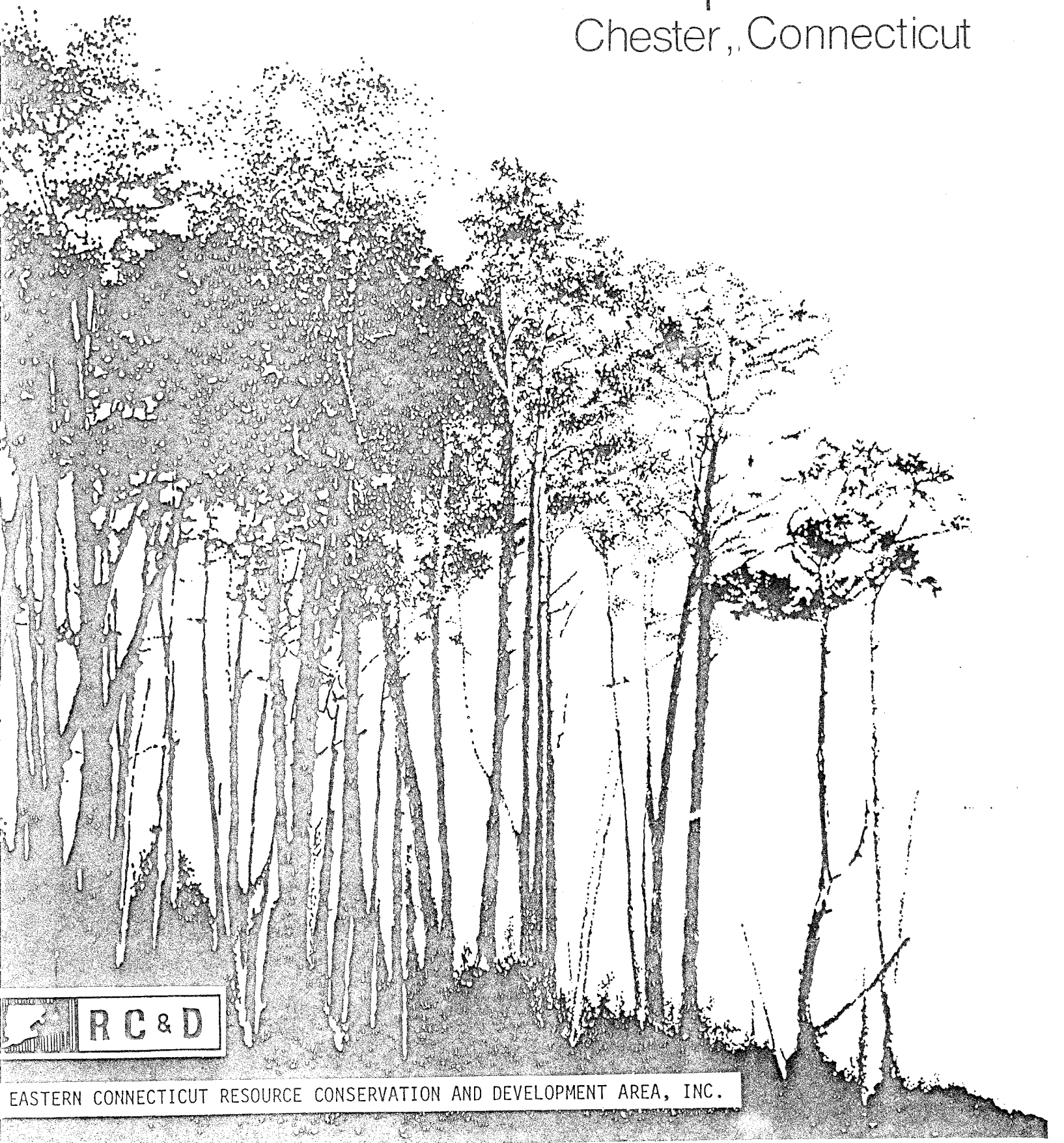
Environmental Review Team Report

Camp Hazen

Chester, Connecticut



R C&D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report

Camp Hazen

Chester, Connecticut

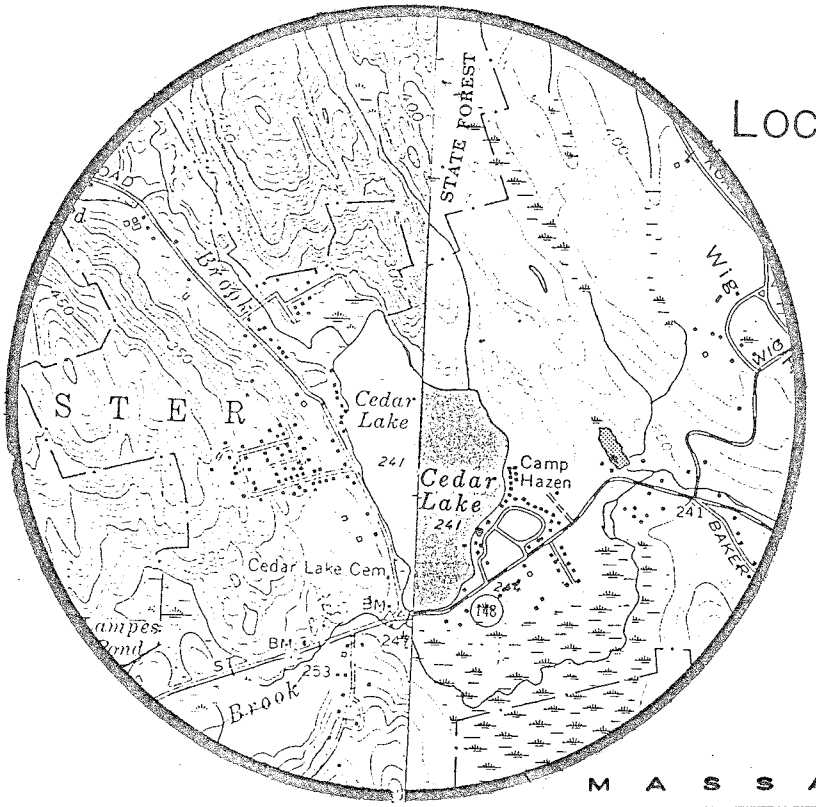
September 1983

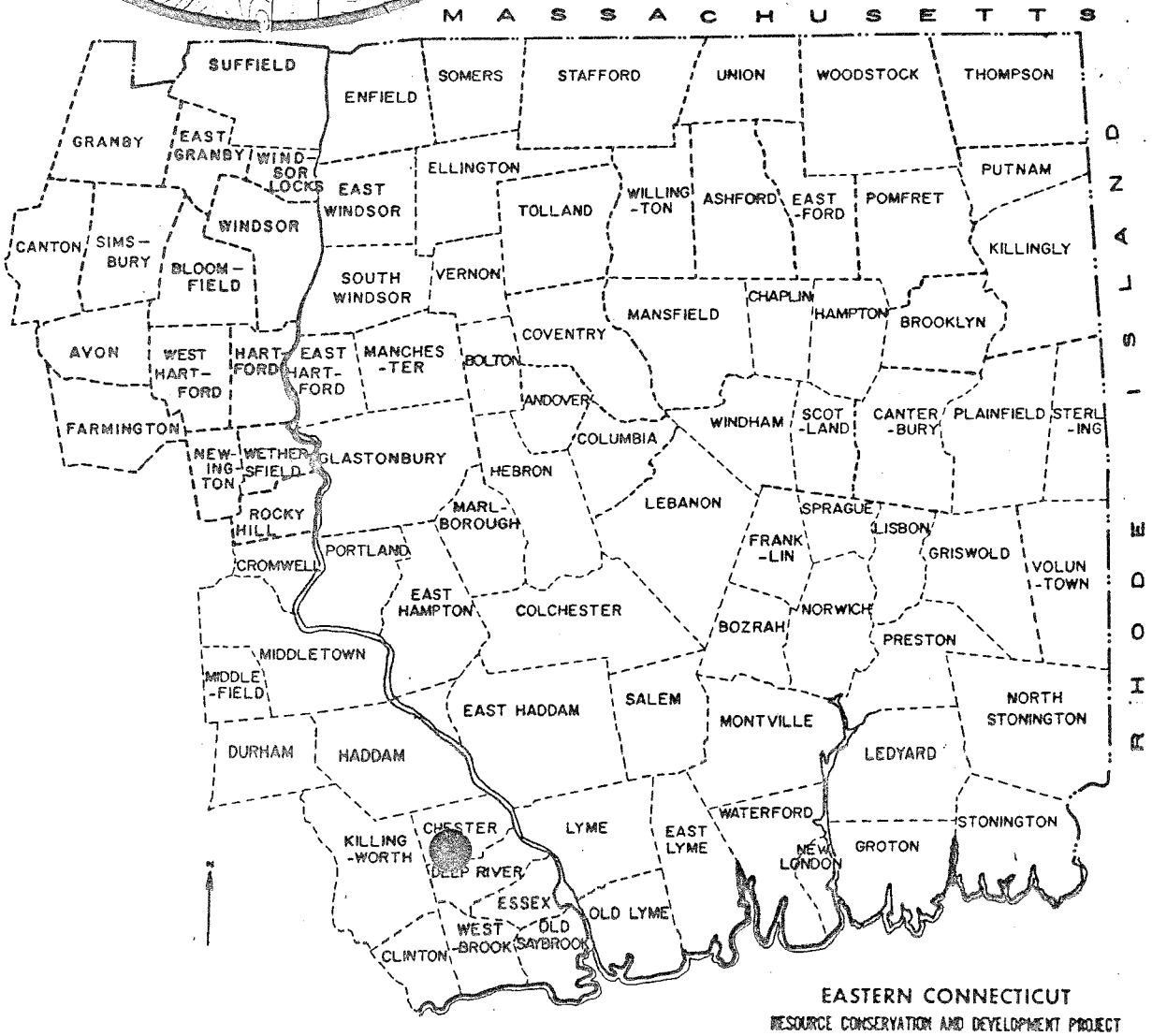
Eastern Connecticut Resource Conservation & Development Area

Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234

Location of Study Site

CAMP HAZEN
CHESTER, CONNECTICUT





EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
CAMP HAZEN
CHESTER, CONNECTICUT

This report is an outgrowth of a request from the First Selectman of Chester to the Middlesex 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. The request was approved by the RC&D Executive Committee and the measure was reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist from the United States Department of Agriculture, Soil Conservation Service (SCS). Reproductions of the soil survey map, a table of soils limitations for certain land uses and a topographic map showing property boundaries were distributed to all Team members.

The ERT that field-checked the site consisted of the following personnel: Pat Scanlon, District Conservationist (SCS); Bill Warzecha, Geologist, Connecticut Department of Environmental Protection (DEP); Rob Rocks, Forester, DEP; Paula Bepko, Sanitarian, State Department of Health; John Rook, Wildlife Biologist, DEP; Richard Joly, Planner, Connecticut River Estuary Regional Planning Agency; Bob Dlugolenski, Recreation Specialist, DEP; Tim Dodge, Resource Conservationist, SCS; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Thursday, August 4, 1983. Reports from each contributing Team member were sent to the ERT Coordinator for review and summarization for the final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Chester. 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.

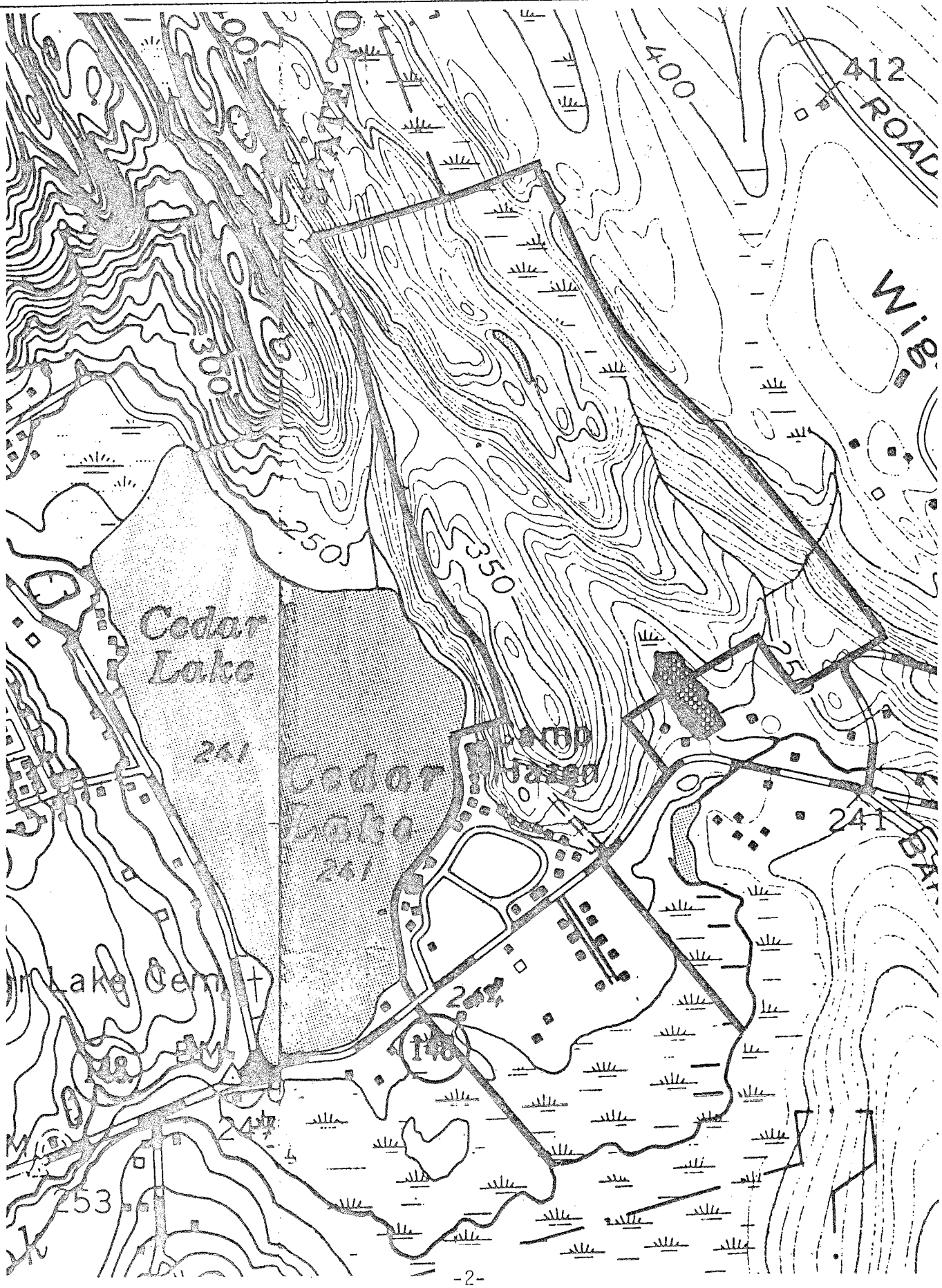
The Eastern Connecticut RC&D Area Committee hopes that this report will be of value and assistance in making any decisions regarding this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, Route 205, Brooklyn, CT 06234, 774-1253.

Topography

Site Boundary

0 660'
scale



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare a natural resource inventory and environmental assessment of proposed recreation development at Camp Hazen in Chester. The camp property is approximately 170 acres in size and is owned by the Connecticut YMCA, Inc. It is located on the eastern and southern sides of Cedar Lake, on the northern and southern sides of Route 148.

The Camp is presently planning to extend its facilities into its undeveloped property. Additional recreational facilities would include expansion of the existing horse-riding area, horse riding trails, hiking trails and a "wilderness" camping area. They would also like to implement the second phase of their foresty management program.

Any development that does take place on this site should take into account the steep terrain and wetlands that cover much of the area. The horse riding trails should be constructed along the contours of slopes, not across slope contours. The same precaution should be taken if any roads are developed for timber harvesting or access to camp sites.

Much of the area has very shallow depths to bedrock. If a sanitary waste disposal system is developed for the new campsite an area should be located which has an adequate soil depth for the development of such a system. Shallow depth to bedrock also presents problems in developing water supply, especially if a sanitary waste disposal system is located nearby.

The Cedar swamp which is accessible from South Campus has a small trail out into it constructed primarily of refuse. This trash should be removed and in its place perhaps a wooden walkway and canoe launch should be built. This would allow access to this unique eco-system, expanding the nature study opportunities at the camp.

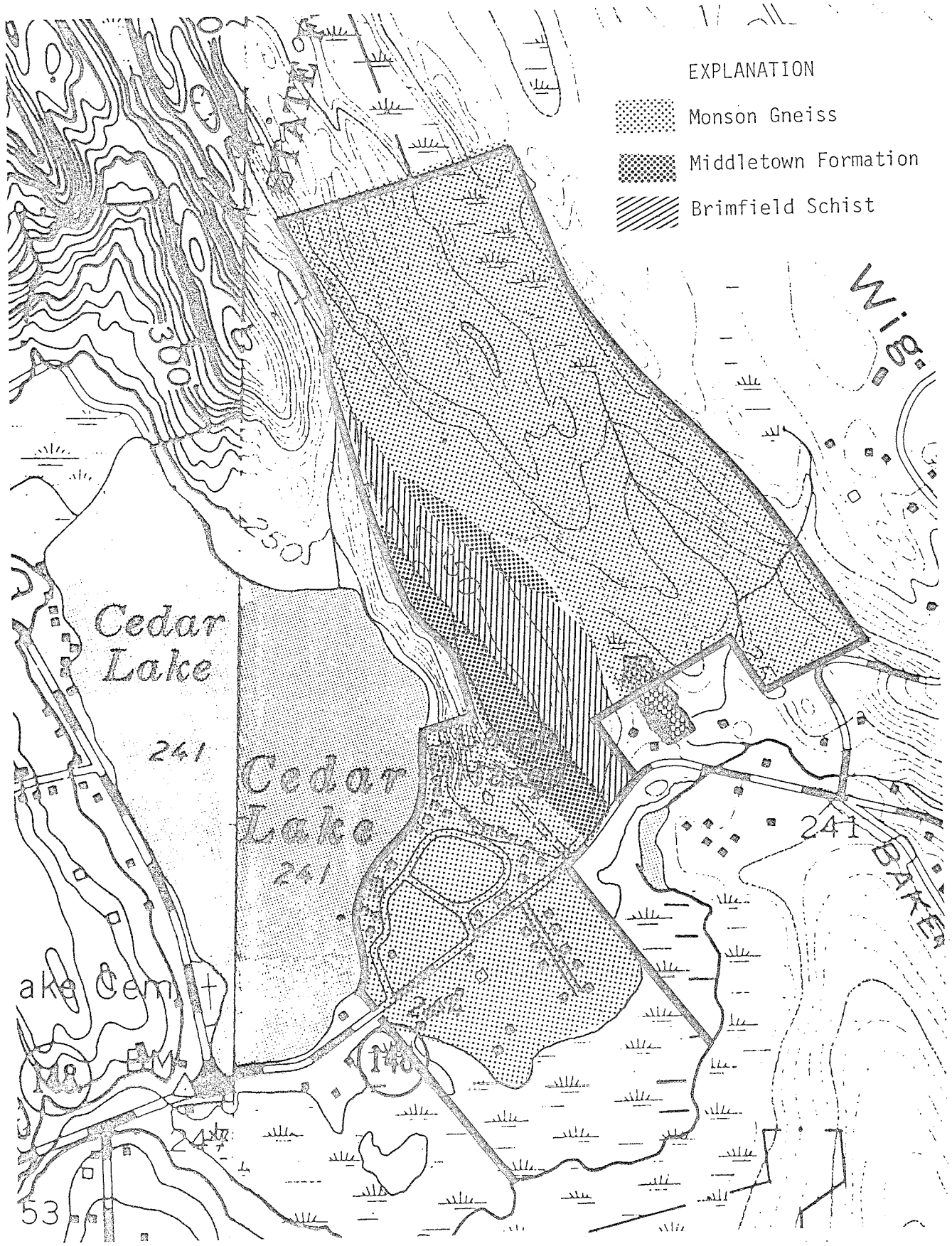
Team members have discussed their concerns and observations in detail in the following sections of this report.

ENVIRONMENTAL ASSESSMENT

TOPOGRAPHY

The ±170 acre parcel, which is irregularly shaped, lies east of Cedar Lake in the southern section of Town. The site is characterized by a generally flat area in the southern section of property, which includes North and South Campus and an area of rugged terrain which makes up the remainder of the property. The area of rugged terrain includes portions of two ridges which trend generally in a northwest to southeast direction. The ridges have several steep west facing scarps (cliffs formed by faulting), moderate (15-25%) east slope and a flat topped summit which affords campers with a scenic view to the west. Elevations on the site range from ±240 feet above mean sea level thoroughout generally flat portions of the site (North and South Campus), to ±440 feet above mean sea level at a point on top of the ridge in the northern section of the property.

Bedrock Geology



BEDROCK GEOLOGY

Numerous rock outcrops are visible throughout the site, north of the main campus, mostly along the scarps and on top of the ridges. The rock types that make up the ridges have been classified as gneisses and schists, both of which are crystalline metamorphic (geologically altered by great heat and pressure) rocks. In gneisses, thin bands of elongate or flaky minerals alternate with layers of granular minerals. Schists are commonly characterized by the alignment of elongate or flaky minerals, giving the rock a slabby or well-layered structure and often allow the rock to easily split along the layers.

The predominant rock type underlying the site is classified as Monson gneiss. This rock is an interlayered light to dark, mostly medium to coarse grained gneiss and amphibolite. The gneiss is composed of minerals plagioclase, quartz and biotite with hornblende in some layers and microcline in others. Also, there are trace amounts of the minerals garnet, epidote and magnetite. "Amphibolites" are rocks consisting mainly of the minerals amphibolite and plagioclase. Quartz is usually absent or present in small amounts. As the amount of quartz increases, there is a gradation to hornblende-plagioclase gneiss.

The next most abundant rock type is classified as the Brimfield formation. This rock is a gray, rusty weathering, medium to coarse grained interlayered schist and gneiss composed of the minerals oligoclase, quartz, potassium feldspar and biotite. The minerals garnet, sillimanite, graphite and pyrrhotite are also commonly found in the rock.

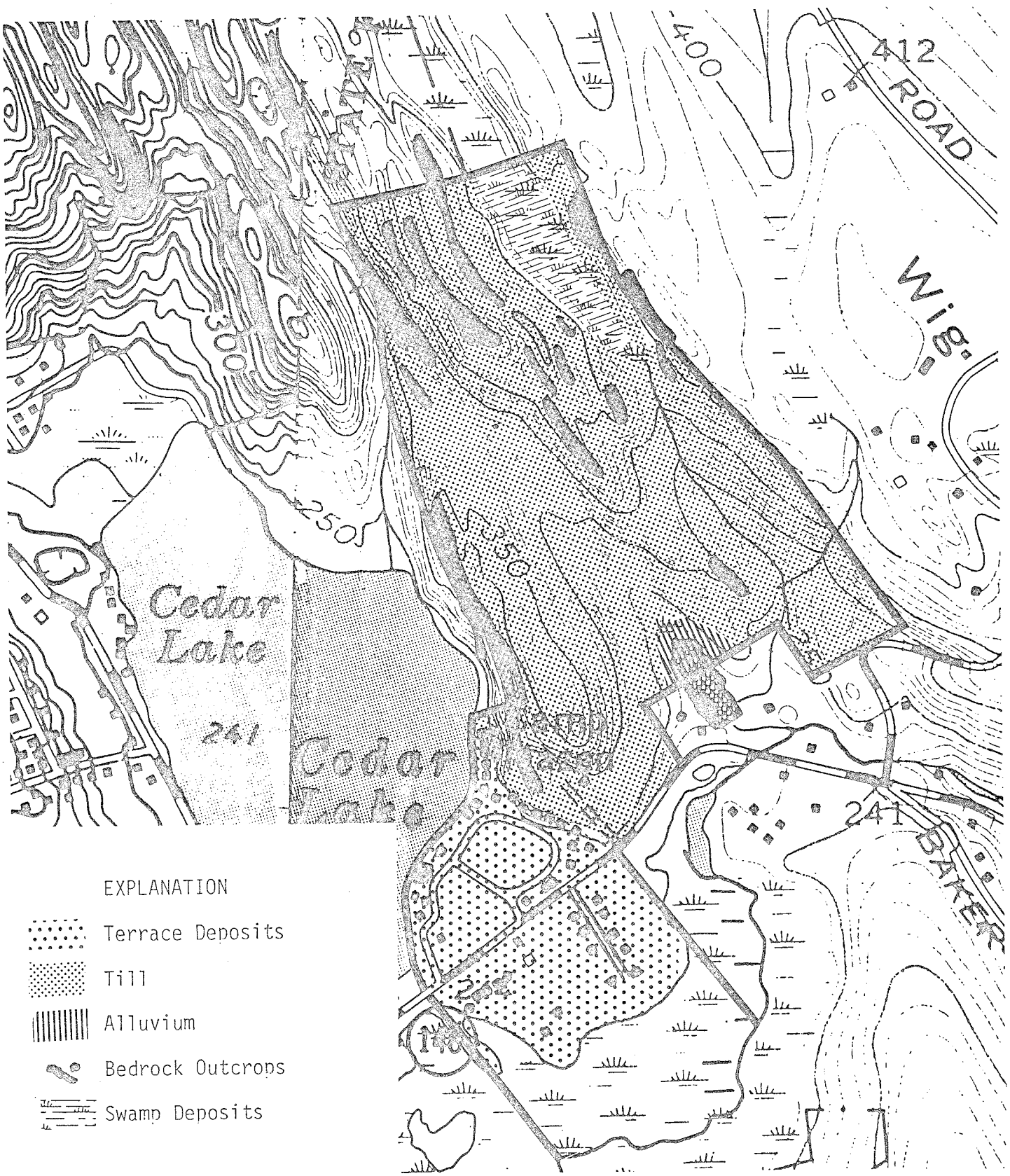
A third rock type is classified as Middletown formation. These rocks are a rust stained quartz-feldspar gneiss with interlayered amphibolite. See accompanying bedrock geologic map for the approximate distribution of each rock type within the parcel.

A bedrock geologic map of the Deep River Quadrangle in which the site is located was prepared by Lawrence Lundgren, Jr. and is available at DEP's Natural Resource Center in Hartford.

SURFICIAL GEOLOGY

The predominant surficial (unconsolidated material overlying bedrock) deposit on the site is till. Till covers most of the parcel north of the main campus and is relatively thin in thickness throughout. (See accompanying map.) Till consists of a non-sorted mixture of sand, silt, clay, gravel and boulders. These materials were collected, transported, and re-deposited directly, without sorting by an ice sheet as it moved through the region about 12,000 years ago. The texture of till where less than five feet is commonly sandy, very stony and loose. However, where the till is more than five feet thick and sometimes shallower the lower portion of the deposit (5-10') is frequently siltier and tightly compact. There was no information to the Team regarding the thicknesses of till on the site. Based on visual inspection and the surficial geologic map, it is likely the till deposits are generally shallow (less than five feet thick) throughout most of the upland area north of the main campus. However, in some areas of the parcel the thickness of till may be up to ten feet. Till in the northeast section of the parcel is overlain by swamp deposits. (See accompanying surficial map.) Swamp deposits consist of partly decomposed organic material mixed or inter-bedded with sand and silt. Thickness of the swamp deposits are probably not more than three feet.

Surficial Geology



Another glacially deposited sediment, which overlies bedrock on the site throughout the main campus in the southern section of the property, are terrace deposits. "Terrace deposits" refer to glacial sediments that were deposited by a meltwater stream which ponded against a stagnant ice sheet. The deposits consist of poorly sorted, medium to coarse micaceous (mica-rich) sand. Based on the well completion report of the drilled well serving the Camp, the thickness of these deposits are 42 feet.

A third surficial deposit, found primarily along the unnamed stream and around the small pond in the southeast section of the parcel is alluvium. "Alluvial deposits" are recent stream deposited sediments consisting of poorly sorted gravel with layers of sand and capped with a thin layer of silt.

A seasonally high water table and precipitous slopes appear to be the most significant geological limitations in the use of the site. The areas of high groundwater, due mainly to the presence of bedrock or compact till at shallow depths, impedes subsurface drainage often resulting in a seasonally high groundwater table. These areas were observed throughout the eastern half of the site. It may be difficult to create bridle paths and/or hiking trails in these wet areas as well as to maintain them since these areas are likely to become very muddy during the normally wet time of the year. Also, those trails on the steep slopes along the ridges in the eastern half of the site may prove to be dangerous for horseback riders and may create a potential erosion problem on these slopes during wet times. Therefore, judicious care would need to be taken in laying out the horse and hiking trails, avoiding the wet areas and precipitous slopes as much as possible.

HYDROLOGY

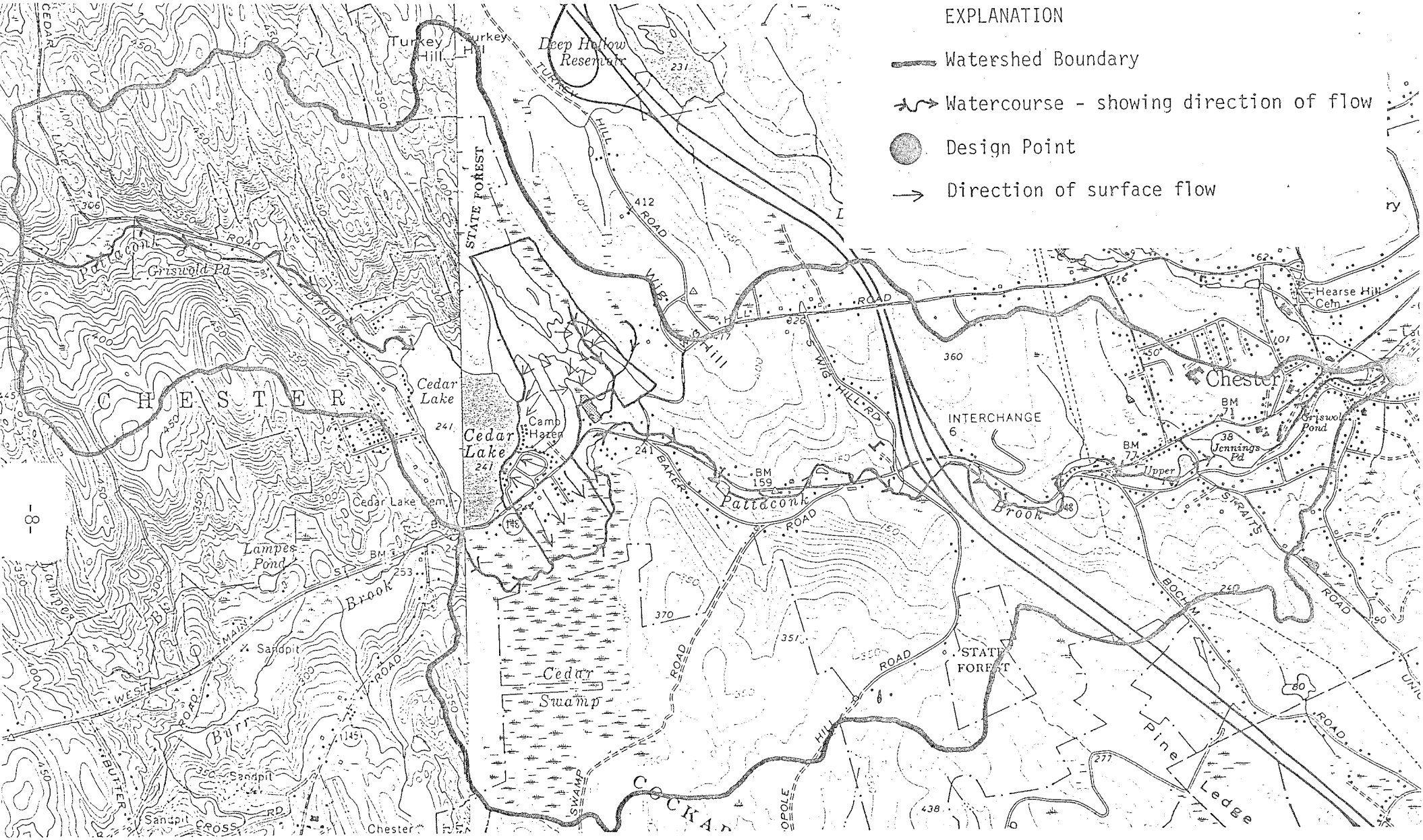
The entire site lies within the watershed of Pattaconk Brook. Most of the parcel drains into Pattaconk Brook in a south-southwest direction via sheet flow and intermittent streams. A small portion of the site, which is approximately 5% of the total site, drains in a westward direction by sheet flow into Cedar Lake. (See accompanying watershed/boundary map.) Cedar Lake is a naturally formed lake whose surface area is ±68 acres. It has a maximum depth of 45 feet and an average depth of 19 feet. The lake is fed by Pattaconk Brook, another stream which enters the lake on the north shoreline and bottom springs. The lake drains into Cedar Swamp by Pattaconk Brook south of the main campus. Several small intermittent streams exist throughout the eastern half of the site. The flow pattern of these various local watercourses are controlled largely by bedrock structure. A linear shaped wetland which includes a series of small, flooded ponds in the north central portions of the site reflect the shallowness of the soil and the impeding of groundwater movement by bedrock.

Based on well dates found in Connecticut's Water Resource Bulletin #30 (Lower Connecticut River Basin), the drilled well serving Camp Hazen taps the terrace deposits overlying bedrock in the main campus area. The well, which is 42 feet deep, yields 25 gallons per minute. Thick, stratified sand and gravel deposits are commonly conducive to high yielding water supplies. In view of these sand deposits, it seems likely that an adequate yield for an additional well or wells could be obtained from relatively shallow wells (less than 50 feet deep) throughout the main campus area. However, these types of soils tend to have a very rapid percolation and as a result may not effectively filter and/or renovate sewage system effluent as it moves laterally or vertically. Therefore, should the need arise for an additional well in the main campus area, it is recommended that judicious care be taken in the placement of such

Drainage Areas

0 660'
scale

N



a well. In general, the wells should be located at higher points within this area and in a direction which would be away from the normally expected flow of contaminants, i.e., sewage systems, fuel storage tanks, etc.

Board members from Camp Hazen indicated to the Team during the review, that future plans may be to expand the existing horse riding facilities as well as primitive type campsites in the upland areas throughout the northeast section of the parcel. As a result there may be a need for an additional water source in this area. Since there are no stratified drift deposits in these areas, the likely source of a water supply would be the bedrock itself. Water is transmitted through bedrock by fractures. Consequently, the yield of bedrock based wells depends upon the size and number of water-bearing fractures that are intersected by the wet shaft. Since fractures are distributed irregularly in bedrock, it is very difficult to predict the yield of a well drilled in any particular location. Usually, bedrock wells can supply a small but reliable yield. Based on statistical information in Connecticut Resource Bulletin #30, the probability of obtaining just under 2 gallons per minute (gpm) from a bedrock based well is approximately 90 percent. On the other hand, the probability of obtaining 20 gallons per minute is approximately 9 percent. Two well completion reports for nearby wells tapping the underlying crystalline, metamorphic bedrock which is similar in composition to the bedrock underlying the eastern half of the parcel, they reported yields of 2 gallons per minute each, at depths of 238 feet and 210 feet.

Water from crystalline bedrock wells especially those tapping rusty weathered schist may have elevated iron and/or manganese levels. When iron and/or manganese levels are elevated in water, they may cause objectionable conditions such as 1) a brown color to laundered goods, 2) metallic taste to drinking water as well as affecting the taste of beverages made with the water, i.e., coffee, tea, soft drinks, etc. Under such conditions, the water would probably need appropriate treatment before being acceptable for various domestic uses.

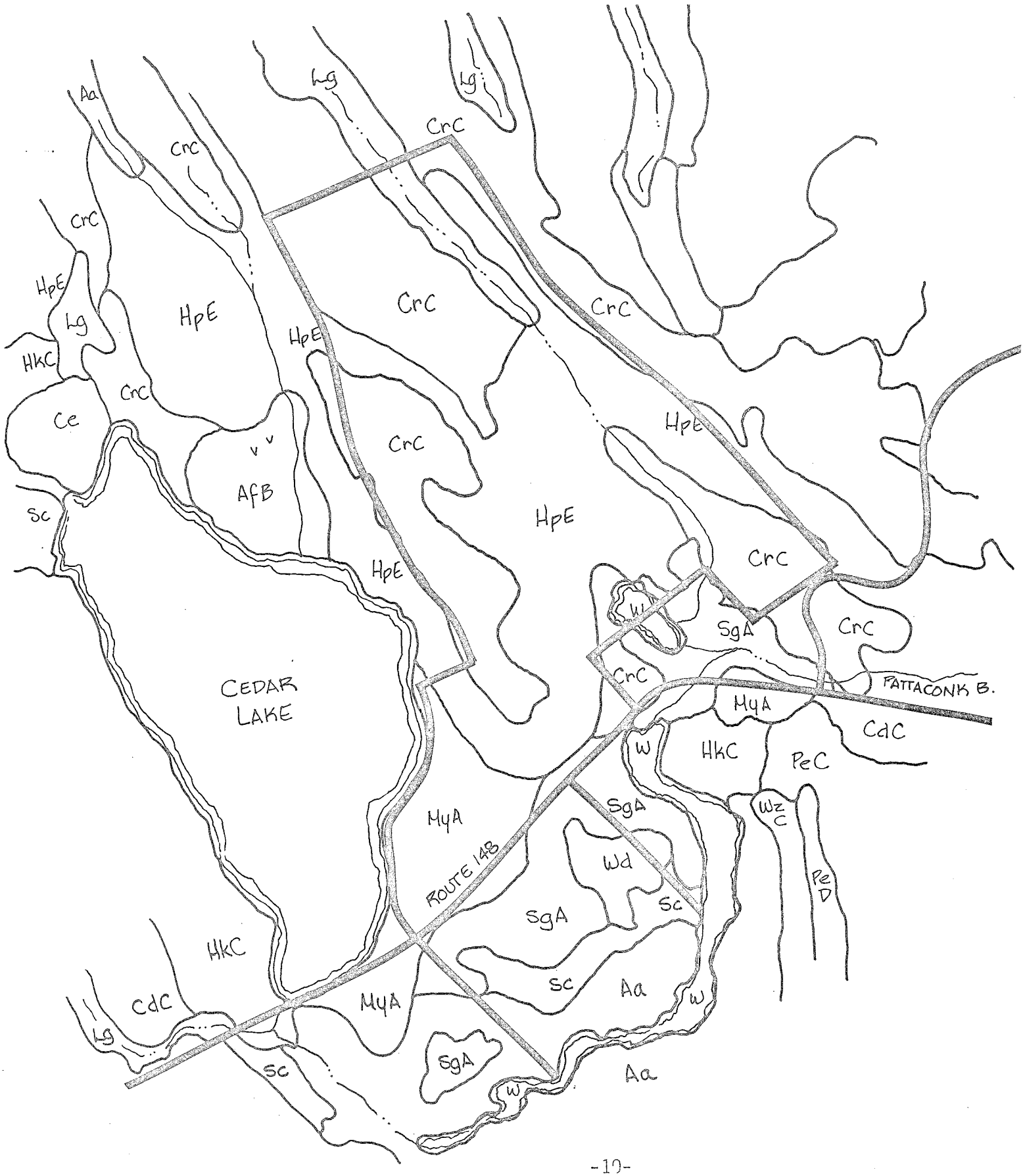
Another concern expressed by a Board member was with regard to the crossing of small streams and wetland areas by horse trails. It appears that if properly engineered and constructed that such crossing would be feasible. Provisions should be made for removing unstable material beneath the trail backfilling with permeable fill material. Also, it would be most preferable to construct the crossings during the dry time of the year and plans should also include provision for effective erosion and sediment control.

SOILS

Soil types occurring within the boundaries of Camp Hazen may be placed into two distinct groups based on underlying parent materials and topography.

To the south and east of Cedar Lake along both sides of Route 148 is a level plain consisting of outwash sands and gravels deposited by glacial meltwaters. Soils which have formed from these parent materials are mainly sandy loams. The drainage characteristics of these soils range from the somewhat excessively drained Merrimac sandy loams (MyA) to moderately well drained Sudbury sandy loams (SgA), to very poorly drained Scarboro mucky loamy fine sands (Sc). The Camp's property also includes a small portion of the large Cedar Swamp to the south. Here the predominant soil type is Adrian muck (Aa), a very poorly drained soil which has an organic layer 24 inches thick overlying a substratum of dark gray gravelly sand.

Soils


0
660'
scale
N
Aa
CrC
lg
HpE
HkC
Ce
AfB
Sc
CEDAR LAKE
MyA
ROUTE 148
SgA
Wd
W
HkC
PeC
CdC
WzC
PeD
FATTACONK B.
Aa

Most of the permanent camp facilities are located within this level area to the north and south of Route 148. It is the best area on the property for siting buildings and intensively used recreational facilities. Merrimac sandy loams have rapid permeability; however, and onsite septic systems may cause pollution of goundwater if improperly designed. Lawns, shallow-rooted trees, and shrubs may require watering in the summer months.

A gently sloping area of Sudbury sandy loams also occurs east of the main camp, near the existing horse stable and pasture on Wig Hill Road. This area will be cleared of trees and brush during the 1983-84 winter months and planted with pasture grasses in early September 1984, according to a conservation plan developed with the USDA Soil Conservation Service.

Upland Terrain

Most of the remainder of the Camp Hazen property is wooded. The terrain is variable and consists of steep ridges, bedrock cliffs, intermittent drainageways with moderate slopes, level ridge top areas and small depressions where ponded water occurs during wet periods of the year. Soil types in this area are stony, fine sandy loams formed from glacial till deposits or weathered bedrock..

Charlton-Hollis very stony fine sandy loams occur on 3 to 15 percent slopes (CrC). These are well drained and somewhat excessively drained soils. The soils of this complex occur in an intricate pattern and vary in depth from 15 inches to greater than 5 feet. Hollis-Charlton extremely stony fine sandy loams occur on 15 to 40 percent slopes. A greater percentage of this well to excessively drained complex consists of shallow to bedrock soils. Steep exposed bedrock cliffs also occur within this soil area.

Located within the drainageways and depressions of the uplands are Leicester, Ridgebury, and Whitman extremely stony fine sandy loams. These are nearly level to gently sloping, and poorly to very poorly drained wetland soils.

Camp Hazen's riding ring and stable are situated on a level midslope site on Charlton-Hollis very stony fine sandy loams. Land uphill from the stable is wooded and the area downslope is in pasture. A diversion should be installed at the base of the wooded uphill slope to carry surface water around the stable and manure storage area. Currently, horse manure is stockpiled in a level grassed area and should not be a pollution hazard. The most manure that 10 horses would generate over a 10 week period is about 30 cubic yards. This can be spread annually in the early fall over the pasture area.

No significant erosion is evident in the existing pasture. However, vegetative cover is poor. The 1.5 to 2 acre area is too small for pasturing 10 horses, even for the three to four month period they are to be kept at the camp. The new pasture area should help this situation. The existing pasture should be reseeded and managed according to a conservation plan.

A trail should be constructed down the 15% wooded slope between the two pastures. It should be oriented diagonally across the slope and have a sustained grade of 8% or less. The trail should be benched, outsloped, and covered with a firm layer of wood chips or gravel. Cut and fill banks should not exceed 2:1 slope, and should be stabilized with vegetation, retaining walls, or wood chips. Adequate water control measures such as uphill ditching and water bars should be installed to prevent erosion.

The water bars should be installed on a 30^{o} angle across the trail, and they should outlet into a well-vegetated area or drainage ditch.

Planned riding trails through the upland area will follow existing abandoned roads and logging access roads, where possible. The roads should be regraded, outsloped, and surfaced with gravel in steeper sections. Ditches and water bars or broad-based dips should also be installed for erosion control.

New trail sections should be installed along side slopes or at the edge of ridge tops and away from the centerlines of existing drainageways. Sustained grades should not exceed 8 percent. Fill may be required for benching of the trail in shallow soil areas. Properly designed bridges or culverts will be used at stream crossings. Approach ramps to bridges and fords should not exceed 10 percent grade.

At one section along the proposed trail loop it is necessary to descend a steep, sustained 10-25 percent slope. Here a series of switchbacks should be used to maintain a trail grade of no greater than 8 percent. Benching and outsloping of the trail will be necessary. Uphill cut banks should be protected with retaining walls of treated timber, gabions or well-placed stone. Again, a system of water bars or broad-base dips should be installed for water control.

Properly constructed and maintained, the completed trail network can serve multiple uses for fire and emergency vehicle access, logging operations, and jogging, cross-country skiing and other trail-oriented recreational/educational activities. Also, a well-defined path will discourage wandering and trampling of vegetation which stabilizes the thin erodible soils occurring throughout the upland area. Native or adapted plant materials can be used as a hedge or barrier to prevent "shortcutting" at curves.

For erosion and sediment control during logging operations, the following guidelines should be adhered to:

- Avoid logging during wet seasons on soils with limited trafficability.
- Keep skid trail grades less than 10 percent where possible.
- Avoid logging in or too close to streams. Logs should be skidded uphill from a stream.
- Seed skid trails and other disturbed areas after completion of logging operations.
- Leave protective strips between water courses and roads, skid trails, or disturbed areas.

WILDLIFE

The Camp Hazen property is approximately 170 acres in size. Mature hemlock stands make up the majority of the forest land. Mixed hardwood forest is also found on the property. The northeast section of the property is swampland; seasonal ponds also exist in this area. A cedar swamp is found in the southwest section. Open and old fields are found in the southeast portion of the property. Campsites are scattered throughout the western and southwestern sections.

Wildlife Management Recommendations

1) Selective hardwood cuts have taken place and can be contained. This will

promote understory development and provide wildlife cover. Scattering brush piles about will also provide beneficial wildlife cover. When discussing selective cuts in the hardwoods, camp personnel mentioned cutting dead trees and "wolf" trees. These trees provide valuable cavities that are utilized by a wide array of birds and mammals as nests, dens, and shelters. Three to seven of these snag and den trees should be left per acre. There should be a variety of sizes.

2) Making the open and old fields into pasture land is desired by camp directors. Creating an edge effect along the field borders could still be done and is valuable to wildlife. An "edge effect" produces gradual conversion from open land to forest land. Having this brushy edge is much more beneficial than an abrupt border of grassland to forest. This can be done by leaving a 10 foot wide strip of the field left uncut along the edge and by cutting trees 10 feet into the forest border allowing brushy release. The grassy edge should be cut every 2 to 3 years and the brushy edge every five years to keep it at this stage.

3) The vegetation on trails should be cut, where necessary, to open them up. This is called daylighting. The edges of the temporary ponds could also be cut back where needed to revert the brushy edge back to new growth.

4) The cedar swamp area needs improvement. The existing rubbish should be removed and a walkway built extending into the swamp. This will serve as an observation point.

RECREATION POTENTIAL

Existing Recreation Facilities and Programs

The existing recreation facilities and activities at Camp Hazen provide a well-rounded and comprehensive recreation program for its campers.

The North Campus provides facilities for traditional sports including softball, soccer, basketball, volleyball, badminton, and group games.

Cedar Lake provides opportunities for a full-range of aquatic activities including instructional and recreational swimming, sailing, canoeing, rowing, windsurfing, and fishing.

The South Campus has a double tennis court and an archery and rifle range.

Ample opportunities are available in passive types of activities including arts and crafts, drama, puppetry and in nature study and environmental awareness programs.

Outdoor adventure programs include opportunities for primitive camping, climbing, and repelling, canoe trips, and the challenge of different rope course elements.

The new horseback riding program provides a new and exciting recreational opportunity for youngsters to learn how to ride and groom and care for the animals.

Potential Recreation Facilities and Programs

South Campus

The swamp which exists in this area could provide an opportunity to expand nature study and outdoor educational experiences. Access to the area is strewn with trash and debris. Removal of this material and the construction of a boardwalk system would open new opportunities for the nature program.

Undeveloped Property

The undeveloped property being considered for future recreational use is a natural wooded area with a varied topography.

Recreational activities planned for the area should provide access to the property for the campers' use and enjoyment but of the type which will not jeopardize or destroy the natural state and beauty of this area.

The establishment of a bridle path system using part of the existing logging trails would add an exciting new dimension to the horseback riding program.

Other kinds of recreational activities conducive to the property which might be considered include: hiking and exploration, nature trails, nature study, collection and identification, primitive camping, campcraft skills, animal baiting, foot tracking, and general wildlife study.

Appendix

APPENDIX A

PUBLIC HEALTH CONCERNS

Areas of concern were the horse area and the potential move of the primitive "OSKA" outpost.

Horse Area: Manure disposal should comply with Section 19-13-B21 of the Public Health Code. With anticipated stabling of animals, more concentrated volumes of manure will be produced. In order to maintain the area free of serious fly problem, manure pile should be removed from wooded embankment at a minimum of once after each camping season or more frequently if needed to maintain sanitary conditions.

Planned expansion of barn. Stall size (10' X 10') sounds adequate. Each stall should open to paddock or central aisle,adequate in width. Provisions should be made for adequate watering, ventilation, and lighting for animals. Animals should not be fed grain on ground in garbage lids. Grain storage shall be in rodent-proof, galvanized garbage cans with tight-fitting lids.

Water fountain at barn for people must have a receiving bowl and comply with Section 19-13-B45 of the Public Health Code.

Planned clearing of approximately three acres for additional pasturage should include leaving a few trees dotted across the fields. It is understood that the camp proposes leaving a natural tree line between the existing and new pastures. However, additional trees are necessary in the field to provide shade for the animals and prevent erosion of field.

Dirt piles near well are from road sweepings. This dirt must be removed to prevent possible salt contamination of well water.

Horse trails must be cleared periodically to maintain them in adequate condition.

Primitive OSKA outpost: If primitive campsite plans to relocate, a determination must be made of extent of services and facilities provided. If water is to be supplied, it must be in compliance with Sections 19-13-B51a and 19-13-B27a of the Public Health Code. If toilet facilities are provided, they must meet Sections 19-13-B103 and 19-13-B27a of the Public Health Code.

Access trails and roads must be free of obstructions and in adequate condition for emergency transport. Location must be such that necessary and emergency information can be communicated between outpost site, main office, and infirmary.

Other points to note: Any forest improvement program conducted must be done outside the camping season. There should be no possible overlap of heavy equipment in same general area potentially used by campers and/or staff.

It is recommended that varying thicknesses of woodchips be spread in areas of the ropes course. The thicknesses would vary respective to height individual is at for a cushioning effect in the event of a fall. It is also recommended that rocks and stumps be removed in each area prior to woodchip placement. It is also recommended that tree stump in traffic area of rock-climb be removed to prevent tripping hazard.

The sewage surface discharge noted during the tour is in the process of being reviewed to come into compliance with the Public Health Code.

FORESTRY CONCERNS

This information was prepared by the State Service Forester prior to Environmental Review Team inspection of the site. As the management plan has not been fully undertaken at this time, it has been included for reference purposes.

Dept. of Environmental Protection
Cockaponset State Forest Hq.
Ranger Road
Haddam, CT 06438
May 16, 1979

Mr. Russ Gormley, Director
YMCA Camp Hazen
Route 148
Chester, CT 06412

Dear Mr. Gormley:

Most of the Camp's forest consists of sawlog-size hemlock-hardwoods, as indicated on the enclosed map. This 64-acre area may be treated as a single unit silviculturally, but might well be divided up for management purposes.

Sawtimber volume is about equally divided between hemlock and hardwoods and averages about 14,000 board feet per acre. About 40% of that volume is in trees no longer increasing in value. Trees no longer increasing in value include those which are physiologically or pathologically mature (generally, hemlock over 16 inches in diameter at breast height (d.b.h.) and hardwoods over 22 inches in d.b.h.), those which have been damaged, and those with a live crown of less than 1/3 the total tree height.

Because such a large proportion of the trees are undesirable, a harvest operation designed to regenerate the forest would be appropriate. Providing additional growing space for the best trees and cleaning out the poor trees can be accomplished in conjunction with regenerating the forest.

I suggest that the poorest 1/3 of the timber be harvested. In order to provide adequate openings in the canopy, the group shelterwood method of removing trees would be appropriate. One of the complications of the mature forest stands is that the largest trees are declining in vigor as a result of their size and age and the smaller trees are declining in vigor as a result of their being overtopped (shaded) by the largest trees. (Since most of the trees in the hemlock-hardwoods area appear to be about the same age regardless of size, whatever effects of "old-age" act on the big trees probably affect the small trees the same way.) Consequently, the decision to save or cut a particular tree should be based on tree vigor as well as tree size.

Group shelterwood means harvesting mature trees in clumps (groups) and leaving enough trees nearby to provide partial shade (shelter). Because suppressed trees may not respond to release, it is often necessary, when taking out a group of mature trees, to take out suppressed sapling and pole-sized trees as well. Exposure of mineral soil by operation of equipment during harvesting is helpful for the establishment of hemlock seedlings.

Shelterwood cutting frequently involves removing fully 1/2 of the timber in each of the two harvests spaced far enough apart (usually 10 years) to assure adequate regeneration. Because most of the forest is on an exposed ridge, losses to wind damage should be reduced by limiting the harvest to 1/3 of the trees. The amount to be cut in subsequent operations should be governed by adequacy of regeneration and apparent wind-firmness of the larger trees.

Division of the 64-acre hemlock-hardwoods area into two or three smaller units would have several advantages. Harvesting could be scheduled at different times, thus leaving part of the area undisturbed at any given time and providing an example of forest management over time. Income to the Camp would be distributed more uniformly over several years. Also, problems encountered in the first attempt at harmonizing timber production with recreation and education might be resolved before the entire area is committed.

An important aspect of successful regeneration is protection from fire. Construction of a fire access road would be appropriate and federal cost-sharing help is available to off-set this cost. A good road would also increase the market value of the timber and provide recreational benefits.

Because of the steep slopes on much of the property, erosion control measures will be important both during and following a timber harvest. Skid trails should traverse steep slopes rather than run straight up and down. Ruts should be back-bladed and waterbars installed on steep sections following the harvest.

To speed decay of topwood and improve visual appearance of the harvest, the logger could be required to log tops to four feet throughout the area.

The hardwood swamps and the mountain laurel thicket are of little recreational or educational value at the present time because of limited access. Constructing trails, particularly around the long swamp in the northeast corner of the property would be beneficial. The proximity of the swamp to evergreen cover makes it

attractive habitat for wildlife. Timber growth in the mountain laurel thicket could be improved by thinning, but the laurel is a serious impediment.

Because of the complexities and long-range implications of timber management, I suggest that a private forester be retained to act on behalf of the Camp. A representative of the Camp should accompany the forester in the woods, particularly when a timber sale is being prepared, to avoid misunderstandings. It is my understanding that you have a list of private foresters provided by the Soil Conservation Service.

A detailed management plan should be drawn up for the forest before scheduling any timber harvests. The plan should include recreation, education, wildlife, and timber management programs, drawing on professional consultants where necessary.

Please do not hesitate to call me if you have any questions. I would be happy to discuss any matters relating to forestry at the Camp with you, your staff, or the directors. I am usually in the office from 8:30 to 12:00 on Friday mornings.

Sincerely yours,

Tim Hawley, Service Forester
345-4449

About the Team

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

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

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activitis. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

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

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, and a statement identifying the specific areas of concern the Team should address. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

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