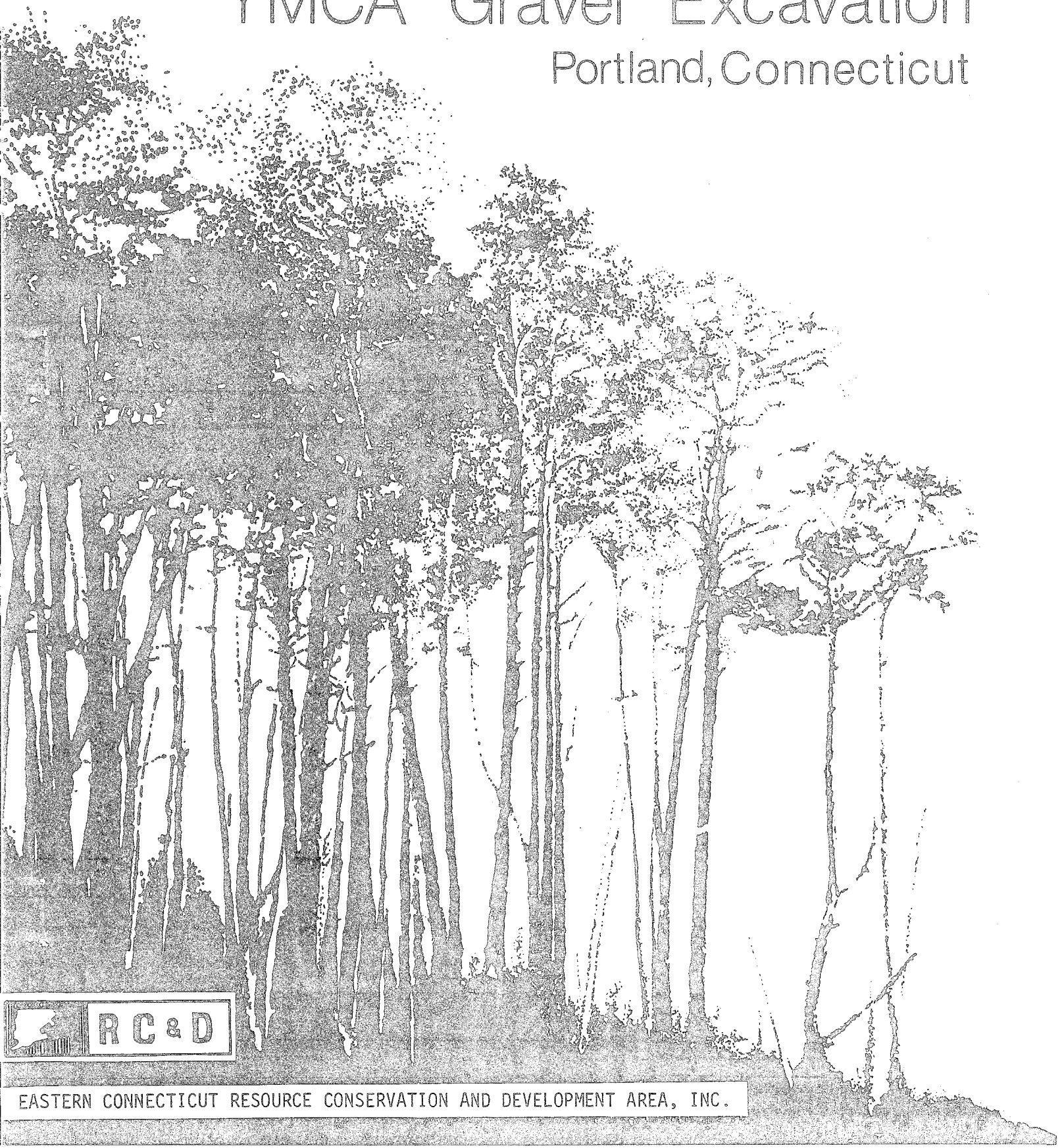
Environmental Review Team Report

YMCA Gravel Excavation

Portland, Connecticut



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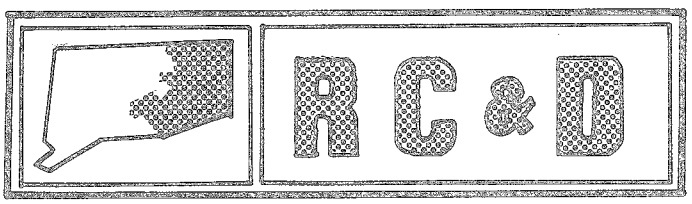
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report on YMCA Gravel Excavation Portland, Connecticut

March 1981

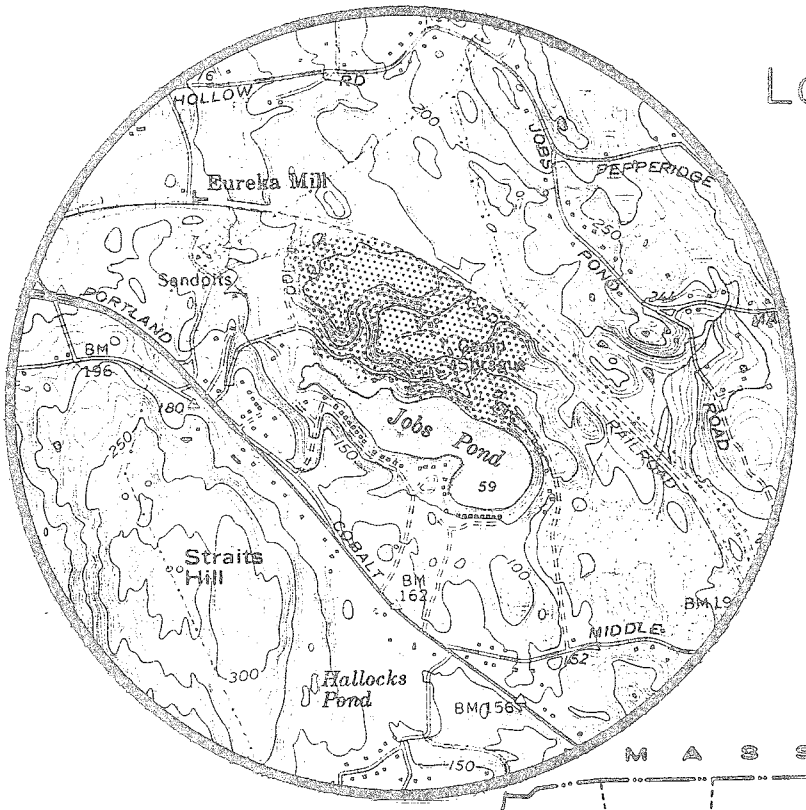


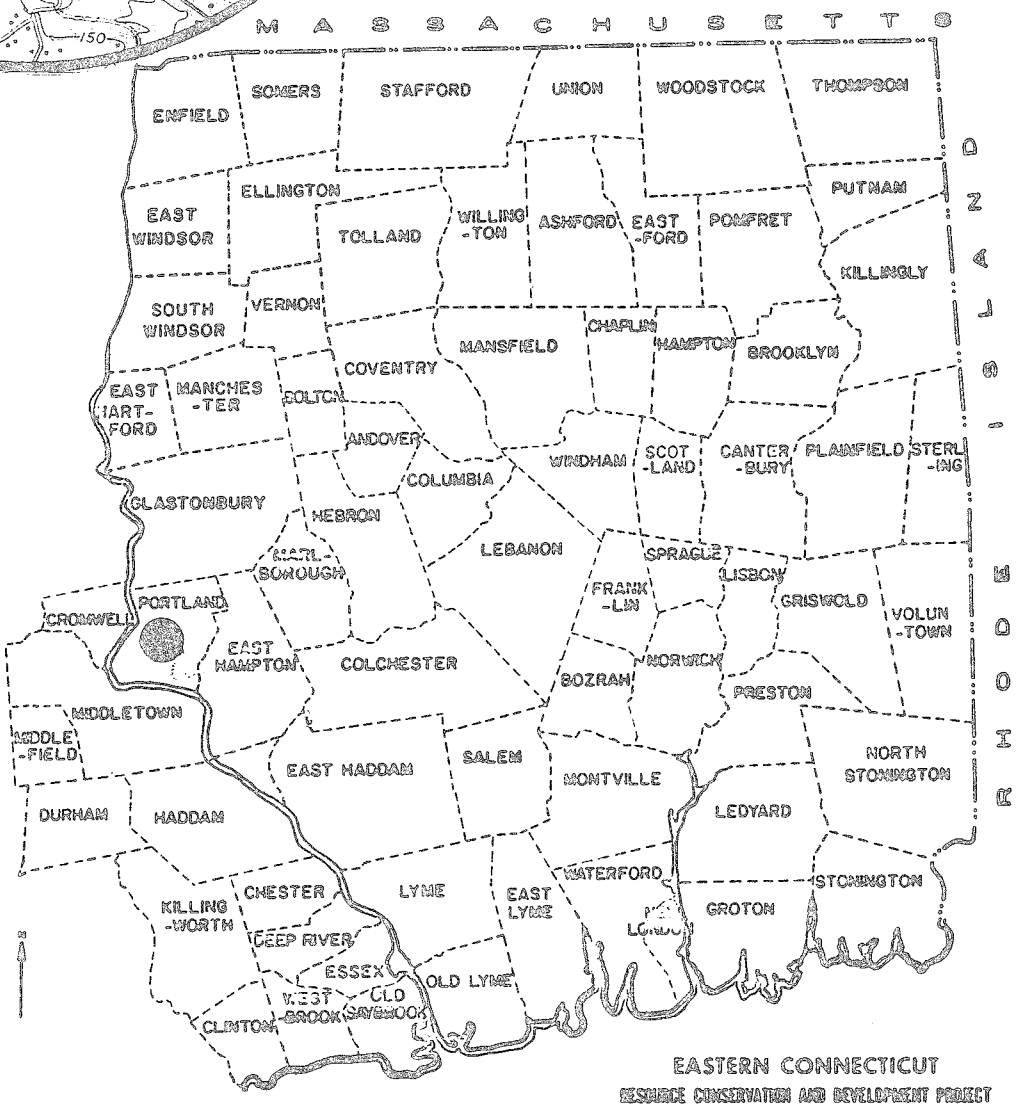
eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

YMCA GRAVEL EXCAVATION
PORTLAND, CONNECTICUT





EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
YMCA GRAVEL EXCAVATION
PORTLAND, CONNECTICUT

This report is an outgrowth of a request from the Portland Planning and Zoning Commission, 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 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.

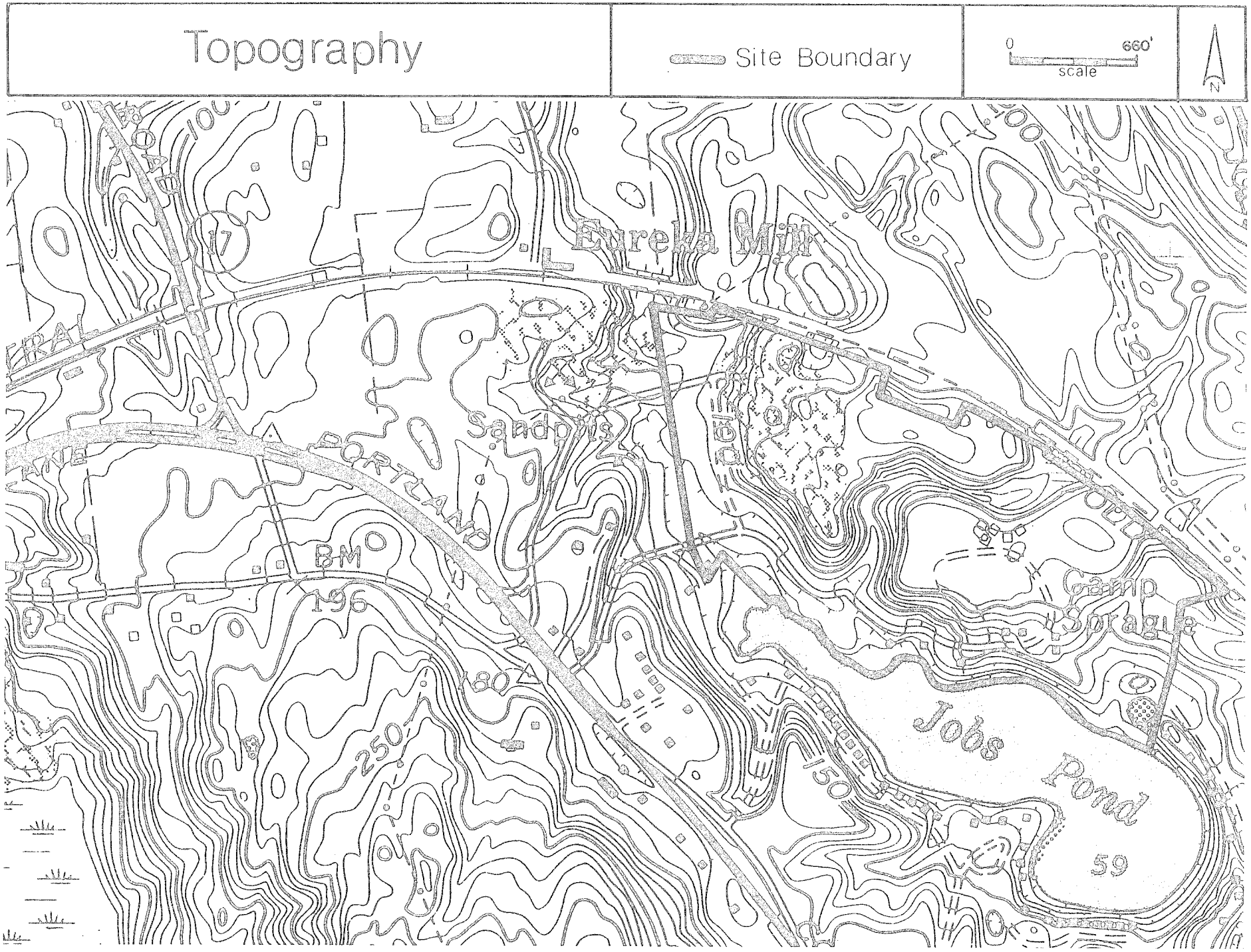
The ERT that field-checked the site consisted of the following personnel: Tom Ladny, Soil Conservationist, SCS; Mike Zizka, Geologist, Connecticut Department of Environmental Protection (DEP); Ken Major, Engineer, Water Compliance, DEP; Rob Rocks, Forester, DEP; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The team met and field-checked the site on Thursday, February 5, 1981. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Portland. 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 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, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.


Topography
Site Boundary
0
660'
scale
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Eureka Mtn
Sandpits
Camp
Sprague
Jobs
Pond
59
BM
196
250
150
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PORTLAND

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a proposed gravel excavation in the Town of Portland. The entire site is approximately 77 acres in size and is located at Camp Phelps Ingersoll on Jobes Pond and Route 66. The property is presently in the private ownership of the Northern Middlesex YMCA. David Mylchreest, P.E. has prepared preliminary engineering plans for the excavation. A long term "master plan" has been prepared by Ray Cragin Associates, to increase the Camp's efficiency and maximize its potential. Excavation of approximately 40 acres of the 77 acre site will essentially prepare the property for implementation of this master plan.

The preliminary plans indicate that the excavation will take place over a ten year period, which has been broken down into five phases. The first phase will encompass approximately six acres. A total volume of 240,000 cubic yards of earth materials will be removed from the Phase I site. A maximum volume of 1500 cubic yards per day will be removed. The excavation will eventually take on a bowl-like shape which will facilitate retention of sediment on-site.

An average of seven trucks (16-22 C.Y. capacity) will be operating at any given time. An average of seven truck loads will be removed per hour. Working hours will regularly be from 7:00 AM to 4:00 PM Monday through Friday. Operation of the excavation site on Saturday will be under emergency conditions only. All truck traffic will travel on site to an adjacent property (industrially zoned) where excavated material will be processed for marketing. Therefore, this project will generate no additional traffic on adjacent roads and highways.

As detailed plans for phases II through V were not available for Team evaluation at this time, detailed comments were made regarding Phase I, while more general comments were made about the master plan.

The Team is concerned with the effect of the proposed excavation on the natural resource base of the site. Generally, it appears that with minor clarification of sediment and erosion controls proposed, the total excavation will have little adverse effect on the site. The proposed excavation will cause increases in surface runoff, and increases in the amount of water which ultimately reaches the water table, primarily due to vegetation loss on site. However, the additional groundwater will not cause an increase of more than a few inches in Jobes Pond. The Team considers this rise insignificant given the 28 foot fluctuation known to the Pond. A slight coloring of the Pond on the stream inlet side may result from colloidal materials which escape past the proposed filter fence. This is also seen to have no adverse long term effects, as these materials will eventually settle out.

The shape of the planned excavation will aid in the containment of sediment on the site, however, it is the Team's opinion that more specific information is needed in the sediment and erosion control plan submitted for Phase I of the excavation. Items for consideration are discussed in detail in the Soils and Water Quality sections of this report, but generally deal with the timing of

erosion and sediment control installation, the actual location of some elements and the quantity of material to be used. Detailed sediment and erosion control plans will be needed for each phase of this project. This will be most important in those phases where the work road cuts through the protective berm, allowing eroded materials to run toward Jobe's Pond if protective measures are not taken.

ENVIRONMENTAL ASSESSMENT

GEOLOGY

The geology of any area may be divided into two components: bedrock and the unconsolidated earth materials that overlie bedrock. The latter component, which is called surficial geology, will be the major consideration on the camp site, considering the nature of the proposed project (gravel excavation). Bedrock may be a factor if it is tapped for water-supply purposes, but it is unlikely to influence the excavation in any other manner. In at least the higher elevations of the property, the thickness of the surficial materials is more than 70 feet. For the purposes of this review, then, it is sufficient to describe the bedrock as crystalline.

The sand and gravel that make up the surficial geology of the camp area were deposited by meltwaters flowing from wasting masses of glacial ice. Coarse particles were separated from fine particles during deposition and the resulting sediment became layered and relatively well-sorted. Meltwater-deposited sediments are generally called "stratified drift." The stratified drift at the camp is part of a band of deposits that extends from Jobe's Pond both north-northwest and south-southeast to the Connecticut River. Ice blocks and masses were in contact with and were often surrounded by sediment during the depositional process. When the ice subsequently melted completely, the sediment collapsed to form terraces with steep faces and, where blocks of ice had been buried, basins. The basins are termed "kettles." Jobe's Pond is located in a kettle.

Data supplied by Clarence Welti Associates indicate that fine to coarse sand is the principal constituent of the stratified drift on the site. Pebble gravel and cobble gravel are also common components, but they are more concentrated in the upper 20-40 feet of the deposit than they are at greater depths. The proposed excavation would lower the elevation of the central portions of the terraces by an average of roughly 50 feet (from a range of approximately 160-170 feet to a range of approximately 100-130 feet). It seems likely that very little gravel will come from the bottom 10-20 feet of the proposed excavation.

HYDROLOGY

The water resource of principal concern to the town under the proposed excavation project is Jobe's Pond, which forms most of the southern boundary of the site. The site itself contains one small manmade pond at the southeastern corner, and a stream which enters the property from the north and flows west to south through the central part of the tract. Jobe's Pond has a drainage area of approximately 590 acres; the stream drains about 210 acres. The stream reportedly dries up during most summers.

Jobe's Pond is located in a glacially-created basin (a kettle) that has no surface outlet. The pond's level at any time is, therefore, controlled by the interaction of several factors: groundwater level, evaporation, precipitation, and the transmissibility (ability to transmit groundwater) of the stratified drift surrounding the pond. The average surface elevation of the pond reportedly is 60 to 65 feet, but the level has risen as high as 78 feet and has dropped as low as 50 feet, according to Herbert Mayo, Executive Director of the Northern Middlesex Y.M.C.A. The average and maximum depths of the pond could not be determined from data available to the Team.

The proposed excavation should cause no noticeable change in the level of the pond, inasmuch as that level is primarily reflective of the local water table. The change in land use, particularly the stripping of trees from the site, will have some effect on the ability of rainfall to penetrate the soil and on the seasonal losses of ground moisture through evapotranspiration. In general, the effects would probably be to increase surface runoff, to increase the amount of water that ultimately reaches the water table, and to decrease total evapotranspiration. Data from major river basins in Connecticut indicate that the average annual amount of water that is evapotranspired is equivalent to about twenty inches of rainfall. Even if evapotranspiration from the excavated area were reduced to zero (a highly improbable if not impossible event), the additional water would not cause the level of Jobe's Pond to rise more than a few inches over what it would have been without the excavation. This is because of the distribution of rainfall throughout the year, the ability of the surficial geologic materials to store and slowly release groundwater, and the small size of the proposed excavation. Viewed in the context of the 28-foot range in pond elevations that reportedly has been experienced, a few additional inches in elevation is not significant.

The excavation should not result in any major water quality changes in the area. Sedimentation of Jobe's Pond would be the primary concern, but the berm at the edge of the excavation will keep most of the sediment on the site. Erosion-control measures will be needed where the access roads cross the parcel's central streamcourse, particularly where the finished or working slopes will be steep. Steps should also be taken to assure that sediment from the pit cannot be washed out along the access road through the breaks in the berm. Following the excavation, the water table will probably still be 20 feet or more below grade in most places. If the pit were dug to within a few feet of the water table, the possibility of groundwater contamination might be greater (e.g. from septic systems, fuel spills). This does not seem to be a potential problem with the project as proposed.

SOILS

A detailed soils map of this site is 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 feet/inch scale to 660 feet/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 for each of the soils for on-site sewerage, buildings with basements, buildings without 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 Soil Survey, Middlesex County, Connecticut, can aid in the identification and interpretation of soils and their uses on this site. Know Your Land: Natural Soil Groups for Connecticut can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

The soils involved in Phase I of the gravel excavation are identified as Manchester and a combination of Manchester and Hinckley soils. These soils are moderately steep to very steep and excessively drained. The permeability of these soils is rapid in the surface layer and subsoil, and very rapid in the substratum. Available water capacity is low. Runoff is rapid. These soils have a severe erosion hazard, and maintaining permanent plant cover helps to control erosion. Steep slopes of excavations are unstable. Lawns, shallow-rooted trees, and shrubs need watering in summer. Quickly establishing plant cover, providing termporary diversions and establishing siltation basins are suitable management practices during construction. Unlimed areas of these soils are extremely acid to medium acid. Thus, considerable amounts of lime are needed to properly establish and maintain vegetation. The site development plan thus must deal with solving three inherent problems:

1. soil which is highly erosive in nature
2. soil that is quite acid and excessively well drained. (It is a poor medium for plant growth.)
3. activity close to a stream feeding directly into Jobe's Pond

The plan submitted does address these three problems, but in a general way. For instance, haybales and diversions are to be utilized, but the plan does not specifically address where and when and quantity. The planned siltation basin is needed, but at what point will it be installed? It appears that approximately 40 feet of gravel has to be excavated before this basin can be installed. How will sediment be kept out of the stream during this part of the excavation? What erosion controls will be used, and how well will they be maintained?

In dealing with the erosive nature of the soil, excavation should be such that sediment would deposit and remain on site as much as possible, rather than reach a haybale dam or a siltation basin before being trapped. This would reduce the chances of deposition into the stream. Even as such, some deposition and discoloring of the stream may occur during heavy rainfalls. During the widening of the access road, the erosion potential is great and erosion control measures should be specifically discussed.

In solving the revegetation concern, plants should be carefully selected that will tolerate adverse growing conditions. The intended use for the completed area must be considered in choosing the proper vegetation. Even the method of revegetation should be considered. For example, hydroseeding is commonly utilized in reseeding. Jute mesh or tobacco netting is sometimes needed for controlling erosion until the seed has taken hold. It may be necessary in this project. Shrubs and trees that can tolerate acid, well-drained soils, heavy use and have a deep root system sould be considered. (See Landscape Section of this report.)

With the close proximity of the excavation area to the stream, a conscientious effort may be made to use and maintain proper sediment and erosion control measures. Excavation should start from the railroad bed to the north and work back toward the stream, being sure that surface runoff from stripped areas flows away from the stream and stays primarily on site. Small sediment catch basins along the road are effective. Keeping a ridge between the excavation area and the stream will also help. Only small areas at a time should be stripped as excavation progresses. Haybales and siltation fences should be properly constructed and maintained. This also applies to the siltation basin.

To stop erosion and deposition of sediment, suitable management practices must be installed and maintained. The site development plan submitted fails to show the planned control measures in sufficient detail.

The overall concept presented appears to be feasible and could present little or no adverse effects if proper measures are taken to insure an effective erosion and sediment control system.

WATER QUALITY

The Connecticut Department of Environmental Protection's Water Compliance Unit are responsible for the protection of the ground and surface waters of the State. Any land clearing and excavation of a site, such as proposed by Northern Middlesex YMCA in the Town of Portland, could cause drastic changes in water runoff, soil erosion, and sediment production. As a result, problems with water quality might result in neighboring lakes, ponds and streams if proper runoff, erosion and sedimentation controls are not provided in this project.

The proposed erosion and sedimentation control plans by David B. Mylchreest, P.E., are composed of the following elements: The excavation areas will be contoured into a bowl shape so that runoff will be contained; if the area becomes filled with water, they will use haybale filters and rip-rap to slow water flow out of the area to insure minimum erosion and sediment production. As the excavation approaches the stream area, a siltation basin will be used to catch any sediments which are not contained as a result of excavation procedures and the basin shall be cleaned out at 50% capacity. Since the terrain will be drastically changed, Mr. Mylchreest has proposed the establishment of a quick plant cover so as to stabilize the excavated areas. Also, a filter fabric fence will be placed in stream channel to catch any unsettled silt that may make its way toward the stream. Plans show that excavation will stop at a relatively safe distance from the stream, and the excavation depth will not reach the bottom stream channel elevation or the corresponding groundwater table level so as to insure minimal groundwater seepage into the stream.

After reviewing the Phase I proposed erosion and sedimentation control plans, the Team Engineer has made these comments and suggestions: On site surface water runoff containment through contouring excavation areas into bowl shapes should considerably reduce the possibility of any soil erosion and sediment production. A good vegetation cover should immediately be provided through all phases of excavation to stabilize slopes and preserve water quality in the area. Some expected runoff rates and siltation basin filling times have been calculated for a 100 year frequency storm (5" per six hours) and for a 5 year frequency storm (3" rain in six hours). The probability of 5 and 100 year frequency storms occurring once in their respective time periods are 20% and 1%. Data was obtained from Rainfall Intensity - Duration Curves from Stamford published by

U.S. Weather Bureau. The runoff rate and basin filling time for a 100 year storm calculated by the Team Engineer were 41,861 cubic feet/day and 30 minutes, and for the 5 year storm they were 24,625 cubic feet/day and 45 minutes. Even under the 100 year frequency storm, which is the most critical case, it is the Team Engineer's opinion that there will be sufficient settling time in the proposed basin. If sediments are allowed to build up to 50% in the basin before cleaning, the basin would still have approximately a 15 minute filling time. It should be noted that normally this area receives this magnitude of rainfall monthly, instead of just in six hours, so there is a sizeable factor of safety built into these calculations. The proposed filter fence located after the siltation basin is a good way to catch most unsettled fine silt. However, it should not be placed in stream channel as proposed, but at a distance between stream and basin. This procedure would not allow silt to enter into the stream which would most likely happen if fabric fence was put into the stream channel.

It is the Team Water Quality Engineer's opinion that if the developer follows proposed erosion and sedimentation control plans and taking into consideration suggestions outlined in this section of the report, that the first phase of this project will not damage the water quality of the Jobe's Pond or any other surrounding water course. However, there will be some slight coloring in Jobe's Pond on the stream inlet side, resulting from colloidal materials such as fine grain silt and clay which escape past the filter fabric fence. The Team does not see any serious short or long term problems resulting from such a slight amount of coloring since it will eventually settle out.

VEGETATION

The Camp Ingersoll Property may be divided into five vegetation types. These include three mixed hardwood areas ($54^{\pm}$ acres) an old field community ($1^{\pm}$ acre) and a pine/larch plantation ($1/2^{\pm}$ acre). The remaining acreage consists of a gravel excavation area and a beach area. (See Vegetation Map and Vegetation Type Descriptions). Removal of the vegetation from forty acres of this tract during phased excavation over ten years, should have no effect on the water level in Jobe's Pond.

Excavated areas should be revegetated as soon as possible to reduce accelerated erosion and degradation of the stream and Jobe's Pond. Plantings will also improve the aesthetic quality and wildlife habitat quality of the area. Trees removed in preparation of the site for gravel excavation should be used as fuelwood and, where possible, sawlogs.

Vegetation Type Descriptions

Type A. (Mixed Hardwoods) This $43^{\pm}$ acre fully-stocked stand is made up of poor quality (damaged, small crowns, poor form) black oak, scarlet oak, black birch, red maple and pignut hickory with occasional white oak, white ash, sugar maple, black cherry and American beech growing on the more steeply sloped side hills. The majority of trees in this stand are pole size, however, occasional sawtimber size trees are also present, especially on the steep slopes near Jobe's Pond. The understory in this area is made up of eastern red cedar, flowering dogwood, witch-hazel, winterberry, striped maple, tartarian honeysuckle,

Vegetation

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scale

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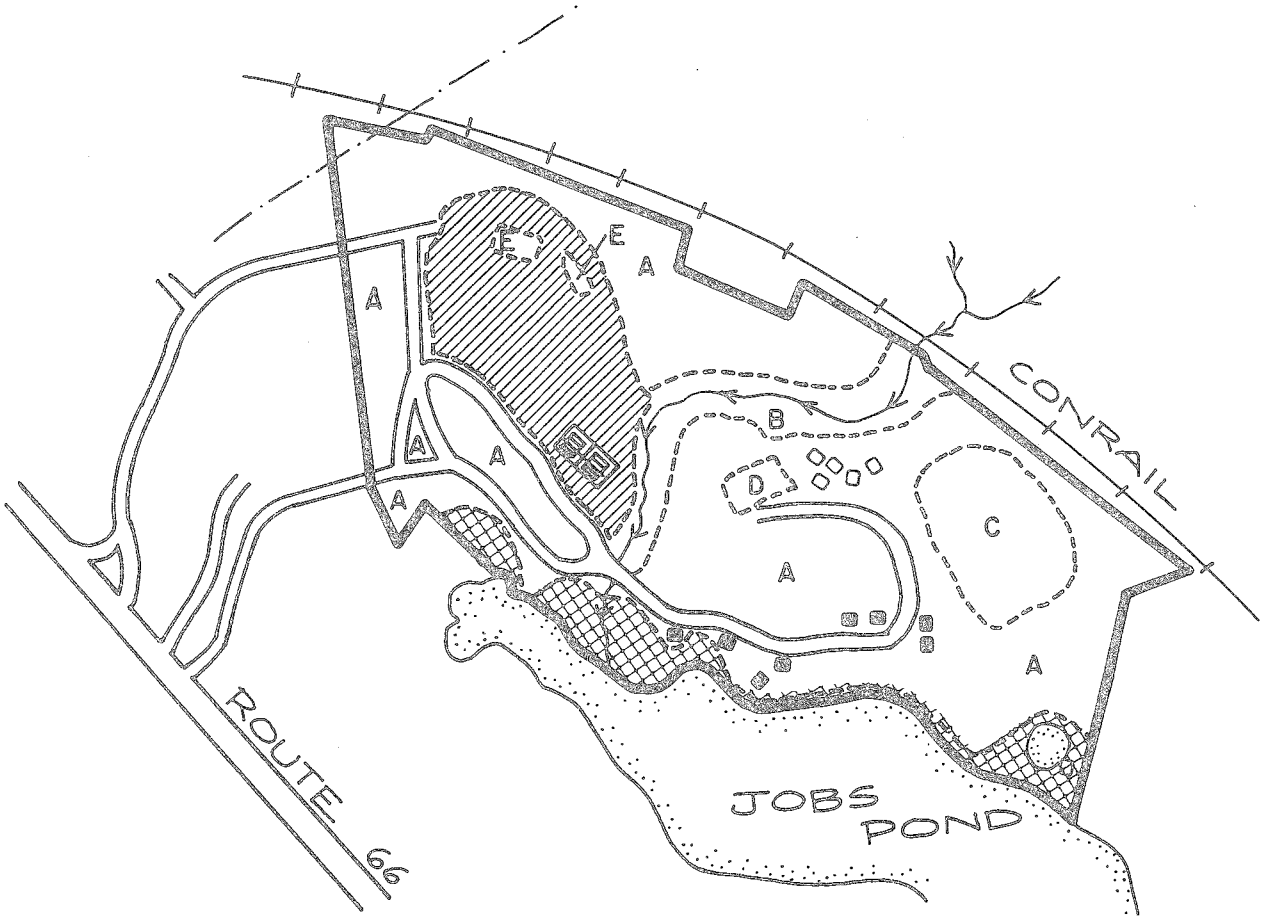


LEGEND

- Roads
- Property Boundary
- Vegetation Type Boundary
- Stream
- Structures
- Pond
- Gravel Excavation = 10 acres
- Athletic Courts
- Beach Area = 5 acres

VEGETATION TYPES*

TYPE A. Mixed hardwoods, 43± acres, fully stocked, pole-size.

TYPE B. Mixed hardwoods/stream belt, 6± acres, fully stocked, becoming crowded, sawtimber-size.

TYPE C. Mixed hardwoods, 5± acres, over stocked, sawtimber-size.

TYPE D. Old field, 1± acre, under stocked.

TYPE E. Plantation, 1/2± acre, seedling-size.

* Seedling-size = Trees less than 1 inch in diameter at 4 1/2 feet above the ground (d.b.h.)
Sapling-size = Trees 1 to 5 inches in d.b.h.
Pole-size = Trees 5 to 11 inches in d.b.h.
Sawtimber-size = Trees 11 inches and greater in d.b.h.

barberry and maple-leaf viburnum and mountain laurel. Vine species present include greenbrier, japanese honeysuckle, oriental bittersweet and fox grape. Ground cover consists of grasses, Christmas fern, poison ivy, aster, clubmoss and assorted weed and wildflower species. The total volume in this stand ranges between 14 and 18 cords per acre.

Type B. (Mixed hardwoods/ Stream belt) Medium quality sawtimber-size red maple, sugar maple, white oak, black birch, black cherry, American beech and eastern hemlock are present on the steeply sloped banks along the stream which passes through this property. The trees in this stand are somewhat crowded, however, most are reasonably healthy. The steep slopes in this area reduce the feasibility of vegetation management without disturbing the stream. Flowering dogwood, witch-hazel, spice bush and black birch seedlings form the understory in this zone. Christmas fern, evergreen wood fern, skunk cabbage, false hellebore and clubmoss are also present.

Type C. (Mixed Hardwoods) This $5^{\pm}$ acre fully to overstocked stand is made up of medium to high quality sawtimber size black oak and red oak which are mature for this site, along with small sawtimber size pignut hickory, white ash, sugar maple and black birch. The sparce understory is dominated by maple-leaf viburnum, witch-hazel and occasional hardwood tree seedlings. Ground cover is made up of Canada mayflower, Christmas fern and clubmoss. The total volume in this stand ranges between 7 and 9 thousand board feet per acre.

Type D. (Old field) This $1^{\pm}$ acre open field is vegetated by grasses, goldenrod, milkweed, gray stemmed dogwood and scattered seedling size eastern red cedar.

Type E. (Pine plantation) Approximately 1/2 acre within the $10^{\pm}$ acre area which has had the gravel removed, has been planted with eastern white pine and larch.

Removal of the vegetation from the portions of this property which are proposed for gravel excavation (approximately 2-5 acres per year for 10 years) should have no effect on the water level of the lake. Yearly clearing of the vegetation (from 2 to 5 acres) will not cause a change in the water level that would be detected above normal seasonal fluctuations. (Further discussion of this aspect is contained in the Hydrology section of this report.)

It is important that sediment and erosion controls be established and incorporated into the plan for excavation. Removal of the vegetation as proposed could cause an increase in siltation and sedimentation of the stream and ultimately the pond if proper erosion controls are not utilized.

Areas which are excavated should be revegetated as soon as the excavation stops each year. A combination of eastern white pine and larch should be established on suitable areas after excavation. These trees should be planted at a spacing of approximately 8 feet by 8 feet to 10 feet by 10 feet. These species can grow well on excessively drained soils in direct sunlight. Autumn olive could be planted 6 to 8 feet apart around the edges of this area to provide food source and cover for area birds and small mammals. Acres which will be disturbed year after year should not be planted with trees or shrubs. The steep banks which are produced by the excavation could be stabilized with grass

species as recommended by the Soil Conservation Service, which are drought tolerant and grow well in low fertility acidic soils. These plantings would reduce the chances of erosion during the winter months and also in the spring before gravel excavation resumes. (For further discussion of species suitable to this site, see the Landscape section of this report.)

The productivity of the majority of this site is limited by the excessively drained soils present. These soils dry out early in spring causing a moisture deficiency at the normal time of rapid tree growth. These moisture deficiencies reduce tree growth rates, thereby lowering the productivity of the site.

There are many high quality sawtimber-size trees in Vegetation Type C (Mixed hardwoods). These trees, because of their large size and good form, have very high aesthetic and timber value.

A thinning in this stand would be beneficial if gravel is not to be removed from this area, or is planned in one of the last phases. This thinning should remove approximately 1/3 of the total volume or about 3000 board feet per acre. It should be focused on removal of the poorest quality trees and trees which are unhealthy (small crowns, excessive damage, and poor form). The highest quality trees should be retained; these trees will benefit from the reduced competition created by the thinning. This thinning should be followed by removal of the tops to improve aesthetic conditions and for production of fuelwood. If gravel is to be removed from this area, all suitable trees should be utilized as sawlogs.

Some of the trees which are present in the heavily used areas near Jobe's Pond represent a potential hazard. Many of these trees have large dead branches or broken tops. These trees should be pruned or removed to reduce potential hazards to area users. Nails and other metal objects were observed in many of the damaged trees in the heavy use area near the pond. A public service forester or private forester could be contacted to help mark the trees which should be removed if the suggested thinning does not conflict with gravel excavation plans and is desired by the landowner.

LANDSCAPE CONSIDERATIONS

The projected final grading plan submitted to the Team for evaluation indicates a total reshaping of the plateau owned by the Camp. A cup-like depression will be created by the excavation on the hilltop and will be used to retain major portions of sediment and direct stormwater flow in the excavated area. Following excavation, the area will be regraded. Creation of substantial soil berms and terraces will serve to isolate and enhance future activity areas, create more intimate spaces, direct windflow and stormwater runoff. This planned excavation and regrading will also facilitate the installation of active recreation areas, ballfields and tennis courts, thereby allowing the Camp to expand the recreational experience offered.

Due to the extent of the excavation, it can be assumed that most vegetation will be removed from the plateau. Slopes near the lake and steep slopes near the brook will remain "untouched." No planting plans were available for Team comment. The Team suggests a reforestation program with native tree and shrub

species which can withstand the infertile and droughty soil conditions which will be prevalent following excavation. This would also provide a continuity of the plant materials on-site as vegetation on the sloped areas will not be removed. Typical species suitable to these conditions would include oak (Quercus velutina, Quercus coccinea, Quercus alba), white pine (Pinus strobus) and pitch pine (Pinus rigida). Trees should be planted in "islands" preferably on the slopes of newly created berms. Trees used on the site should also be sizable when planted (e.g. at least 2 inch caliper, measured at 6 inches above the base of the trunk), not seedling size from the State Nursery. Planting materials selected for use on site should comply with the standards set forth in the "American Nurserymen's Standards for Plant Materials." Trees once planted will need maintenance during the first year while they become established on-site.

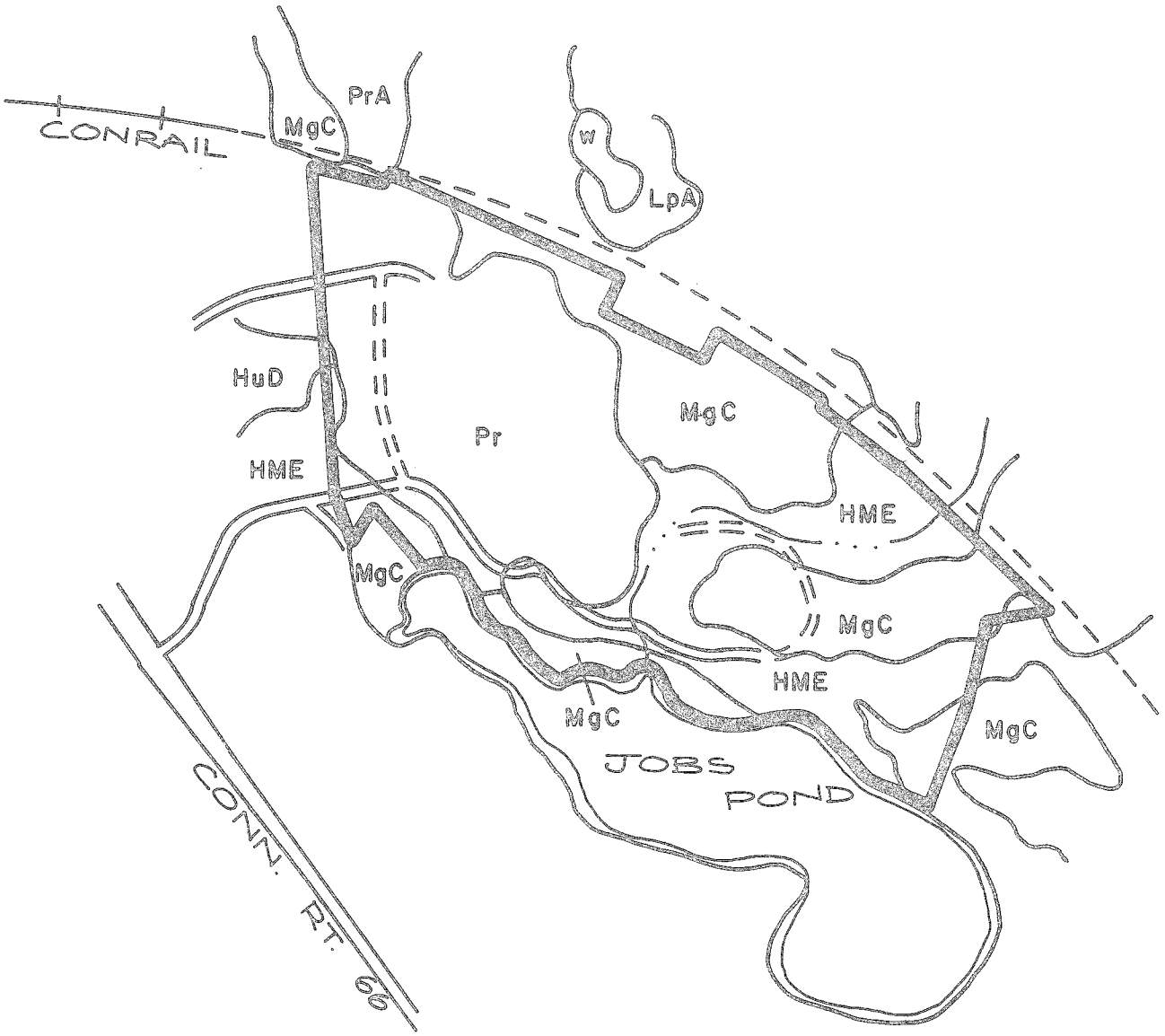
Native shrubs and ground covers should also be included in the plantings to provide future forest understory, a food source for wildlife and to allow for more effective screening of recreation areas. Species suitable to future soil conditions include high bush blueberry (Vaccinium corymbosum), huckleberry (Gaylussaccia baccata), Mountain Laurel (Kalmia latifolia) shining sumac (Rhus copallina), fragrant sumac (Rhus aromatica), nannyberry (Viburnum lentago), sweet fern (Comptonia peregrina) and bayberry (Myrica pensylvanica). Also suitable although they are not native species are Japanese holly (Ilex crenata convexa), Pfitzer Juniper (Juniperus chinensis pfitzeriana) and drooping leucothoe (Leucothoe catesbaei).

Groundcover on the site can be approached in three directions, hydro-seeding with a grass mixture, planting low growing shrubby species or a combination of the two. Hydro-seeding is a fast and easy approach to establishing groundcover on open areas. Grass mixtures can be used, or a more innovative approach - a native grass and wildflower mixture. Addition of wildflower seed to the mix is more costly, but well worth the expense from the aesthetic standpoint. Shrub seed could also be added to the mix, allowing them to establish themselves while the area is still in the "open field" stage of development. This type of naturalistic approach to groundcover on-site will reduce long-term maintenance costs. It can also be used as a species teaching tool for children attending the camp. It will also be favorable as a future food (seed) source for wildlife. Species suitable for this seed mix would include : red top grass (Agrostis alba), little blue-stem (Andropogon scoparius), Pennsylvania sedge (Carex pensylvanica), butterfly weed (Asclepias tuberosa), asters (Aster spp.), goldenrod (Solidago spp.), black-eyed Susan (Rudbeckia hirta). Low growing "shrubby" groundcovers suitable to the site include spring heath (Erica carnea), bearberry (Arctostaphylos uva-ursi) and low bush blueberry (Vaccinium angustifolium).

If turf grass is to be established on new playing fields or open activity fields, the Team suggests the use of sod. It is quickly established and extremely durable. Droughty conditions may not allow for rapid and easy establishment of turf grass by seed. Seeded grasses may also not stand up to constant abuse by field users if not constantly and consistently maintained. Fields used for active team sports will need maintenance (i.e. watering) throughout the summer season, due to the droughty nature of the soils on site.

Appendix

Soils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GRAVEL EXCAVATION
PORTLAND, CONNECTICUT

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
					On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
Hinckley-Manchester	HME	25	31%	Slope	3	3	3	3
Manchester	MgC	25	31%	Slope, droughtiness	2	2	2	3
Pits	Pr	31	38%	Limitations Determined on Site				

Limitations: 1 = slight, 2 = moderate, 3 = severe.

SOIL INTERPRETATIONS FOR URBAN USES

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

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

Slight Limitations

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

Moderate Limitations

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

Severe Limitations

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

About the Team

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

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

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use 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 (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.