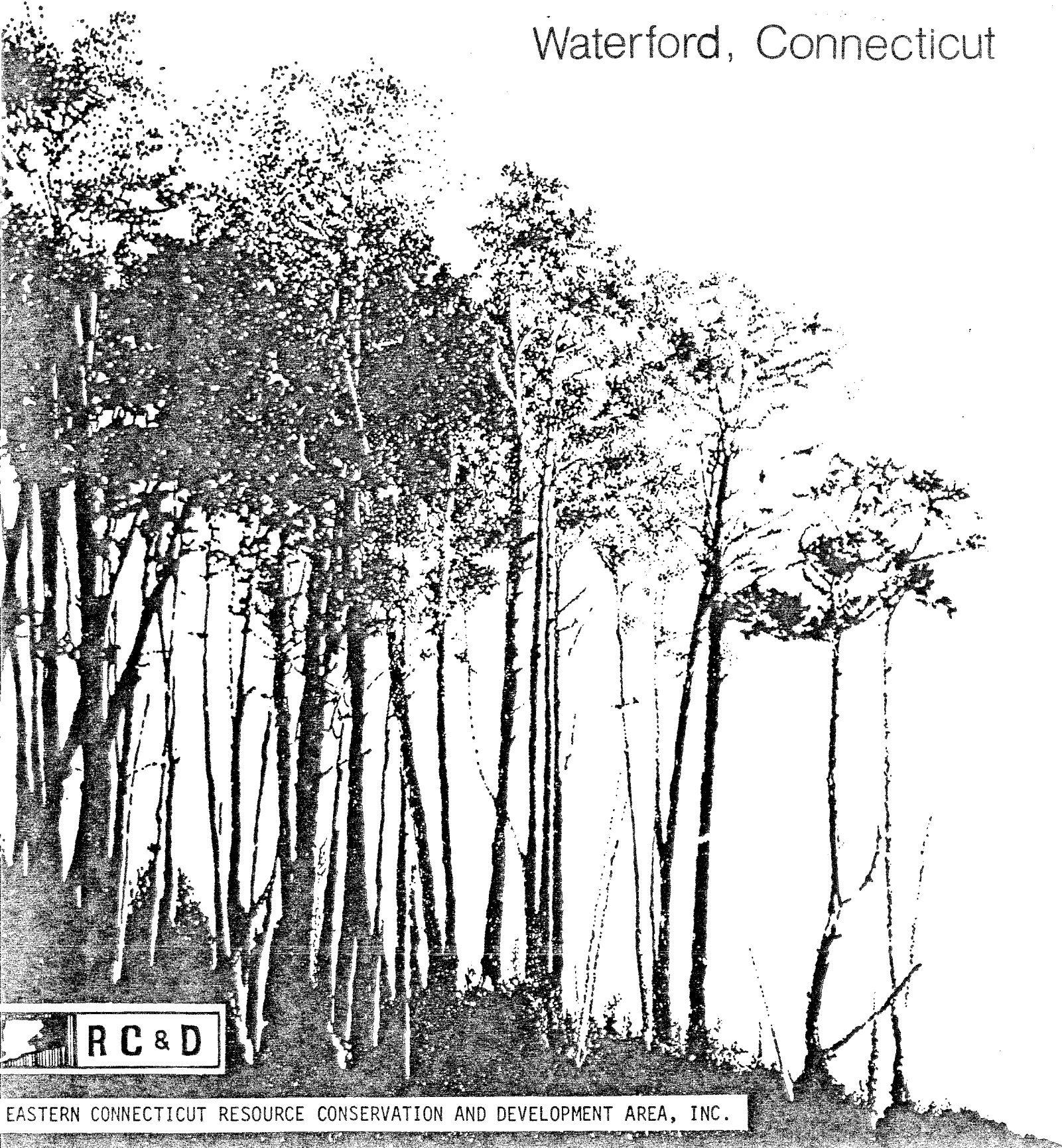


Environmental Review Team Report

Recreation Development

Waterford, Connecticut

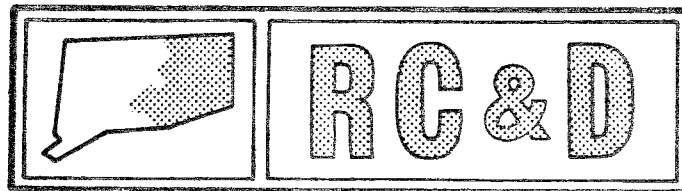


EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team
Report

Recreation Development
Waterford, Connecticut

September 1983

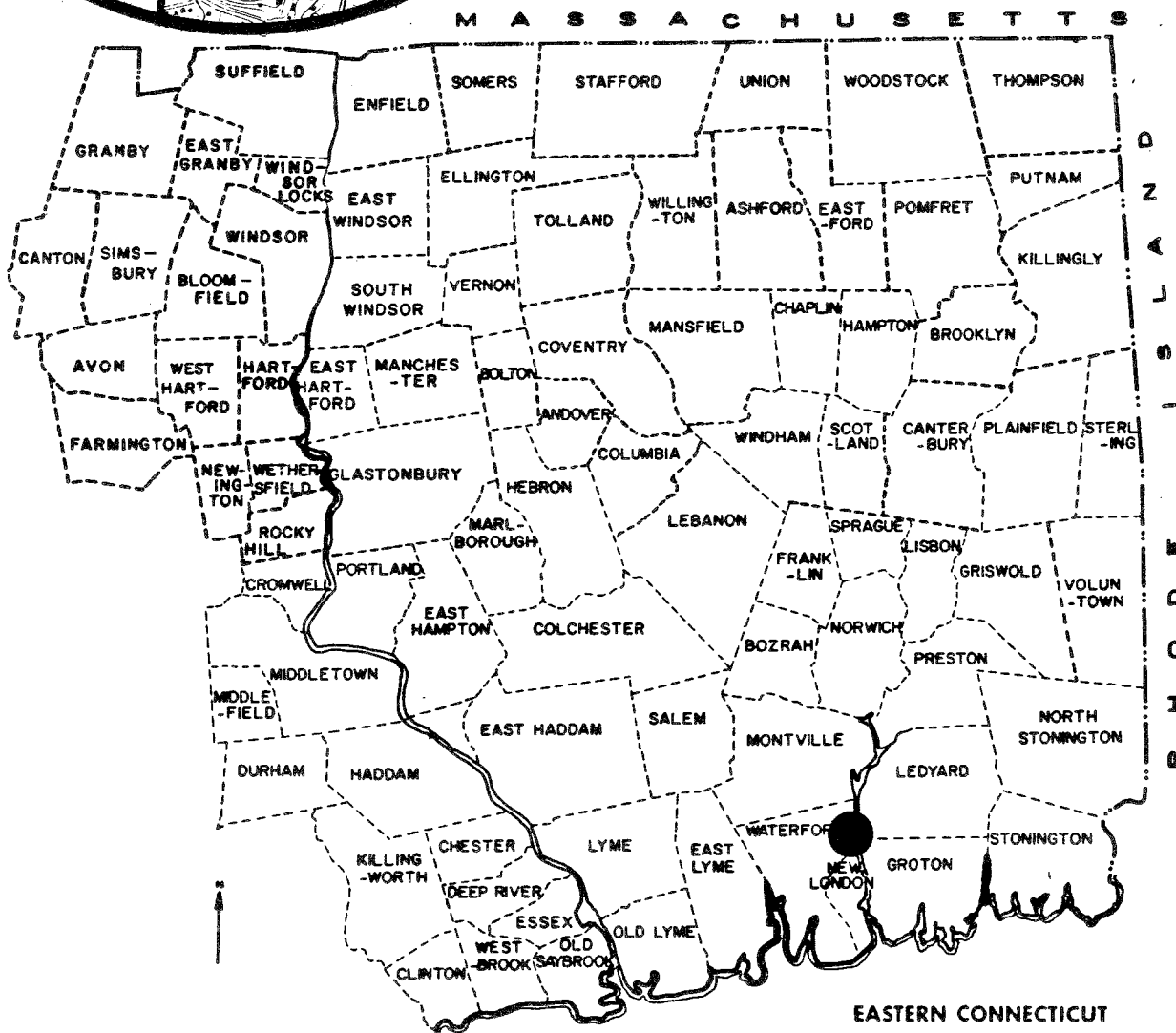
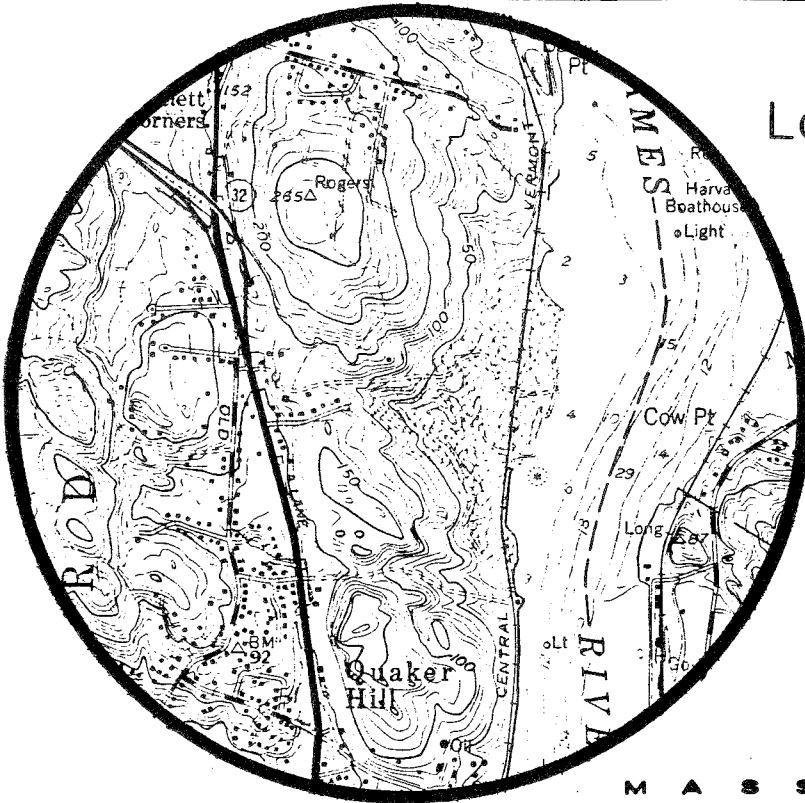


Eastern Connecticut Resource Conservation & Development Area

Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234

Location of Study Site

E.B. RECREATION DEVELOPMENT
WATERFORD, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
ELECTRIC BOAT RECREATION AREA
WATERFORD, CONNECTICUT

This report is an outgrowth of a request from the Waterford 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 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: Liz Rodgers, Soil Conservationist, Soil Conservation Service (SCS); Bill Warzecha, Geologist, Department of Environmental Protection (DEP); Pete Merrill, Forester, DEP; Ron Rosza, Ecologist, Coastal Area Management (DEP); Tom Seidel, Regional Planner, Southeastern Connecticut Regional Planning Agency; Dana Pumphrey, Ecologist, Coastal Area Management (DEP); Don Capellaro, Sanitarian, State Department of Health; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Thursday, May 19, 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 the 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 Waterford. 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, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234, 774-1253.

Topography

— Site Boundary

0 660'
scale



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a proposed recreation area in the town of Waterford. The Electric Boat Management Association and Athletic Club is proposing a limited recreational development on a 220+ acre parcel located between Route 32 and the Thames River. The project has been divided into phases and the Team reviewed the Phase I site, approximately 12.5 acres, in detail. The Town Plan of Development recommends this total parcel for natural resource, waterfront recreation and industrial uses.

The Electric Boat Management Association has no formal plans prepared for this site at present. A schematic plan for another General Dynamics recreation facility was shown to the Team prior to review of the site, as the type of facility that the Management Association would like to have in the future. The Phase I development proposed for the study parcel would include construction of a baseball/softball field, installation of a septic system, construction of a dock for use by small boats and improvement to the access road into the property. An activity building and meeting room is planned for Phase II of the development.

The Team is concerned with the effect of this proposed development on the natural resource base of this site. Although severe limitations to development can be overcome with proper engineering techniques, these measures are often costly and can make a project financially unfeasible. The relationship of cost factors to environmental limitations should be recognized and evaluated by the developer when possible prior to preparation of final plans.

Although this site has a varied terrain and fragile coastal area, if developed as proposed in the areas indicated to the Team at the field inspection, there do not seem to be many major limitations to development. Team concerns and possible mitigating measures are discussed in detail in the following sections of this report.

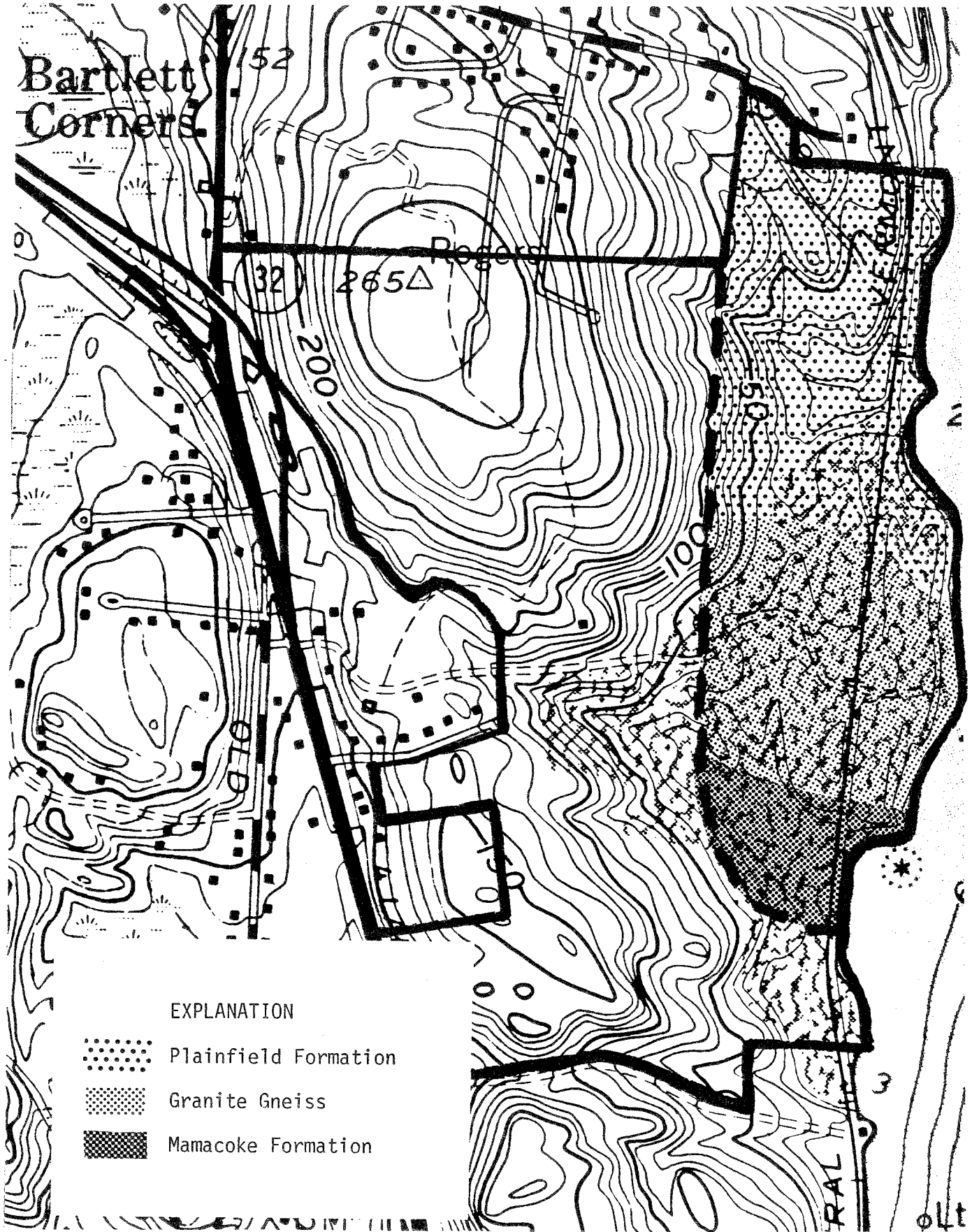
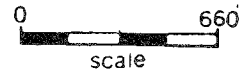
ENVIRONMENTAL ASSESSMENT

GEOLOGY

Although the entire parcel is comprised of +220 acres, the Team concentrated their attention on Phase I of the proposed recreational project. This portion of the site, which is located in the eastern section of the parcel, is situated on a terrace bordering the Thames River. The Phase I area which is 12.5 acres in size has a topography that consists primarily of a fairly flat, glacial outwash deposit. It appears the surface has been broken in many areas for sand and gravel extraction purposes. From this relatively flat, terraced area, the land rises moderately to a bedrock controlled hill in the northern section of the parcel. Access to the site may be by a dirt road off of Upper Bartlett Road which is at the north boundary of the parcel or by a right-of-way off of Route 32 in the western section. Land surface elevations on the parcel range from mean sea level (0) along the Thames River to 265 feet above mean sea level at the peak of the hill in the northern section of the parcel. Steepest slopes, which range between 20% and 25% are found throughout the central and northern portions of the parcel.

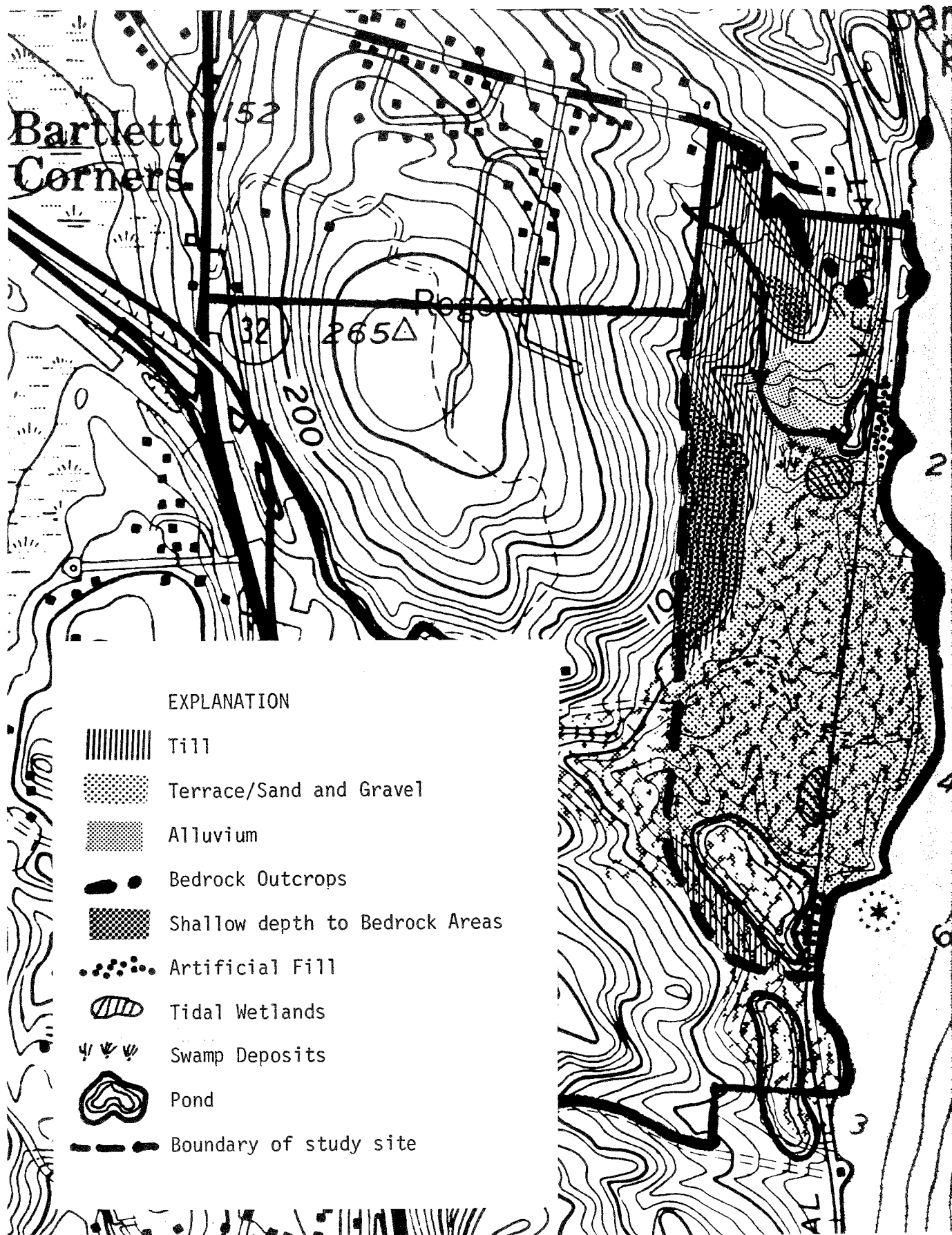
Elevations for the parcel were taken from the Uncasville topographic quadrangle map published by the U.S. Geological Survey (U.S.G.S.).

Bedrock Geology



Surficial Geology

0 660
scale



Both the surficial and bedrock geologic maps of the Uncasville quadrangle were prepared by Richard Goldsmith and published by USGS. (Maps GQ-138 and GQ-576 respectively).

Scattered bedrock outcrops were observed in the Phase I area primarily along the banks of the Thames River as well as throughout the northern section of the site. Most of the bedrock that underlies or crops out within this site is gneissic. Gneisses are a crystalline, metamorphic (i.e., heat-altered) rocks that formed as a result of intense pressure and heat to which the rocks were subjected when they formed deep within the earth's crust. They are rocks characterized by banding which occurs as a result of thin bands of platy, flaky or elongate minerals alternating with layers of more granular minerals. An accompanying bedrock geologic map adapted from Map GQ-576 shows the approximate distribution of various rock types and also provides a further description of the particular rock. It should be noted that some of the rocks, particularly the granitic gneiss, have been quarried for rip-rap or building stone in the area.

Bedrock throughout the Phase I area is overlain mainly by unconsolidated materials which are mostly of glacial origin. The most widespread surficial (overlying bedrock) material are terrace deposits which consist of sand and gravel. These sediments were deposited by meltwater streams emanating from the wasting ice which carried tremendous volumes of rock materials that had formerly been incorporated in the glacier. The meltwater streams sorted the materials to some extent and deposited them in layers. The thickness of these deposits is probably +10 feet and may be less where the materials have been extracted in the past.

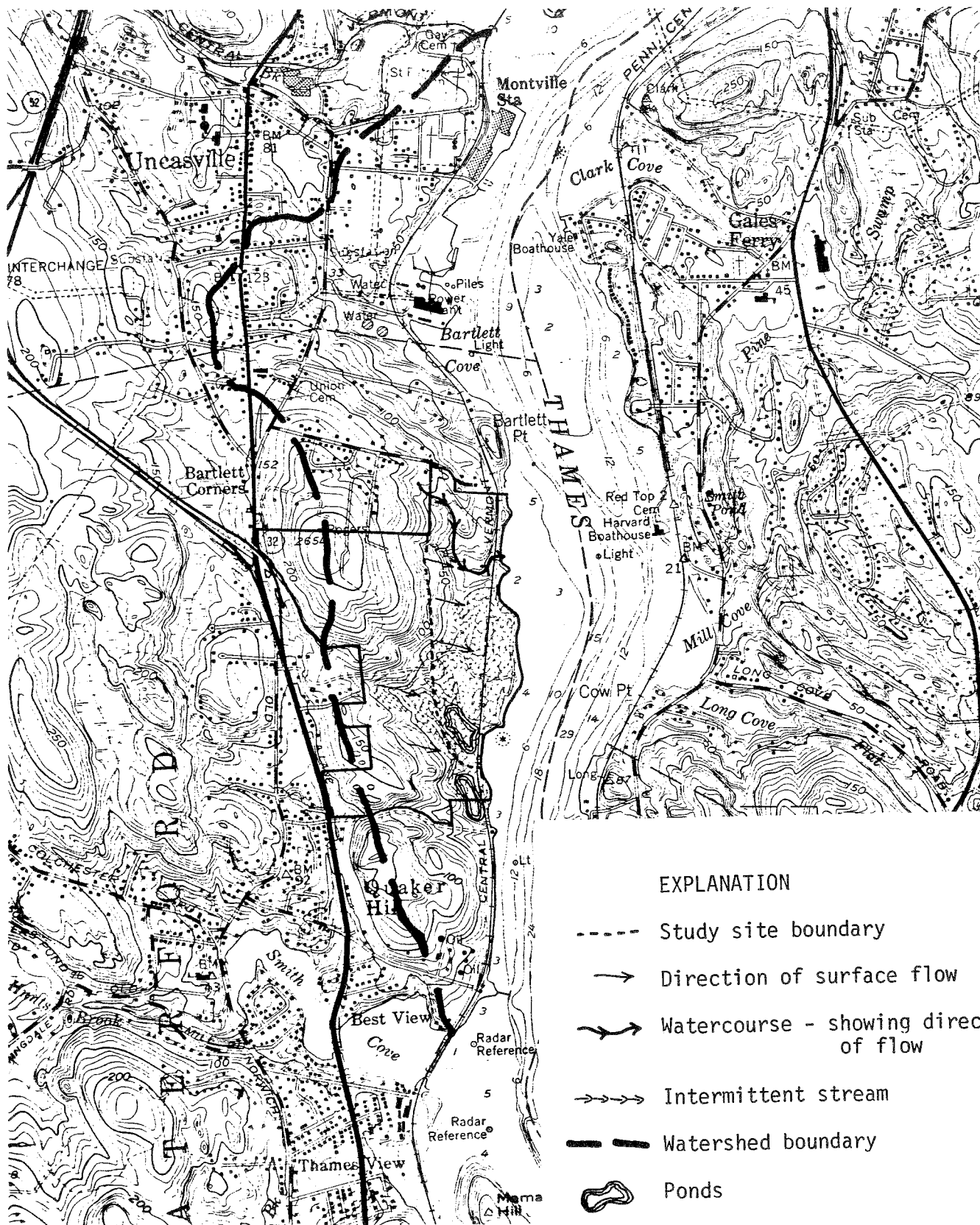
Another glacial sediment found in the Phase I area is till, which is restricted to the northern section of the study site. Till is composed of rock particles ranging in size from clay to boulders that was deposited directly from the glacier. Because the glacier indiscriminately collected, transported, crushed, abraded and deposited rock fragments, the till, unlike the terrace deposits mentioned earlier show little or no sorting or stratification. Till varies in texture from place to place, in which case, it may be sandy or silty, compact or loose, stony or not stony. Depth of the till deposits are probably quite shallow throughout the site, less than 10 feet. The accompanying surficial geologic map as adapted from Map GQ-138 shows the approximate distribution of the terrace and till deposits. It also shows several more recent deposits which include artificial fill, alluvium, swamp deposit. "Artificial fill" on the site consists of earth materials that were placed during the construction of the railroad bridge crossing. Recent alluvium is defined as silt, sand and gravel deposited by the unnamed brook in the northern section of the site. "Swamp deposits" consist of partly decomposed organic material mixed or interbedded with much silt, sand and clay. They were formed when the sediments settled to the bottom of a sluggish or stagnant body of water. Thickness of the swamp deposits are probably less than 3 feet and are underlain by sand and gravel.

HYDROLOGY

One small, unnamed stream emanating from the northern section of the site flows in a southerly direction then eastward and finally empties into a small pond in the eastern section of the property. The pond outlets through a culvert under the railroad tracks into the Thames River. A small, intermittent watercourse in the western section converges with the stream mentioned previously in the central section of the site. Drainage from the surface of the site flows generally in an

Drainage Areas

0 2000'
SCALE






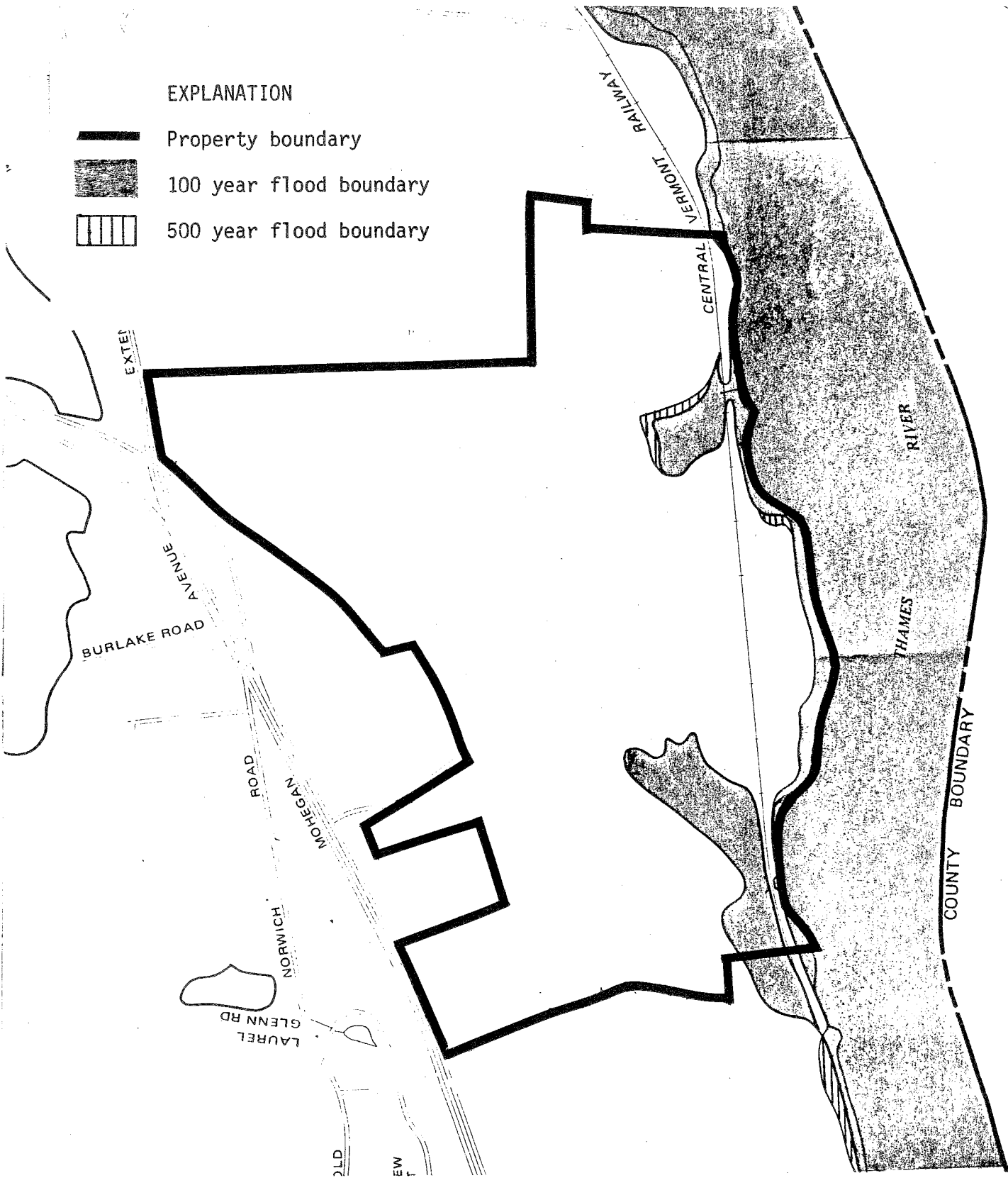
Floodprone Areas

0 1000'
scale



EXPLANATION

-  Property boundary
-  100 year flood boundary
-  500 year flood boundary



eastward direction most of which passes through tidal wetlands before emptying into the Thames River.

Runoff from the site will be greater following recreational development; however, these increases should be relatively small. Based on present plans, increased runoff would be created primarily by the impermeable surfaces associated with the proposed shelter building. Parking areas and access roads will be gravel packed. Should the company decide to develop other sections of the parcel or perhaps paved roads and parking areas, it is recommended that potential runoff and erosion problems be addressed prior to development.

The floodprone areas bordering the Thames River have been identified in a map prepared by the Federal Emergency Management Agency. A reproduction of part of that map, which identifies the approximate boundaries for a 100 and 500 year flood is included in this report. A "100" year flood is a flood with a 1% chance of occurring in any given year. A "500" year flood has only one chance in 500 of occurring in any given year.

SOILS

A detailed soils map of this site and detailed soils descriptions are included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320'/inch scale to 660'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitation chart indicates the probable limitations of 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 consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication, New London County Interim Soil Survey Report, 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 are distributed as indicated by the soil map found in the Appendix to this report. They are:

- 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
- HkC - Hinckley gravelly sandy loam, 3 to 15 percent slopes
- NgB - Narragansett very stony silt loam, 3 to 8 percent slopes
- NlC - Narragansett very stony silt loam, 3 to 8 percent slopes
- PbC - Paxton and Montauk fine sandy loams, 8 to 15 percent slopes
- PdB - Paxton and Montauk very stony fine sandy loams, 3 to 8 percent slopes
- Rn - Ridgebury, Leicester, and Whitman extremely stony fine sandy loams
- Wh - Westbrook mucky peat, low salt
- Ub - Udorthents-pits complex, gravelly

Charlton and Hollis soils are mapped together as a complex because they are difficult to separate on the landscape. The Charlton soil consists of very deep,

well-drained loamy soils formed in friable or firm glacial till on uplands. Permeability of the Charlton soils is moderate or moderately rapid throughout.

Hollis soils are shallow to bedrock, loamy and somewhat excessively drained. They are generally on the higher part of the landscape and on the steep side slopes. Bedrock is within 20 inches of the surface and the available water capacity is low or very low. Permeability is moderate or moderately rapid throughout. Surface runoff is rapid.

Hinckley soils are excessively drained sandy and gravelly soils on terraces. These soils are gently sloping to sloping. The water table is commonly below six feet. Permeability is rapid in the surface layer and subsoil, and very rapid in the substratum. These soils have a low available water capacity. Surface runoff is slow.

Narragansett soils are well drained soils on uplands. They have moderate permeability in the surface layer and subsoil, and moderately rapid or rapid permeability in the substratum.

The Paxton and Montauk soils are well drained soils on drumlins, and rounded or elongated hills of uplands. These soils have moderate permeability in the surface layer and subsoil, and slow permeability in the substratum (fragipan).

Ridgebury, Leicester, and Whitman soils are nearly level poorly drained soils on uplands. The Ridgebury and Whitman soils have moderate to moderately rapid permeability in the surface layer and subsoil, slow or very slow permeability in the substratum (fragipan), and a high water table at or near the surface 7 to 9 months of the year. The Leicester soils have moderately rapid permeability and a high water table at or near the surface 7 to 9 months of the year.

Westbrook soils consist of deep, very poorly drained soils formed in organic deposits over loamy mineral material. They are in tidal areas subject to inundation by salt water twice daily.

Udorthents-pits complex, gravelly consists of an active sand and gravel pit with steep banks. The water table is below a depth of six feet. Permeability of the soil materials is rapid or very rapid.

The Ridgebury, Leicester and Whitman complex and the Westbrook series are wetland soils (according to P.A. 155 "Inland Wetlands and Water Courses Regulations of the Environmental Protection"). Permits will be needed before development in this area can take place. Wetland soils should be disturbed as little as possible, both during and after construction; also drainage courses should not be disturbed.

All areas of cut and fill should not have slopes that exceed 2:1. Disturbed areas should be seeded down and hay bales or silt fences will be needed to prevent erosion and sediment deposition. A sediment and erosion control plan should be developed and implemented prior to start of construction on this site. Technical assistance in preparing such a plan is available from the Soil Conservation Service staff at the New London County Soil and Water Conservation District.

VEGETATION

Although this whole parcel contains 220+ acres, only a small portion (12+ acres) will be disturbed with Phase I development.

This can be broken down into three general categories, the first being the northeast corner of the property. This will provide the access road area. There are a number of large black oak, red maples and sugar maples in this area with plantings of conifers such as Douglas fir and Scotch pine. Carefully planned construction could leave most of these trees to provide instant and aesthetically pleasing landscaping.

The second area is the excavated area, where most of the proposed development is to take place. There are areas of unvegetated sand-gravel and other areas where trees and brush are starting to fill in. Primary species include grasses and sedges, Devil's paintbrush, goldenrod, gooseberries, and black berries. Woody shrubs include bayberry, sweet fern, high bush and low bush blueberry, and smooth sumac. Tree species include gray birch, black birch, large-tooth and trembling aspens, scarlet oak, black cherry, cottonwood, and black gum. The trees are all in the seedling and sapling stage. Although there are hardwoods coming into this section of the site, none of them will amount to very much except the cottonwood that is growing along the wet areas. The soils and site are much more suitable to growing conifers such as White pine and/or Austrian pine. Landscaping on this site will generally require the importing of a suitable soil with fertilizer and a moisture holding medium.

The third area is slightly outside the Phase I area but it might be considered for non-intensive recreation such as hiking and/or picnicing. Just west of the excavated area the ground rises into a hardwood forest of black oak and hickory with one very attractive grove of American beech. Vistas from this area look out onto the river.

WATER SUPPLY

In accordance with the establishment of good design and basic sanitary practices the development of a picnic and recreational area should provide for a potable water supply. Its prime use is to be a source of drinking and possible cooking water along with use for restroom facilities incorporating water flush toilets and urinals and hand washing fixtures. Also depending upon the need for personal sanitation and cleanliness after strenuous exercise and the degree of convenience to be provided, the use of water for showering purposes may also be a possible factor.

It is noted that public water from the New London supply has been installed in the general area and that a line is located on Upper Bartlett Road. It would, therefore, appear feasible to have a service line extended into the property from the street main. Having the availability of public water would ensure an adequate and safe water supply.

During the review, company officials questioned the feasibility of installing an on-site well to serve the proposed recreation facility. There does not appear to be a suitable sand and gravel aquifer underlying the site. Therefore, water could be supplied to the site by wells tapping the underlying bedrock. Based on information in Connecticut Resources Bulletin No. 15 (Lower Thames and Southeastern Coastal River Basins), 90% of the bedrock based wells drilled in the basin yielded

at least 3 gallons per minute (gpm). A yield of 3 gpm would probably be adequate for the proposed recreation site. However, because the property is near the Thames River, which is an estuary, it is probable that wells drilled in the area may tap a salty/brackish water containing elevated sodium and chloride levels. If the well was drilled, at a higher elevation in the northwestern section of the site, there would probably be less chance of salty/brackish water intrusion.

WASTE DISPOSAL

Providing adequate sanitary facilities for a recreational project either involves non-water carriage type facilities such as pit privies or chemical toilets or the installation of water flush toilets and other fixtures. The utilization of the latter type fixtures, although not always possible, represents a more desirable and sanitary alternative. In conjunction with the use of water flush fixtures means for the sanitary disposal of sewage waste water must also be provided. Because the area is removed from a public sewer line, an on-site subsurface sewage disposal system would need to be installed. Although considerable portions of the property are poorly suited for sewage disposal due to slope, high ground water or underlying shallow rock, the upper area towards the northeast corner of the property appears to have generally favorable soil conditions and should lend itself for the development of an on-site system. Although this area is within the coastal zone, it has sufficient elevation for protection against possible flooding. However, before a proper system(s) could be presented for the complex it would be necessary to know the number of persons having access to and utilizing the area on a regular or daily basis, and the actual type of sanitary facilities that would be available. Planning the facility should also allow for sufficient on-site testing and evaluation of the land area(s) under consideration for sewage disposal. Engineered design plans should be prepared for review and approval purposes.

Precautions should be taken for the protection of waterways and wetlands by maintenance of proper separating distances and incorporating adequate sediment and erosion control facilities during site work and the construction and/or installation of various facilities.

PLANNING CONCERNS

The Waterford Town Plan recommends this area for waterfront recreation, natural resources, and industrial uses. The natural resources and waterfront recreation categories are located about the periphery of the property with the industrial category in the central portion.

Development of a recreation facility at the northern end of the property would be compatible with this Plan. Enough land exists to adequately buffer these proposed uses from the two homes at the end of Upper Bartlett Road. Access to the site from Upper Bartlett Road could easily be developed since an existing dirt road could be upgraded and widened. Public water is also available to the end of Upper Bartlett Road and could be extended into the site.

The steeply sloping bedrock outcrops at the northern end of the site adjacent to the Thames River could make access to boat slips and docks difficult. Immediately south of these outcrops, the slope is not as steep and it would probably be easier to construct docks or floats, or perhaps even pilings if needed. An analysis would have to be done to determine if any dredging out to the channel would be necessary.

If just small pleasure craft are to use the docking facilities then access depth should be less of a problem.

Access from the recreation facility to the docking area would mean an at-grade crossing over the Central Vermont Railroad tracks or construction of an elevated or subterranean walkway. Approximately two trains per day utilize these tracks. A culvert under these tracks appears to be large enough to house a pedestrian walkway to the small beach area on the eastern side of the property. If the walkway is fenced to restrict access to the tracks, it would probably be a reasonably safe and feasible means of providing access to this beach other than construction of an at-grade crossing or elevated walkway.

COASTAL MANAGEMENT

As presented to the Environmental Review Team, the Electric Boat Management Association and Athletic Club proposes to develop a portion of the Thames River-front site for recreational purposes. Although no formal plans have been prepared at this time, the list of possible activities includes the construction of a baseball/soft-ball field, a dock for use by small boats, and an activity building with a meeting room. All of these possible uses qualify as permitted uses under Waterford's Water-front Development District (See Appendix B.).

Once formal plans are prepared, the applications for zoning permits and coastal site plan review (CSPR) must be submitted to the Town for review and approval. In achieving CSPR approval pursuant to Sections 22a-105 through 22a-109 of the Connecticut General Statutes (the CCMA), the applicant must demonstrate and the municipal commission must find that (1) the proposal is consistent with all applicable coastal management policies, (2) adverse impacts on coastal resources and future water dependent uses are acceptable, and (3) all reasonable measures to mitigate adverse impacts have been incorporated into the project.

Due to the preliminary nature of the proposals for this site the following discussions merely point out the coastal management considerations applicable to this site.

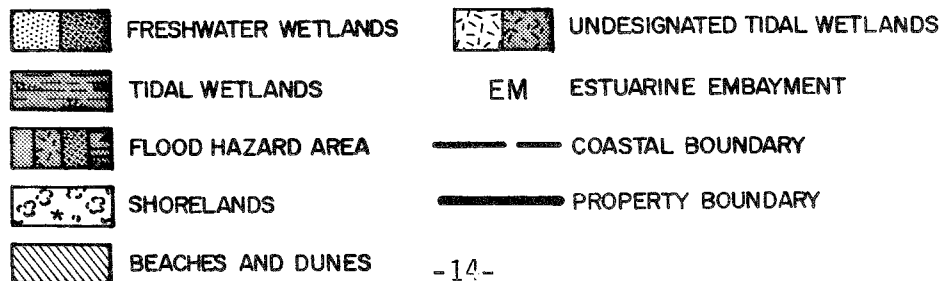
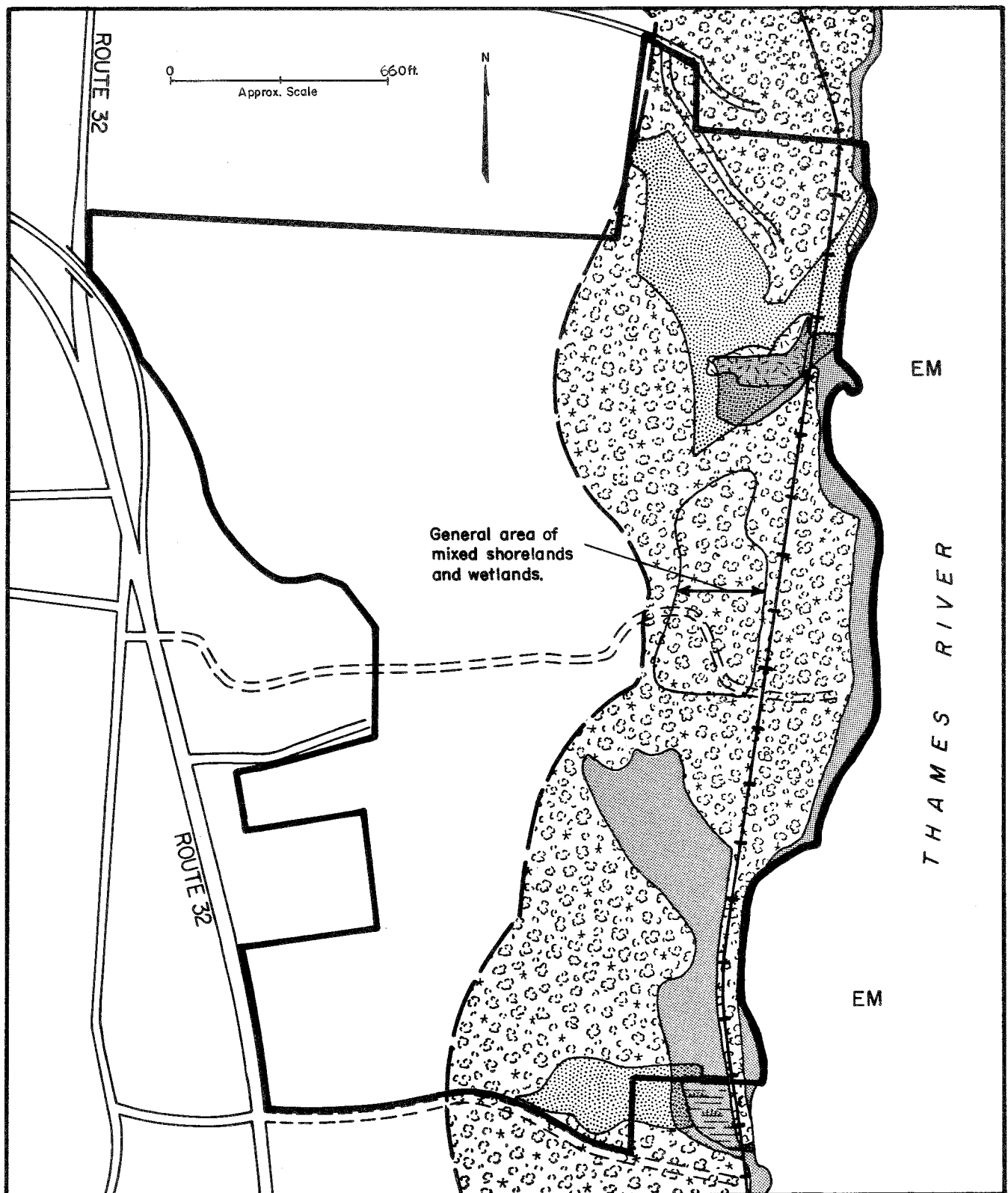
Coastal Resource Identification

As part of the CSPR application, a plan must be submitted depicting the spatial location of coastal resources on and adjacent to the site. As defined in the CCMA, coastal resources located on and adjacent to the site are Shorelands, Coastal Hazard (flood) Area, Tidal Wetlands, Beaches, Freshwater Wetlands and Watercourses, Rocky Shorefront, and Estuarine Embayment (Thames River).

The accompanying figure illustrates the location of tidal wetlands on or adjacent to the site. The southern one is a mapped, state-regulated wetland whereas the northern one is neither mapped (undesignated) nor state-regulated. However, this undesignated tidal wetland is a wetland of fact and under the CCMA, the tidal wetland policies and adverse impact considerations are applicable. Undesignated wetlands such as these are regulated under the inland wetlands program due to the poor drainage characteristics of the soil type found in these areas.

A related wetland consideration is the mapping and designation of inland wetlands on this site. There are a multitude of bona fide inland wetlands in the central region associated with a former sand and gravel operation. Here the excavation

COASTAL RESOURCES



lowered the site elevation to the point that portions of the water table are exposed or near the surface. These areas support typical wetland plants and animals. These areas do qualify as inland wetlands and are regulated by the local inland wetland agency. In the event that any proposed activities are to be located in or adjacent to these wetland areas, it is recommended that the wetland boundaries be surveyed and staked. (The general vicinity of these wetland areas is shown on the accompanying figure.)

Along the riverfront edge within the northern section of the property, there is a small sandy beach areas which is mostly surrounded by rock outcroppings. Towards the mid-section of waterfront area is a lobe consisting of sand and gravel material which was formerly disturbed by extraction activities. The railroad corridor closely aligns with the bank of the river in the southern section of the property.

Coastal Policies

Based on the on-site and adjacent coastal resources of the property as well as the preliminary listing of activities, the applicable coastal policies are listed below. (The policy references are keyed to P.R.#30, Coastal Policies and Use Guidelines.)

Coastal Resource Policies

- General Resource IA (A)
- Rocky Shorefronts IC (A)
- Beaches and Dunes ID (A)
- Tidal Wetlands IF(A,D)
- Freshwater Wetlands and Watercourses IG(A)
- Coastal Hazard Area IH (A)
- Shorelands IK (A)
- Coastal Waters and Estuarine Embayments IM (A)

Coastal Use Policies

- General Development IIA (A)
- Water Dependent Use IIB (A)
- Coastal Structures and Filling IID (A)
- Dredging and Navigation IIE(C)
- Boating IIF (A,B)

Again, any proposed activity must be consistent with all applicable coastal policies as listed above. In designing the project for this site, the policies must be used and considered as a set of guidelines for achieving an acceptable site plan. The recommendations, contained in a following section entitled Recommendations/Mitigation Measures, should be implemented to ensure project consistency with the CCMA policies.

Potential Adverse Impacts

The CSPR application relating to the final proposal must address all potential adverse impacts resulting from the project. The applicant, in completing the CSPR application, must show how these potential adverse impacts are to be either reduced or eliminated. Finally, if there are any remaining adverse impacts re-

sulting from the proposed activities, the applicant is required to demonstrate to the satisfaction of the Planning and Zoning Commission that the remaining impacts are acceptable. The following is a listing of adverse impact considerations (as defined in Section 22a-93 (15) and (17) C.G.S. of the CCMA) which may be of concern with respect to the final proposed project.

- Possible degradation of water quality through the significant introduction into either coastal waters or groundwater supplies of suspended solids, nutrients, toxics, heavy metals or pathogens, or through the significant alteration of temperature, ph, dissolved oxygen or salinity.
- Possible degradation of natural or existing drainage patterns through the significant alteration of groundwater flow and recharge and volume of runoff.
- Possible degradation or destruction of essential wildlife, finfish or shellfish habitat through significant alteration of the composition, migration patterns distribution, breeding or other population characteristics of the natural species or significant alterations of the natural components of the habitat.
- Possible degradation of tidal wetlands, beaches and dunes, rocky shore-fronts, and bluffs and escarpments through significant alteration of their natural characteristics or function.
- Possible adverse impacts on future water-dependent development opportunities.

Recommendations/Mitigations Measures

At this time, due to the preliminary nature of the plans, only a general analysis of the potential adverse impacts can be provided. The primary concerns are 1) impacts to wetlands from grading and filling, 2) degradation of coastal waters and wetland quality due to leachate from substandard septic facilities, 3) impact resultant to uncontrolled sedimentation and erosion, and 4) adverse impacts upon future water dependent development activities. To assist in avoiding or alleviating such impacts, the following recommendations should be considered while developing the final design for the proposed project.

1. All construction activities should be staged outside the wetlands areas. These wetland areas, both tidal and inland, have been identified in the previous sections of this report. One area of concern is the former sand and gravel area located in the central section of the property which is riddled with freshwater wetland. Since site preparation would require the destruction of wetlands through filling and grading, such activities should be avoided for this area as well as the other wetland areas within the property. Any proposed activity within wetland areas must achieve advance permit approval from the agency with jurisdiction (i.e., for state-designated wetlands, the permitting authority is the state Water Resources Unit of DEP and for inland wetlands, the local inland wetland agency).
2. At the north end of the property west of the railroad is a sandy upland area previously disturbed by sand and gravel extraction activities. Since there are few, if any, freshwater wetlands located here, this area would represent one of the optimum siting alternatives for recreation facilities and activities (i.e. baseball/softball field and club house).

3. In view of the extensive area of upland soil upon which to locate septic facilities, it should be possible to locate and design a system without adversely affecting coastal water or wetland quality. For septic facilities placed on the western side of the railroad, the buffer established by the railroad almost assures that coastal water quality will not be adversely affected particularly if the septic system is located an adequate distance from the natural freshwater stream at the north end of the property which discharges into the undesignated tidal wetland. Therefore, the northern upland area located west of the railroad would probably be a suitable area for the installation of a septic system such that adequate setbacks from wetlands and areas of seasonally high water tables could be achieved.
4. In terms of proposed activities located west of the railroad, the rail corridor would generally serve as a sediment trap which would preclude, in the main, the movement of sediments into the Thames River. However, in the event that activities are located adjacent to wetlands, sedimentation controls, such as hay bales and fabric silt fences, should be installed as necessary to protect the wetland areas.
5. The proposed small boat dock should be constructed as an elevated pile and timber type which will allow for tidal circulation and minimize the extent of filling in coastal waters. Alternatively, a few piles could be used in combination with a series of floats. The latter could be taken ashore during the winter which would reduce damage resulting from ice scour. It should be noted that the placement of structures and fill in coastal waters (below the mean high water line) are activities regulated by the U.S. Army Corps of Engineers and the state Water Resources Unit of DEP.
6. It is recommended that the proposed dock be located in an area that requires little or no dredging at the outset or in the future. Not only are the costs of dredging exorbitant, but the disposal of dredged material can become problematic in terms of cost and environmental protection.
7. The proposed small dock should be located in an area which minimizes disruption or degradation of natural coastal resources. Generally, the waterfront edge in this area is devoid of sensitive tidal wetlands. Little information is available on the value of submerged land and intertidal habitat within this area. Some preliminary surveys should be conducted particularly if dredging is necessary. It should also be noted that dredging is an activity regulated by the U.S. Army Corps of Engineers and the State DEP.
8. Presently, the proposed dock is to be located at the north end of the property near a bedrock outcrop. Whether this presents any engineering problems or associated hazards, such as submerged rock, is not known at this time. Another location which would also take advantage of existing water depths includes the southern portion of the central 'lobe' that projects seaward of the railroad corridor. Here the distance to deepwater and the average water depths according to the nautical charts are markedly similar to the conditions at the north end of the property. Either alternative necessitates the crossing of the railroad corridor which could be a problem.

Water Dependency Considerations

The CCMA specifically encourages the location of water dependent uses at waterfront sites suited to such uses. Waterford has recognized both the potential for waterfront access (although limited by the railroad) and the potential for the establishment of water-dependent and related uses on this site by designating it as "Waterfront Development District." Final design for this project should be based upon the requirements of this District and the following coastal management considerations.

Portions of this site may provide certain opportunities for future water dependent use given their waterfront locations, accessibility to navigable waters, and lack of tidal wetlands which therefore would not hamper the development of a water dependent use. However, the presence of the railroad corridor does impede access to the waterfront. One area which may be suited for water dependent use is the central lobe of land that projects seaward of the railroad corridor. The placement of a water-dependent use in this area would not require the destruction of sensitive coastal resources such as tidal wetlands and beaches.

A dock, marina or a boat repair facility would be permitted uses under the existing Waterfront Development zone and if designed in an environmentally sound manner, could be consistent with the CCMA.

In addition the waterfront edge of the property has some potential for coastal-oriented recreation although access to the waterfront is limited by the railroad corridor. For instance, the rocky shorefront in the northern section of the property has some visual merit due to the views of the Thames River and the opposite banks. Also, the Thames River supports a popular recreational fishery and given the nature and location of this site, a limited area may become available for fishing purposes. Such low-key, passive recreational uses may be established if safe access across the railroad track could be arranged. The proposed small boat dock does qualify as a water dependent use as defined under Section 22a-93(16) of the CCMA. If this dock is sited in such manner as to avoid impacts to sensitive coastal resources, then the project would be considered consistent with the CCMA.

The proposed baseball/softball field and club house would be permitted under the existing zone and would be considered consistent uses under the CCMA if the following standards are met:

- a. The siting of these uses on upland areas separate from the waterfront and wetland areas.
- b. The siting of these uses in such a manner as to not diminish or obstruct future water-dependent use opportunities for the property.

These aforementioned uses are not water dependent and therefore, it is unnecessary to locate these uses in immediate proximity to the waterfront.

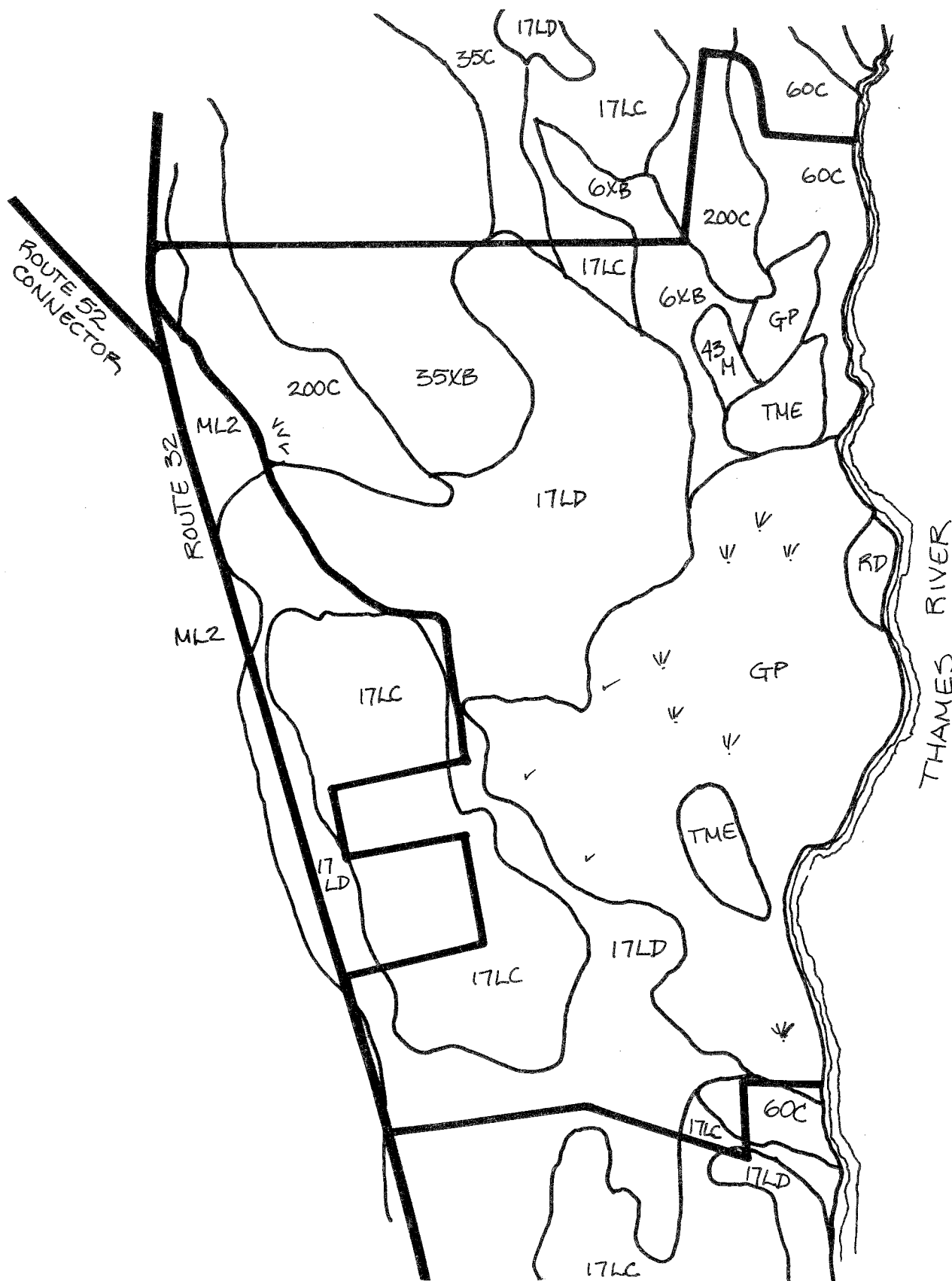
The existing Waterfront Development zone, in conjunction with the previous recommendations, should be used as a guide to preparing the final plan for the

recreational facilities. By following these guidelines, the final proposal would achieve conformance with the local zoning regulations and the CCMA. Briefly, the primary considerations in designing the final project should be (1) to locate the water-dependent uses in suitable waterfront areas and (2) to locate the other uses in upland areas thereby avoiding adverse impacts to sensitive resources and allowing sufficient access to the waterfront for servicing future water-dependent uses.

Appendix

Soils

0 660'
scale



ELECTRIC BOAT MANAGEMENT ASSOCIATION AND ATHLETIC CLUB

WATERFORD

Principal Limitations and Ratings of Soils for:
Residential Development

Soil Map Symbol & Soil Name	Dwellings with- out Basements	Dwellings with Basements	Lawns & Land- scaping	Septic Tank Ab- sorption Fields	Local Roads & Streets
CrC Charlton	Moderate-slope	Moderate-slope	Moderate-large stones, slope	Moderate-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 Hollis	Severe-slope Severe-depth to rock, slope	Severe-slope Severe-depth to rock, slope	Severe-slope Severe-slope, thin layer	Severe-slope Severe-depth to rock, slope	Severe-slope Severe-depth to rock, slope
HkC Hinckley	Moderate-slope	Moderate-slope	Severe-small stones, droughty	Severe-poor filter	Moderate-slope
NgB Narragansett	Slight	Slight	Moderate-large stones	Slight	Moderate-frost action
NIC Narragansett	Moderate-slope	Moderate-slope	Moderate-large stones, slope	Moderate- slope	Moderate-slope, frost action
Hollis	Severe-depth to rock	Severe-depth to rock	Severe- thin layer	Severe-depth to rock	Severe-depth to rock
PbC Paxton	Moderate-wetness, slope	Moderate-wetness, slope	Moderate- slope	Severe-percs slowly	Moderate-wetness slopes, frost action

Soil Map Symbol & Soil Name	Dwellings with- out Basements	Dwellings with Basements	Lawns & Land- scaping	Septic Tank Ab- sorption Fields	Local Roads & Streets
Montauk	Moderate-wetness, slope	Moderate-wet- ness, slope	Moderate-slope	Severe-percs slowly	Moderate-wetness, slope, frost action
PdB Paxton	Moderate-wetness	Moderate-wet- ness	Moderate-large stones	Severe-percs slowly	Moderate-wetness, frost action
Montauk	Moderate-wetness	Moderate-wet- ness	Moderate-small stones, large stones	Severe-percs slowly	Moderate-wetness, frost action
Rn* Ridgebury	Severe-wetness	Severe-wetness	Severe-wetness	Severe-percs slowly, wetness	Severe-wetness, frost action
Leicester	Severe-wetness	Severe-wetness	Severe, wetness	Severe-wetness	Severe-wetness, frost action
Whitman	Severe-ponding	Severe-ponding	Severe-large stones, ponding	Severe-percs slowly, ponding	Severe-frost action, ponding
Wh* Westbrook	Severe-flooding, ponding, low strength	Severe-flooding, ponding	Severe-excess salt, excess sulfur, ponding	Severe, flooding, ponding	Severe-ponding, flooding, low strength

Ub

Udorthents - Pits complex, gravelly

Requires on-site investigation (see attached soils report)

*Designated wetland soil by Public Act 155

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 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.

WATERFRONT DEVELOPMENT DISTRICT - WD

Section 14

14.1 Purpose

The purpose of the Waterfront Development District is to encourage a mixture of land uses, with emphasis on waterfront access and water dependent and related uses (defined by the State of Connecticut as "those uses and facilities which require direct access to, or location in, marine or tidal waters and which therefore, cannot be located inland, including but not limited to: marinas, recreational and commercial fishing and boating facilities, finfish and shellfish processing plants, waterfront dock and port facilities, shipyards and boat facilities, navigation aids, basins and channels, industrial uses dependent upon waterborne transportation or requiring large volumes of cooling or process water which cannot reasonably be located or operated at an inland site and uses which provide general public access to marine or tidal waters").

The Town of Waterford contains a number of valuable waterfront areas, which have potential for waterfront development. These areas include several of the Thames River peninsulas and portions of the Mago Point area on the Niantic River. The Waterfront Development District is designed to achieve the most appropriate use of land and structures in these waterfront areas and consistent with the design guidelines included here and in special plans adopted by the Planning and Zoning Commission for Mago Point or any of the designated Thames River peninsulas.

14.2 Permitted Uses

The following water-oriented uses are permitted by right:

- 14.2.1 Public and private parks and playgrounds.
- 14.2.2 Yacht clubs and marinas, including uses accessory to them such as swimming pools, tennis courts, racquetball facilities.
- 14.2.3 Boat docks, slips, piers and wharves for yachts and pleasure boats or for boats for hire carrying passengers on excursions, pleasure, or fishing trips or for vessels engaged in fishery or shell fishery.
- 14.2.4 A yard for building, storing, repairing, selling or servicing boats which may include the following as an accessory use: office for the sale of marine equipment or products,

dockside facilities for dispensing fuel, restroom and laundry facilities to serve overnight patrons. Furthermore, adequate lanes must be provided to allow access and egress throughout the yard for fire trucks.

- 14.2.5 Boat and marine engine sales and display, yacht broker, marine insurance broker.
- 14.2.6 The rental of boats.
- 14.2.7 Retail sale or rental of boating, fishing, diving and bathing supplies and equipment.
- 14.2.8 A sail loft or ship's chandlery.
- 14.2.9 Swimming pools and swimming clubs.
- 14.2.10 Museums with nautical themes.

14.3 Uses Permitted Subject To The Approval of a Special Permit

The following uses may be permitted in the WD District if approved by the Commission in accordance with the provisions of Section 23 of these regulations.

- 14.3.1 Retail stores and service establishments.
- 14.3.2 Restaurants, except fast food restaurants.*
- 14.3.3 Professional offices.
- 14.3.4 Residential uses up to a maximum density as provided for in Section 18 herein.
- 14.3.5 Hotels and motels.
- 14.3.6 Commercially-operated tennis courts and/or private tennis clubs and similar facilities for racquetball and paddle tennis.
- 14.3.7 Port facilities for bulk shipping and storage facilities, whether indoor or outdoor.
- 14.3.8 Radio or television antennas, flagpoles, towers, chimneys, water tanks or standpipes, any of which extend more than 40 feet above the ground.

*Fast food restaurants should be defined. In Section 20, Parking, the Town defines them as those where customers are served primarily by counter service.

- 14.3.9 Base operations for fishing and lobstering business, including as an accessory use of such business a store or market for the sale of fish, shellfish, and other related food products, and/or the commercial bulk processing of fish and shellfish.

14.4 Lot and Building Requirements

The following lot and building requirements shall be met except as provided for in Section 3.7 of these regulations or as otherwise provided in this section.

14.4.1 Minimum Lot Size

The minimum lot size shall be 20,000 square feet.

14.4.2 Minimum Lot Frontage and Width

No lot in this district shall have less than 50 feet of frontage on a public street and each lot shall be at least 50 feet wide at the building line.

Where the Commission deems it infeasible to create a public street because of physical limits, railroad, etc., it may approve a site plan for use which does not have frontage on a public street, provided that the lot meets all other requirements and access is assured by covenants or other instrument acceptable to the Planning and Zoning Commission.

14.4.3 Minimum Setbacks

Front yard - 20 feet.

Side yard - 10 feet; the Commission may permit a reduction in the side yard to "0" if in its judgment such a reduction will help to achieve the purposes of the district. If a side yard is provided, however, it must be at least 10 feet.

Rear yard - 20 feet.

In no case shall new construction at the foundation line be less than 25 feet from the Niantic River or Thames River at mean water level elevation.

14.4.4 Building Coverage

The aggregate building coverage on any lot in this district shall not exceed 50% of the total area of said lot.

14.4.5 Maximum Building Height

No building in this district shall be constructed, reconstructed, extended, enlarged, moved or altered in any way so as to have a maximum height in excess of 25 feet, except as provided in Section 3.6 of these regulations, and Section 14.8.2.2 below.

14.4.6 Building Width

The total cumulative width of buildings, structures, fences or walls more than 30 inches in height which are located adjacent to the Niantic River or Thames River shall not occupy more than 40% of the width of a parcel as measured along a line parallel to and 25 feet from the river, except as provided for in 14.8.2.2 below.

14.5 Off-Street Parking

Off-street parking spaces shall be provided for each lot within this district in accordance with the provisions of Section 20 of these regulations.

Required parking facilities shall be located on the same lot as the building or other use which they serve except as follows:

- 14.5.1 Because the WD District is important to the Town's economy, provides a local service and employment base, and because its physical integrity must be enhanced, and further because it is desirable to utilize existing buildings as fully and as efficiently as possible, required parking for uses within the WD District may be provided on sites other than the site which they serve provided that:
- (a) Said spaces are within 400 feet walking distance of the lot or use which they serve.
 - (b) Said spaces are consistent with the guidelines as set forth in 14.8.1.
 - (c) The parking lot or spaces shall conform to the provisions of the district in which they are located except that in the case of a privately owned lot if they are serving a primary use outside the district in which they are located, the parking area shall be classified as a permitted accessory use.
 - (d) Such spaces shall be in the same ownership as the use which they serve and shall be subject to a deed restriction binding the owner and his heirs and assigns to maintain the required number of spaces either (1) through the existence of the use to which they are accessory, or (2) until such spaces are provided elsewhere.

14.6 Signs

All signs erected within this district shall conform to the requirements of Section 21.6 of these regulations.

14.7 Environmental Protection

No development shall be undertaken on any lot within this district nor shall the existing character including vegetation and topography be disturbed from its natural state except in accordance with the provisions of Section 25 of these regulations.

14.8 Site Plan Approval

A site plan shall be submitted to the Commission in accordance with the provisions of Section 22 of these regulations, and no building or structure, parking lot, sign or outdoor use of land, except those used for a one-family dwelling and their accessory uses, shall be used, constructed, enlarged or moved until said site plan has been approved by the Commission.

14.8.1 Guidelines

In addition to the considerations set forth in Section 22 and Section 23, the Commission shall consider the purposes of this section and the specific design guidelines set forth in Master Plans for Mago Point or Thames River peninsulas that are adopted by the Planning and Zoning Commission as well as the following factors during their review:

- 14.8.1.1 The quality and extent of views from the adjacent public streets through the property to the water.
- 14.8.1.2 The design and relationship of development to the waterfront as viewed from the water.
- 14.8.1.3 The design and function of any easements or other access provided to the bulkhead, including new bulkheading or docking facilities.
- 14.8.1.4 The eligibility of proposed development to utilize any of the development incentives set forth below.
- 14.8.1.5 Traffic, parking, and pedestrian circulation recommendations contained in any plans for the area.

14.8.2 Modifications to Height and Width as incentives to achieve purposes and design guidelines.

14.8.2.1 Height

- (a) For every reduction of 10% in coverage below the maximum 50%, an additional 10 feet of height may be permitted up to a maximum of 45 feet.
- (b) Maximum height may be increased by 10% up to a maximum of 45 feet if permanent public access to the river is provided. Such access, in the form of a permanent easement, shall be at least 12 feet wide from the street to the water and 8 feet along the width of the property along the water.

14.8.2.2 Building Width

The total cumulative width of buildings, structures, fences or walls more than 30 inches in height which are located on property directly on the river shall not occupy more than 40% of the width of a parcel as measured along a line parallel to and 25 feet from the river.

Building width may be increased under the conditions set forth below:

- (a) Maximum width may be increased to 50 percent if permanent public access to the Thames River is provided as set forth in Section 14.8.2.1(b) above.

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 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, 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.