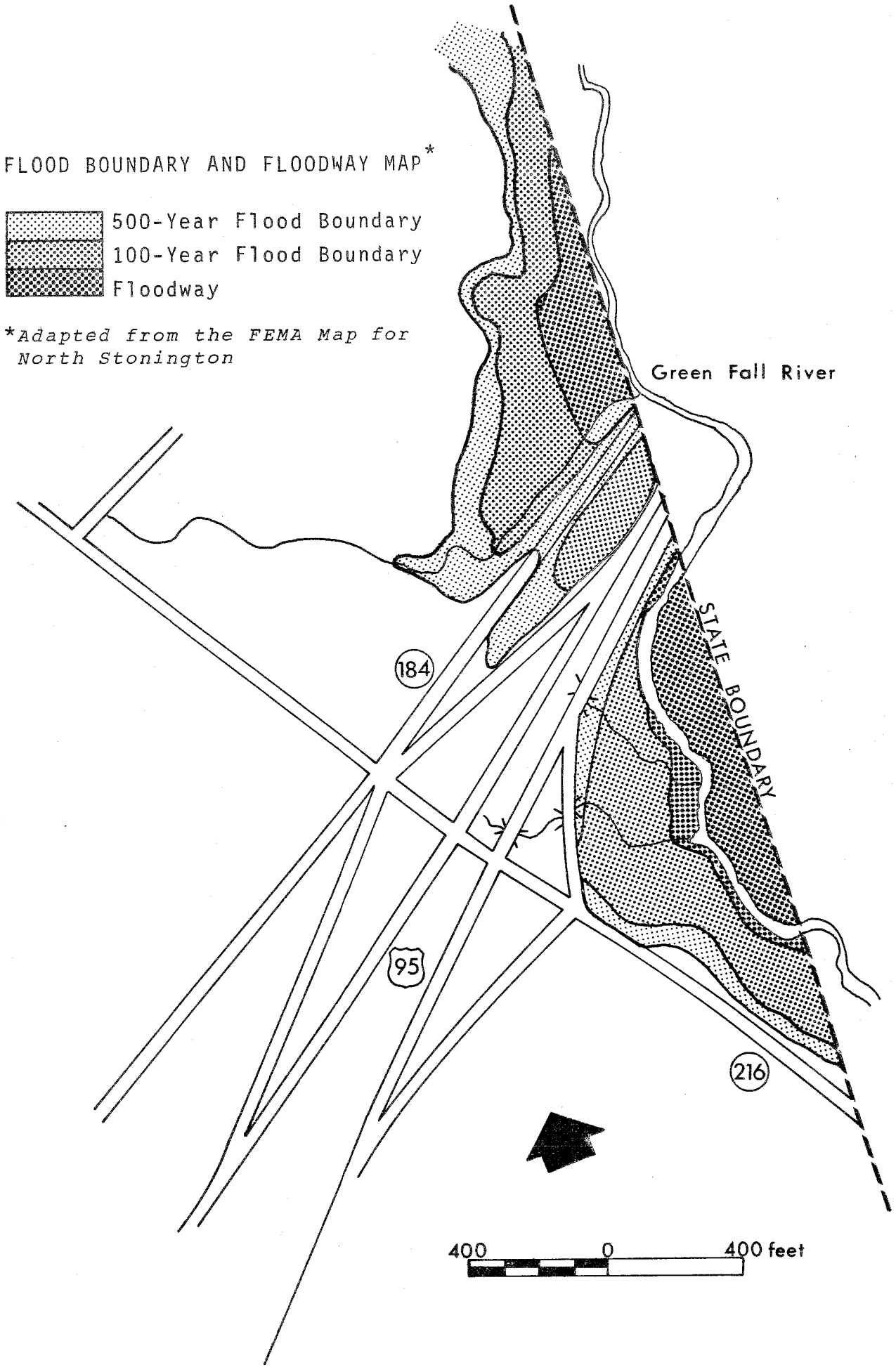
The till-based soils in the western portions may contain compact layers, which result in a seasonally high ground water table. They may also have low permeability rates, some shallow to bedrock areas and slow percolation rates. Detailed soil testing would need to be conducted in the till covered areas in order to determine its feasibility for a prospective development. It seems likely that the "standard" septic system would be limited in these areas, but some of the limitations mentioned above might be surmounted by properly engineered systems. As mentioned earlier in this section, the till soils will also need to be carefully evaluated by the Town sanitarian and project engineer, and should be within the limits of acceptable density to the capacity of the soil.

All potential Highway Commercial uses in the study area should require engineered design plans for sewage disposal systems. These plans should be submitted to the proper agencies, i.e., local and state health departments for review. It should be noted that if flows exceed 5,000 gallons per day or more, the plans would need to be submitted for review and ultimate approval by the State Department of Environmental Protection, Water Compliance Section.

All inland-wetland soils hold low potential for development and subsurface sewage disposal systems and, therefore, should be avoided. In addition, they are very important from a hydrologic as well as ecologic standpoint in that they maintain water quality, reduce runoff, cleanse water through biochemical processes and provide wildlife habitat. In this regard, the Town should consider having all prospective developers in the HC area submit plans which have inland-wetland boundaries superimposed on the plan. The inland-wetland soils should be flagged on a particular site by a competent certified soil scientist.

V. FLOOD HAZARD AREAS

A Flood Boundary and Floodway Map for the Town of North Stonington has been prepared by the Federal Emergency Management Agency. This study includes maps which identify areas throughout the Town that are subject to flooding during the 100 and 500 year storm. The map also shows the Ashaway River floodway or floodway fringes. A '100' year flood is a flood with a one chance in 100


FLOOD BOUNDARY AND FLOODWAY MAP*
500-Year Flood Boundary
100-Year Flood Boundary
Floodway
*Adapted from the FEMA Map for North Stonington
Green Fall River
STATE BOUNDARY
184
95
216
400
0
400 feet

or a 1 percent chance that it will happen in any year. A '500' year flood would have a one chance in 500 or a 0.2 percent chance of occurring in any given year. It should be pointed out that this does not mean a flood of the magnitude mentioned above will occur only once in a 100 or 500 year period. The probability of occurrences remains the same each year regardless of what happened the year before.

According to the map, the '100' year flood boundary parallels the Ashaway River in the eastern parts of the study area. Also, the boundary extends along a tributary to Ashaway River in the eastern parts of the study area. The '500' year flood boundary fringes the outer limits of '100' year flood boundary on the west side of the river.

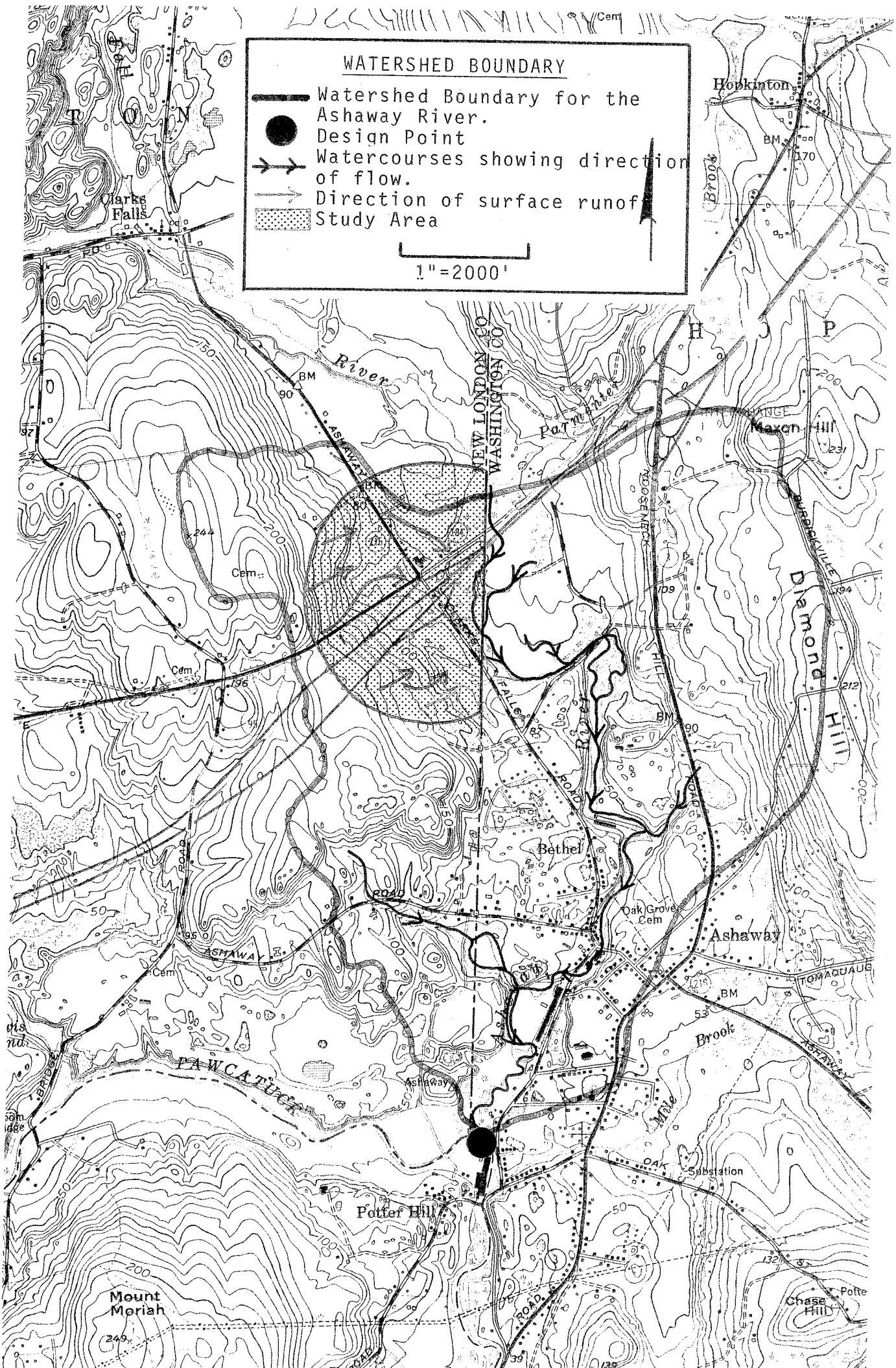
There may be swampy or topographic depressions within the site subject to wetness and perhaps flooding during periods of particularly heavy rain. An accompanying map, which was adapted from the FEMA map for North Stonington identifies the floodprone areas on the site.

VI. HYDROLOGY

The entire HC area lies within the Ashaway River watershed, which ultimately empties into the Pawcatuck River south of the study area. The two ERT reports discussed in the beginning of the report describe drainage in the northeast and northwest sections of the study area (see Hydrology sections of the Cherenzia Property and Platt Property). The publication, "Land Use and Traffic - Highway Commercial Zoning District," prepared by the Southeastern Connecticut Regional Planning Agency, also discusses drainage in the study area on page 3 of the report.

Surface drainage in the southeast and southwest sections of the study area is to the east. Surface runoff in the southeast section flows overland into the wetland areas parallel to Ashaway River. Surface runoff in the southwest section flows downslope until it reaches the drainage system along Clark Falls Road. It is then routed through culverts beneath the road and ultimately finds its way into the Ashaway River.

Development of the site for highway commercial purposes would be expected to increase the amount of runoff during periods of rainfall. These increases would result from soil compaction, removal of vegetation, and placement of impervious surfaces (rooftops, parking areas, etc.) over otherwise pervious soils. Since commercial development uses would probably require more impervious surface areas (as for parking lots and larger buildings), the runoff increases for that type of development would tend to be higher than for most other types of uses (e.g., recreation/open space, one acre residential lots).


WATERSHED BOUNDARY
Watershed Boundary for the Ashaway River.
Design Point
Watercourses showing direction of flow.
Direction of surface runoff
Study Area
1"=2000'
Hopkinton
Clarke Falls
Maxon Hill
Diamond Hill
Bethel
Ashaway
Potter Hill
Mount Moriah
Chase Hill
Oak Grove Cem
Substation
ASHAWAY R.
PAWCATUCK
NEW LONDON CO.
WASHINGTON CO.
ROAD
BM
Cem

It is suggested that the Town require each prospective developer in the study area to submit detailed hydrological information with their development plans. This information should include pre- and post-development runoff estimates from a particular site for the 10, 25, 50 and 100 year storm events. Close examination of all downstream culverts such as those passing under Route 216, Route 184, Route 626, and the drainage network for I-95. In some cases, it may be necessary for a developer to maintain post-development runoff flows from a site at present levels. The added runoff from a site or sites may also cause increased overland and stream channel erosion, and it may increase the peak flood flows of the streams it drains to. One likely resolution for maintaining off-site flows at present levels following a particular development would be to install a detention basin(s). It might be possible to combine this function with a sediment retention function. One area, which appears to lend itself to a possible detention is the wetland areas small pond at the corner of Route 216 and Route 184 opposite the Republic Truck Stop. If an applicant wishes to utilize a detention/sediment basin as a mitigative measure for handling post development flows, detail design specifications for it should be submitted and reviewed by all appropriate town officials.

Every effort should be made to protect affected streamcourses and ultimately the Ashaway River from sand and other road or parking lot debris. In this report, it is recommended that a comprehensive erosion and sediment control plan be submitted for each development proposal in the study area.

VII. AQUIFER PROTECTION

Certainly, any type of development could potentially cause pollution to an aquifer, whether such pollution would be significant or present a definite health hazard would depend upon the type, concentration and volume. It is generally recognized that commercial or industrial uses are the primary sources of ground water problems. This is not to imply that high density residential development would be of no concern. Domestic sewage contamination problems are mainly related to bacteria and viruses and possible nitrate enrichment. However, with properly designed and installed systems which are not overly dense on small lots, pollution of ground water is unlikely to occur. Where the soils, however, are highly permeable and ground water is relatively close to the surface, the potential for problems is greater.

1. When considering potential applications for commercial uses in a designated aquifer area, have an applicant submit a report regarding the amount and composition of the particular waste(s) to be generated.

2. It may be necessary to prohibit commercial activities that use hazardous materials. Certainly, such wastes must be disposed of in accordance with the requirements and standards established by the Department of Environmental Protection.

3. Limit the volume of sewage or waste water to be discharged into the ground over a given area of land (no large laundromats, restaurants, or other generators of substantial flows) without possible pretreatment of the sewage or waste water before discharge to a leaching system.

4. Increase the separating distances and keep the leaching area as elevated as possible above the underlying ground water table.

With development comes increased surface drainage runoff which can also cause deterioration to surface water. No doubt, measures for providing controlled release of storm water and/or preventing erosion and sedimentation problems should be included and monitored closely.

VIII. WATER SUPPLY

Public water supply lines are not presently available to the study areas. Bedrock, at least in the western half of the property appears to be the principal source of water to potential developments. Bedrock is commonly capable of supplying small but reliable yields of ground water to individual wells. Ground water moves through bedrock by way of an interconnected fracture system. Most wells that penetrate 150 to 200 feet of bedrock will intersect enough fractures to supply at least 2 or 3 gallons per minute. Some wells, however, fail to intersect any waterbearing fractures. It is very difficult even with fancy geophysical equipment to predict whether any particular location will be good for drilling a well.

Very few wells in bedrock can be expected to yield 20 gallons or more per minute. It should be pointed out that there are some high producing bedrock wells (greater than 20 gallons) in the state. Examples of these would be the carbonate bedrock in northwestern Connecticut, the sedimentary bedrock in the Central Valley, and wells tapping highly fractured bedrock overlain by thick, coarse-grained sand and gravel deposits, which are saturated by at least 10 feet.

If the total daily demand for water is only 1000-2000 gallons for a prospective commercial use, a relatively low-yield well can adequately serve this need. Storage capacity will usually be needed to allow the flow rate from the system to exceed the actual rate of return flow from the ground into the wells. The well shaft will provide some of this storage, but tanks may be needed for some uses.

According to the "Groundwater Availability in Connecticut" map, by Daniel B. Meade, the stratified drift deposits on the site have potential for small to moderate yielding wells (1-100 gallons per minute). The actual potential of the sand and gravel deposits in the study are presently unknown. Hydrogeologic studies of the area as well as drilling on exploratory well(s) would need to

be conducted in order to determine its potential. As mentioned earlier, the area within the HC Zone which is east of Route 216, to the Ashaway lies within the Town's Aquifer Protection Zone. Therefore, any future developments in this area would need to comply with the Town's regulations pertaining to Aquifer Protection (see Section 406 Aquifer Protection Overlay Area of the Town's Zoning Regulations). A commission member questioned on the review day whether or not the list in Section 406 regarding permitted uses should be expanded. In this regard, it is recommended that town officials contact Jim Murphy, Principal Environmental Analyst, Department of Environmental Protection's Water Compliance Section at 566-3496. The Town may also consider reviewing some recently adopted aquifer protection ordinances for other towns in the State.

A well or wells should be located at a relatively high point on a site and conservatively separated from sewage disposal systems and protected from surface runoff which may contain such contaminants as automobile residue, hydrocarbons, and/or road salt. The well or wells should be tightly sealed into the underlying bedrock as well as properly grouted. This should minimize the chances of well contamination.

Water wells designed for more than two connections would be classified as a public water supply and the necessary approval for any well locations would have to be obtained from the State Department of Health Services, Public Water Supply Section. It is recommended they be contacted as soon as possible to discuss the proposal. Water quality, yield, along with plans for pumpage storage and distribution would need to be reviewed and approved by the Public Water Supply Section.

Land use can change the ability of an aquifer to supply water. If impermeable surfaces such as parking areas and rooftops on large buildings cover a portion of an aquifer's primary and secondary (upland) recharge areas, and the runoff from those surfaces flows overland to nearby streams or the Ashaway River instead of recharging the groundwater, the zone of influence for a pumping well will have to expand to compensate for the lost groundwater recharge. As a result, land area formerly outside the area of influence will become the primary recharge areas for the well, if they can absorb precipitation. If there is no porous, permeable land within reach of the pumping well that can provide the recharge needed, the yield of a potential or existing well and the ability of the aquifer to provide water may be diminished. In this regard, the Town should consider limiting the amount of impervious surfaces created on a particular site so that it does not affect the aquifer, especially if the aquifer is an important one.

The neutral quality of the ground water would be expected to be generally good. The bedrock that underlies the site contains elevated levels of iron-bearing minerals, some undesirably high concentrations of iron or manganese may occur in well water drawn from the area, but there are several types of filters available to combat this problem.

IX. SOILS

This soils section includes a soil map, a soil limitations chart for small commercial buildings, local roads and streets, and sanitary facilities. A description of the soils is included in the Appendix.

The soil recommendations are as follows:

1. Storm water management (zero increased runoff) should be incorporated into any plans for the area.

2. Sediment and Erosion Control Plans should be prepared and implemented for any proposal.

If you have any questions, please contact the New London County Soil and Water Conservation District, 887-4163.

X. PLANNING COMMENTS

The Southeastern Connecticut Regional Planning Agency prepared a study for the North Stonington Planning and Zoning Commission entitled, "Land Use and Traffic in the Highway Commercial Zoning District." This report was completed in September 1985. The study's primary focus is on development potential, land use, traffic and accidents. This document should be consulted for information pertaining to those concerns.

Based on the field review, and comments made about land ownership and expansion of existing uses, further elaboration is warranted in the Traffic section of the SECRPA report. The following information should be added to page 18, after paragraph 1 in the report:

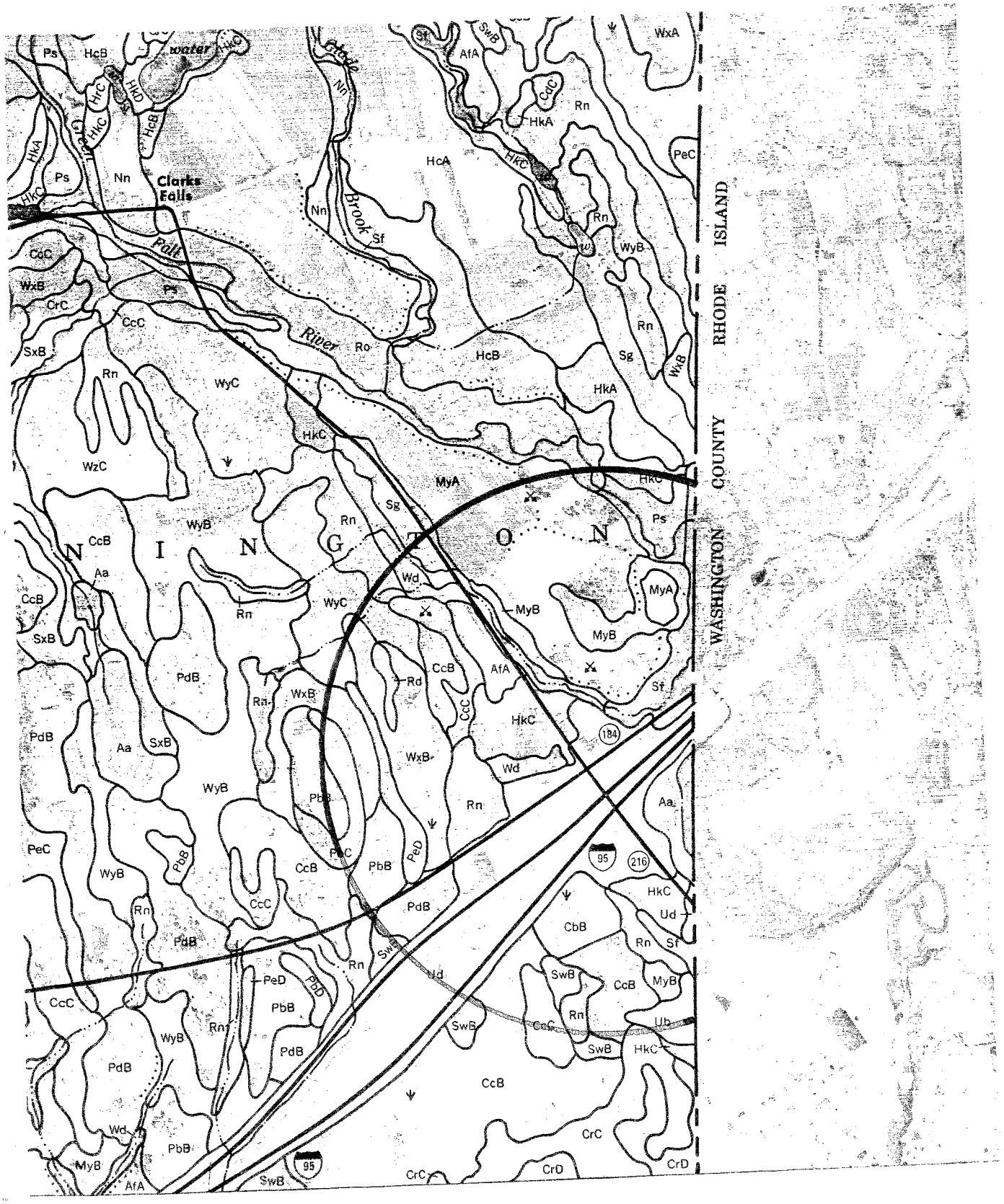
> Should the existing residential uses on the easterly side of Route 216 be proposed for commercial use, it would be desirable to achieve at least an exit driveway through this area from the truck parking area at the rear of Republic Plaza directly to Route 216. This would provide trucks leaving the Plaza and headed for I-95 with an alternative to the left-turn movement through the Routes 626/184/216 intersection. By exiting the parking area onto the more lightly traveled Route 216 northerly of the intersection, the trucks would have an easier time passing through the busy intersection without having to make a turning movement.

United States Department of Agriculture

Soil Conservation Service

New London County S&WCD
562 New London Turnpike
Norwich, CT 06360
887-4163

SURVEY SHEET #58 SCALE 1" = 1320'



ERT REPORT - 9/23/85
PROPOSED COMMERCIAL DEVELOPMENT, N. STONINGTON, CT.

Soils descriptions & Limitations

Soil Symbol	Soil name	BUILDING SITE DEVELOPMENT		SANITARY FACILITIES	
		Small commercial Buildings	Local Roads & Sts.	Septic Tank Absorption Fields	Sewage Lagoon Areas
Aa*	Adrian	Severe: ponding, low strength	Severe: ponding, low strength, frost action	Severe: ponding poor filter	Severe: seepage ponding, excess humus
CbB*	Canton	Moderate: slope	Slight	Slight	Severe: seepage
	Charlton	Moderate: slope	Slight	Slight	Severe: seepage
CcC*	Canton	Severe: slope	Moderate: slope	Moderate: slope	Severe: slope, seepage
HkC	Hinckley	Severe: slope	Moderate: slope, large stones	Severe: poor filter	Severe: slope, seepage
MyA	Merrimac	Slight	Slight	Severe: poor filter	Severe: seepage
MyB	Merrimac	Slight	Slight	Severe: poor filter	Severe: seepage
PbB*	Montauk	Moderate: wetness, slope	Moderate	Severe: percs slowly	Moderate: slope
PdB*	Paxton	Moderate: slope wetness	Moderate: frost action, wetness	Severe: percs slowly	Moderate: slope
	Montauk	Moderate: wetness slope	Moderate: wetness frost action	Severe: percs slowly	Moderate: slope
PeD*	Paxton	Severe: slope	Severe: slope	Severe: slope percs slowly	Severe: slope
	Montauk	Severe: slope	Severe: slope	Severe: percs slowly, slope	Severe: slope

ERT REPORT - 9/23/85
PROPOSED COMMERCIAL DEVELOPMENT, N. STONINGTON, CT.

Soils descriptions & Limitations

Soil Symbol	Soil name	BUILDING SITE DEVELOPMENT		SANITARY FACILITIES	
		Small commercial Buildings	Local Roads & Sts.	Septic Tank Absorption Fields	Sewage Lagoon Areas
Rn*	Ridgebury	Severe: wetness	Severe: wetness, frost action	Severe: percs slowly, wetness	Slight
	Leicester	Severe: wetness	Severe: wetness, frost action	Severe: wetness	Severe: seepage wetness
	Whitman	Severe: ponding	Severe: frost action, ponding	Severe: percs slowly, ponding	Slight
Sf	Scarboro	Severe: ponding	Severe: ponding, frost action	Severe: ponding poor filter	Severe: seepage excess humus, ponding
SwB	Sutton	Moderate: slope wetness	Moderate: frost action, wetness	Severe: wetness	Severe: wetness seepage
WxB	Woodbridge	Moderate: slope, Wetness	Severe: frost action	Severe: percs slowly, wetness	Moderate: slope

* = See description of the map unit for composition and behavior characteristics.

XII. SUMMARY

NOTE: This is a very brief summary of the major points, concerns and recommendations of the Team. You are strongly urged to read the entire report, and to refer back to the specific sections in order to obtain all the information about a certain topic.

TOPOGRAPHY - The study area is characterized by slopes which range from moderate to fairly flat. Drainage in the area has been altered considerably by the construction of construction if I-95.

GEOLOGY - The bedrock geology and the surficial geology have been mapped and published by the U.S. Geological Survey, and is available for review at DEP's Natural Resources Center in Hartford.

GEOLOGIC DEVELOPMENT CONCERNS - From a geologic standpoint, it appears that portions of the NW and SW quadrants (see Quadrant Location Map) are moderately well suited for development. The SE quadrant is almost entirely wetland soils and lies within the flood prone area of the Ashaway River, because of this it is not suitable for any type of development. Most of the NE quadrant has been developed already. The NE and NW quadrants are within the Town's Aquifer Protection Zone.

Careful consideration must be given to the site's ability to handle on-site subsurface sewage disposal because of the till base soils, stratified drift and inland-wetland soils. All potential highway commercial uses should require engineered design plans for sewage disposal.

The Town should consider having all prospective developers in the Highway Commercial Zone submit plans which have the inland-wetland boundaries superimposed on the plan. The inland-wetland soils should be flagged by a competent certified soil scientist.

FLOOD HAZARD AREAS - The '100' year flood boundary parallels the Ashaway River in the eastern parts of the study area, and it also extends along a tributary to Ashaway River in the eastern parts of the study area. The '500' year flood boundary fringes the outer limits of the '100' year flood boundary on the west side of the river.

HYDROLOGY - It is suggested that the Town require each prospective developer to submit detailed hydrological information with their development plans. This should include pre- and post-development runoff estimates from a particular site for the 10, 25, 50 and 100 year storm events.

All down stream culverts should be examined.

In some cases, it may be necessary for a developer to maintain post-development runoff flows from a site at present levels.

AQUIFER PROTECTION - When considering potential applications for commercial uses in a designated aquifer area, have an applicant submit a report regarding the amount and composition of the particular waste(s) to be generated.

It may be necessary to prohibit commercial activities that use hazardous materials. Certainly such wastes must be disposed of in accordance with the requirements and standards established by the Department of Environmental Protection.

Limit the volume of sewage or waste water to be discharged into the ground over a given area of land (no large laundromats, restaurants, or other generators of substantial flows) without possible pretreatment of the sewage or waste water before discharge to a leaching system.

Increase the separating distances and keep the leaching area as elevated as possible above the underlying ground water table.

WATER SUPPLY - In the western half of the study area, bedrock appears to be the principal source of water for developments.

The stratified drift deposits on the site have the potential for small to moderate yielding wells.

The actual potential of the sand and gravel deposits are presently unknown.

Development which occurs within the Town's Aquifer Protection Zone will need to comply with regulations pertaining to aquifer protection.

DEP's Water Compliance Section should be contacted for information concerning the expansion of Section 406 (permitted uses) of the Town's regulations.

The Town may also wish to review some recently adopted aquifer ordinances for other towns in the state.

The Public Water Supply Section of the Department of Health Services must be contacted for review and approval of all water wells designed for more than two connections.

The Town should consider limiting the amount of impervious surfaces created on a particular site so that it does not affect the aquifer, especially if the aquifer is an important one.

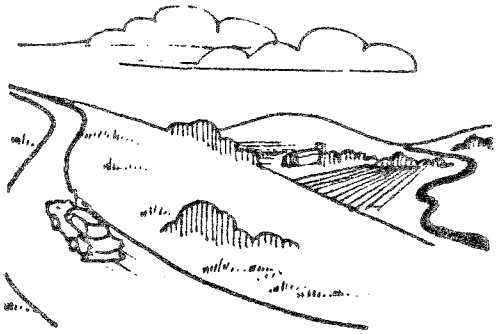
The natural quality of the ground water would be expected to be generally good.

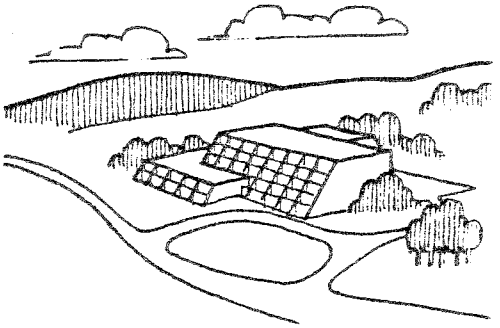
SOILS - Stormwater management (zero increased runoff) should be incorporated into any plans for this area.

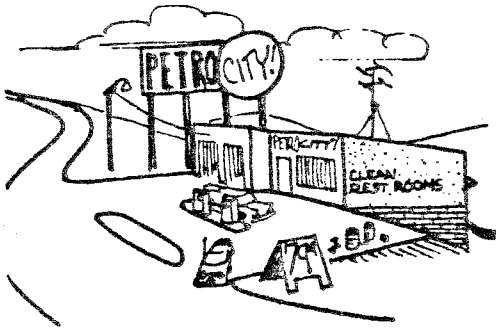
Sediment and Erosion Control Plans should be prepared and implemented for any proposal.

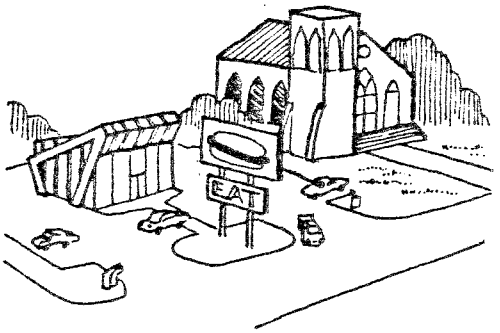
PLANNING COMMENTS - Should the existing residential uses on the easterly side of Route 216 be proposed for commercial use, it would be desirable to have an exit driveway through this area from the truck parking area to Route 216. Trucks would have an easier time passing through the intersection without having to make a turning movement.

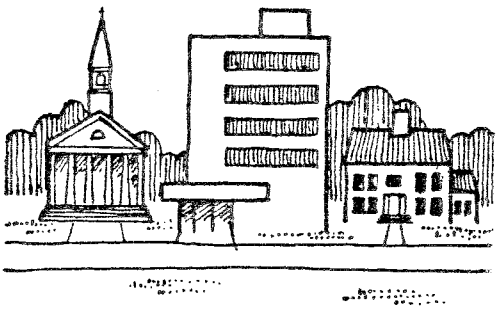
Please refer to the report, "Land Use and Traffic in the Highway Commercial Zoning District," prepared by the Southeastern Connecticut Regional Planning Agency, September 1985 for further information concerning planning, land use, and traffic.






PETRO CITY
CLEAN REST ROOMS


EAT



Appendix

Aa-Adrian and Palms mucks

These nearly level, very poorly drained soils are in pockets and depressions of stream terraces, outwash plains, and glacial till uplands. Slopes range from 0 to 2 percent. Mapped areas consist of either Adrian soils or Palms soils, or both. These soils were mapped together because there are no major differences in most uses and management. Adrian soils have a high water table which is at or near the surface for most of the year. Permeability is moderately rapid in the organic layers and rapid in the substratum. The available water capicity is high. Runoff is very slow or ponded. Adrian soils are stronly acid through slightly acid. Palms soils have a high water table which is at or near the surface for most of the year. Permeability is moderately rapid in the organic layers and moderately slow in the substatum. The available water capacity is high. Runoff is very slow or ponded. Palms soils are strongly acid through slightly acid.

CbB-Canton and Charlton fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on glacial till upland hills, plains, and ridges. Areas of this unit consist of either Canton soil or Charlton soil, or both. These soils were mapped together because there are no major differences in use and management. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is medium. This soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium. The soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

These soils are well suited to cultivated crops. These soils are in capability subclass IIe.

CcC-Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes

These sloping, well drained soils are on glacial till upland hills, plains, and ridges. Stones and boulders cover 1 to 8 percent of the surface. These soils were mapped together because there are no major differences in use and management. Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is rapid. The soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

HkC-Hinckley gravelly sandy loam, 3 to 15 percent slopes

This gently sloping and sloping, excessively drained soil is on stream terraces, outwash plains, kames, and eskers. Permeability of the Hinckley soil is rapid in the surface layer and subsoil and very rapid in the substratum. The available water capacity is low. Runoff is medium or rapid. Hinckley soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid. This soil is suited to cultivated crops. Hinckley soil is droughty, and irrigation is needed. The hazard of erosion is moderate or severe. This soil is in capability subclass IVs.

MyA-Merrimac sandy loam, 0 to 3 percent slopes

This nearly level, somewhat excessively drained soil is on stream terraces and outwash plains. Permeability of the Merrimac soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is slow. Merrimac soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid. This soil is well suited to cultivated crops. It is droughty during the drier periods in summer. This soil is capability subclass IIs.

MyB-Merrimac sandy loam, 3 to 8 percent slopes

This gently sloping, somewhat excessively drained soil is on stream terraces, outwash plains, kames, and eskers. Permeability of the Merrimac soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is medium. Merrimac soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid. This soil is well suited to cultivated crops. It is droughty during the drier periods in summer. This soil is in capability subclass IIs.

PbB-Paxton and Montauk fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on drumloidal, galcial till, upland landforms. These soils were mapped together because there are no major differences in their use and management. Permeability of the Paxton soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium. The Paxton soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

Permeability of the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. The available water capacity is moderate. Runoff is medium. The Montauk soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

These soils are well suited to cultivated crops. These soils are in capability subclass IIe.

PdB-Paxton and Montauk very stony fine sandy loams, 3 to 8 percent slopes

These gently sloping, well drained soils are on drumloidal, glacial till, upland landforms. Stones and boulders cover 1 to 8 percent of the surface. These soils were mapped together because there are no major differences in use and management. Permeability of the Paxton soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium. Paxton soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

Permeability of the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. The available water capacity is moderate. Runoff is medium. Montauk soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

These soils are not suited to cultivated crops because stoniness makes the use of farming equipment difficult. These soils are in capability subclass VIs.

SwB-Sutton very stony fine sandy loam, 0 to 8 percent slopes

This nearly level to gently sloping, moderately well drained soil is on upland glacial till plains, hills, and ridges. Stones and boulders cover 1 to 8 percent of the surface. The Sutton soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is slow or medium. Sutton soil warms up and dries out slowly in the spring. It is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum. This soil is not suited to cultivated crops. Stones and boulders make the use of farming equipment difficult. This soil is in capability subclass VIs.

PeD-Paxton and Montauk extremely stony fine sandy loams, 15 to 35 percent slopes

These moderately steep to steep, well drained soils are on drumloidal, glacial till, upland landforms. Stones and boulders cover 8 to 25 percent of the surface. These soils were mapped together because there are no major differences in use and management. Permeability of the Paxton soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very rapid. Paxton soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

Permeability of the Montauk soil is moderate or moderately rapid in the surface layer and subsoil and slow or moderately slow in the substratum. The available water capacity is moderate. Runoff is very rapid. Montauk soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

These soils are not suited to cultivated crops. Stoniness makes the use of farming equipment impractical. The hazard of erosion is severe. These soils are in capability subclass VIIs.

Sf-Scarboro mucky fine sandy loam

This nearly level, very poorly drained soil is on stream terraces and outwash plains. Slopes range from 0 to 3 percent. The Scarboro soil has a high water table at or near the surface for most of the year. Permeability is rapid in the organic layer and rapid or very rapid in the mineral surface layer and substratum. The availabe water capacity is low. Runoff is very slow, or the soil is ponded. Scarboro soil is very strongly acid through medium acid. This soil is not cultivated crops because of wetness. This soil is in capability subclass Vw.

Rn-Ridgebury, Leicester, and Whitman extremely stony fine sandy loams

These nearly level, poorly drained and very poorly drained soils are in drainageways and depressions of glacial till upland hills, ridges, plains, and drumloidal landforms. Stones and boulders cover 8 to 25 percent of the surface. These soils were mapped together because there are no major differences in use and management. The Ridgebury soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow or slow. Ridgebury soil warms up and dries out slowly in the spring. It is strongly acid through slightly acid.

The Leicester soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is very slow or slow. Leicester soil warms up and dries out slowly in the spring. It is very strongly acid through medium acid.

The Whitman soil has a high water table at or near the surface for most of the year. Permeability is moderate or moderately rapid in the surfacelayer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow, or the soil is ponded. Whitman soil warms up and dries out very slowly. It is very strongly acid through slightly acid.

These soils are not suited to cultivated crops. Stoniness makes the use of farming equipment impractical. These soils are in capability subclass VIIs.

WxB-Woodbridge fine sandy loam, 3 to 8 percent slopes

This gently sloping, moderately well drained soil is on drumloidal, galcial till, upland landforms. The Woodbridge soil has a seasonal high water table at a depth of about 18 inches. It has moderate permeability in the surface layer and subsoil and slow or very slow permeability in the substratum. The available water capacity is moderate. Runoff is medium. This soil warms up and dries out slowly in the spring. Unless limed, it is strongly acid or medium acid in the surface layer and subsoil and strongly acid thorough slightly acid in the substratum. This soil is well suited to cultivated crops. This soil is in capability subclass IIw.

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--an 86 town 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 activities. 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, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. 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 Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.