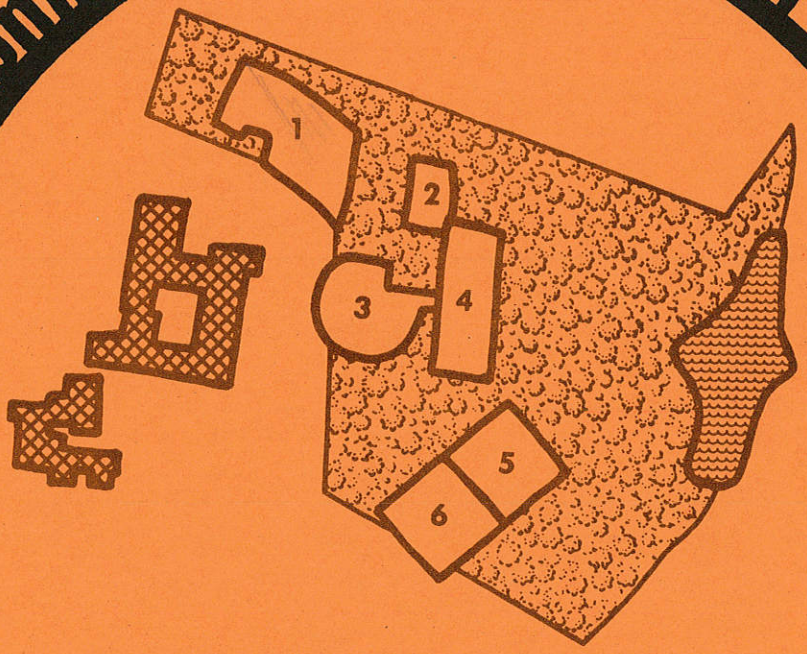
Dodge

environmental review team report



PROPOSED HIGH SCHOOL

Old Lyme, Connecticut

RC&D

EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE,
SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES

ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
PROPOSED HIGH SCHOOL
OLD LYME, CONNECTICUT

JANUARY, 1975

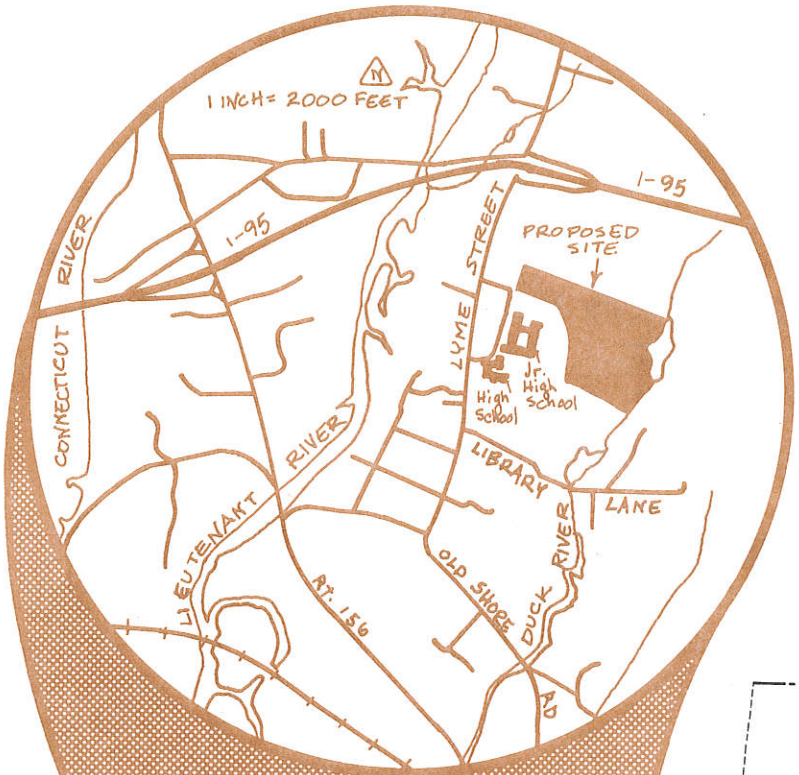
Preparation of this report has been, in part, assisted by a grant from the U.S. Economic Development Administration with the financial support of the Regional Planning Agencies of Eastern Connecticut administered by the Eastern Connecticut Development Council.

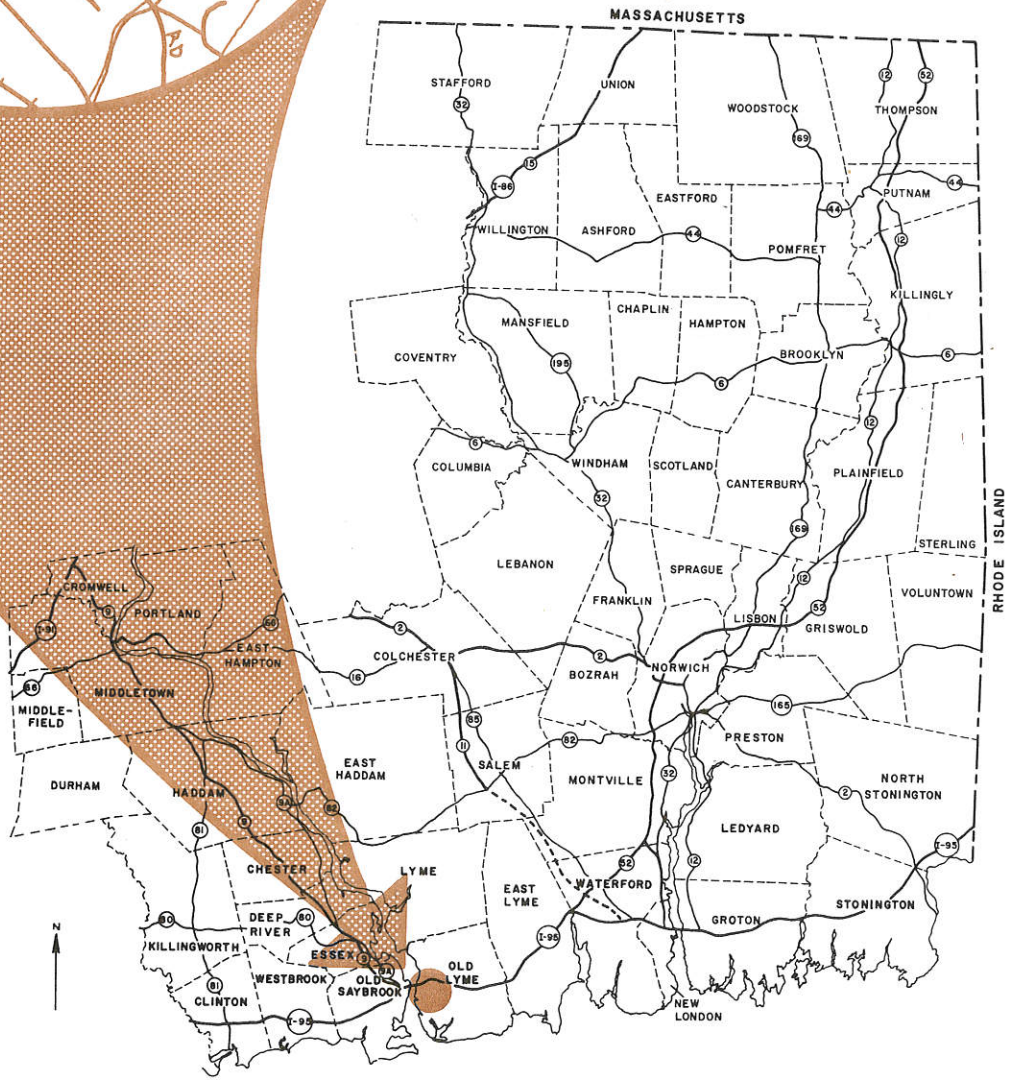
EASTERN CONNECTICUT RESOURCE CONSERVATION
AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

PROPOSED HIGH SCHOOL

OLD LYME
CONNECTICUT





EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
PROPOSED HIGH SCHOOL
OLD LYME, CONNECTICUT

This report is an outgrowth of a request from the Old Lyme Conservation Commission, with the approval of the landowners, 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) Project Executive Council for their consideration and approval as a project measure. The request has been approved and the measure reviewed by the Environmental Review Team.

The soils of the site were mapped by a soil scientist of the USDA Soil Conservation Service. Reproductions of the soil survey and a table of limitations for urban development were forwarded to all members of the Team prior to their review of the site.

The Team that reviewed the proposed development consisted of the following personnel: Sherman Chase, District Conservationist, Soil Conservation Service (SCS); Dwight Southwick, Civil Engineer, SCS; Timothy Dodge, Biologist, SCS; Richard Hyde, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); Donald Capellaro, Principal Sanitarian, State of Connecticut Department of Health; Ed Meehan, Planner, Connecticut River Estuary Regional Planning Agency; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on December 19, 1974. Reports from each Team member were sent to the Team Coordinator for review and summarization.

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 Town of Old Lyme. 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 Council 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: Miss Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

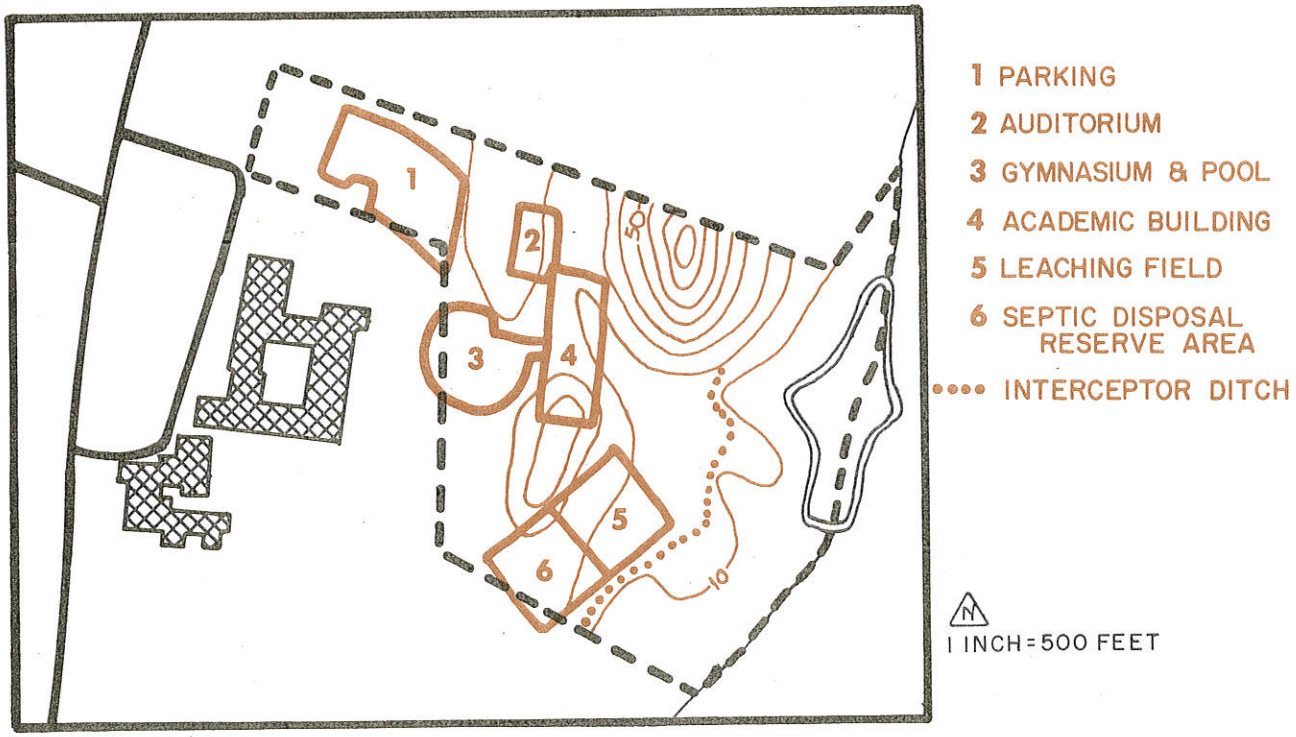
INTRODUCTION

Regional School District #18, consisting of the towns of Lyme and Old Lyme, are proposing to construct a new high school behind the existing junior-senior high school on Lyme Street in Old Lyme. The school would have an initial capacity of 600 students, with a full capacity of 1,200. The site is located between the existing school buildings and Duck River. The main features of the open and wooded property are the bedrock ridge, the lower wet terrain along Duck River, and the former gravel pit area. The basic elements of the proposed site plan are shown on the map below.

In accordance with the Inland Wetlands Act, the Regional School District has submitted an application to the Conservation Commission showing their plans for protection of the Duck River and its associated wetlands. It was in conjunction with this application that the environmental review was requested. However, in reviewing the site, the Team has also considered other aspects of the project as well.

The report includes a description of the site, including a more detailed delineation of the inland wetland soils, and an evaluation of the various aspects of the project with respect to the existing resources. Recommendations or comments made within this report are presented for consideration by the architects and the town in the preparation and review of the plans and should not be viewed as mandatory or regulatory in nature.

SITE PLAN



EVALUATION

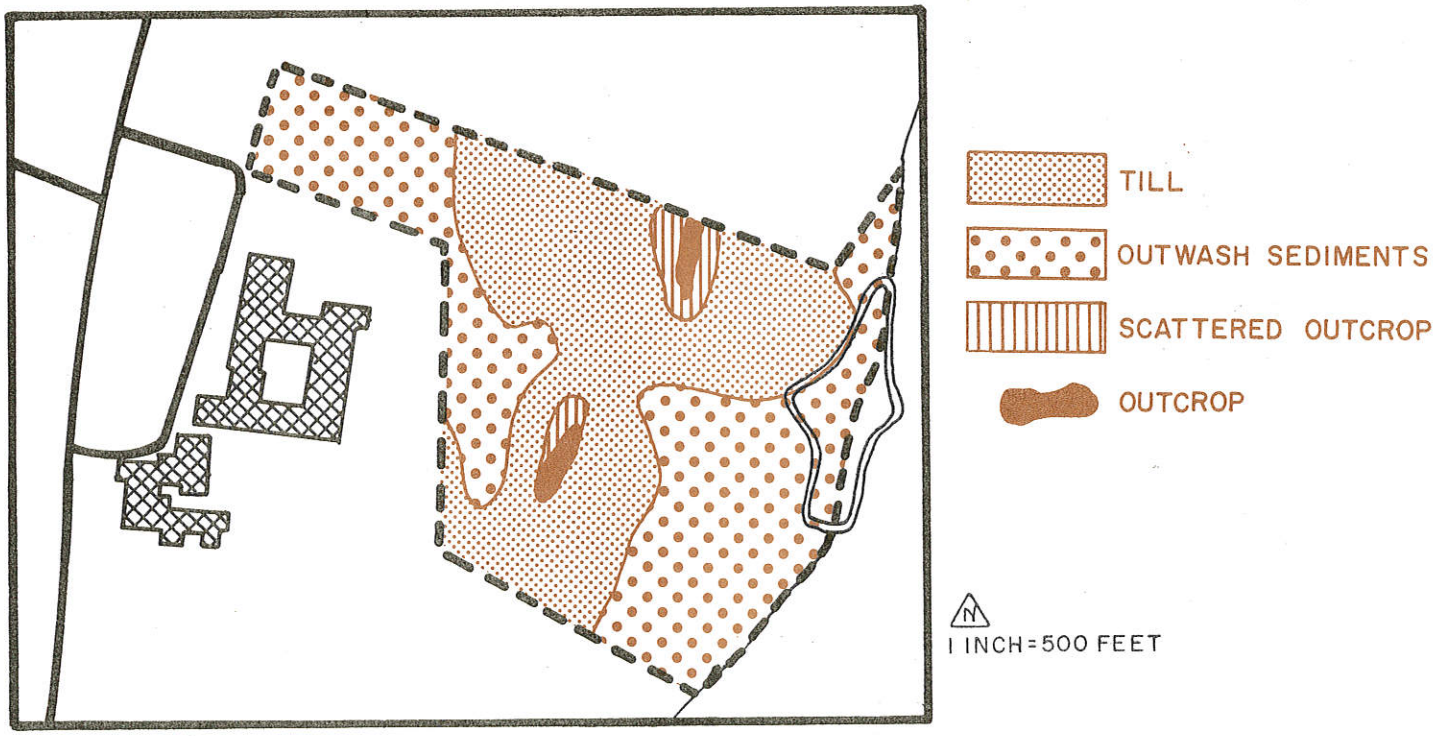
SITE DESCRIPTION

Bedrock Geology. The proposed school site exhibits a varied topography, due largely to the knobby rock spine crossing the property in a northeast by southwest direction. The rock is formed by granitic units of the Sterling Plutonic Group and consists of coarse and medium grained minerals (Bedrock Geology of Old Lyme Quadrangle, QR-21, 1967). The rocks are exposed at the land surface at the tops of the small elliptical hills (see outcrops on Surficial Geology map below).

The bedrock appears to be well fractured, at least at the land surface. This would seem to be confirmed by the apparent ease of outcrop removal when the existing ball field along Duck River was constructed. Well-fractured rocks tend to be capable of transmitting large quantities of water if there is a place for the water to go.

Surficial Geology. The task of the surficial geologist is to map the distribution of unconsolidated overburden materials lying between the solid bedrock and the soil zone of the land surface. These materials are called primary overburden and in Connecticut they were deposited by the glacier approximately 10,000 years ago. The soil zone which is mapped by the soil scientist is that uppermost portion of primary overburden which has been altered by biologic as well as natural, mechanical, and chemical weathering processes.

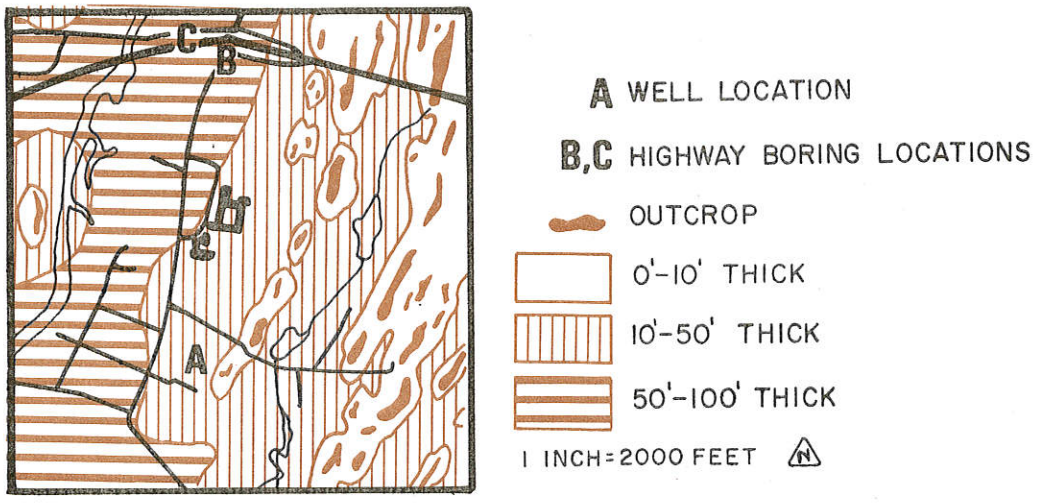
SURFICIAL GEOLOGY



As shown on the map on the previous page, two distinct types of primary surficial deposits have been identified on this site, till and outwash sediments (Old Lyme Quadrangle, QR-31). Till is the predominant type of overburden found in Connecticut. In this particular area, it is restricted to the string of bedrock knobs running in a southwesterly line behind the present high school. Till is the geologist's word for such lay terms as "hardpan" and "boulder clay." Characteristically its makeup is that of a fairly compact heterogeneous mixture of varying quantities of boulders, gravel, silt, and clay, with little or no sorting or stratification of the constituents by grain size. It is the material carried on or within the glacier that remained where the moving glacier stopped once all the ice had melted. The thickness of this material is fairly thin on this particular site, ranging from 0 to 10 feet, with an average thickness of 3 to 5 feet.

Moving away from the rocky knob areas, the overburden changes to outwash sediments. Such deposits are chiefly composed of sand and gravel which were originally brought in by the glacier as till. As the ice melted it was carried and placed beyond the front of the glacial ice by meltwater streams. Outwash sediments are always stratified and sorted in layers with the more coarse materials being deposited nearest to the location of the active ice mass. The thickness of these deposits increases dramatically to the west of the bedrock knobs, as shown on the Depth to Bedrock map below. From information on a domestic well (A) and two State Highway borings for I-95 (B and C), it appears that outwash deposits are anywhere from ten feet to forty feet. (Logs of the highway borings are in the Appendix to this report.)

DEPTH TO BEDROCK



Soils. A detailed soils map of the parcel is given in the Appendix to this report along with a soils limitations chart. Due to the original scale at which the soils are mapped (1"=1,320') the lines shown on the soils map should not be viewed as precise boundaries, but rather as guidelines to the distribution of soil types on the property. The soils limitations chart indicates the probable limitations for each of the soils for on-site sewage disposal, basements, landscaping, streets and parking, and athletic fields. However, limitations, even though severe, do not always preclude the use of the land for development. If economics permit greater expenditures for land development and the intended use is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used.

The soils on the site can be grouped into 3 general categories: excessively and moderately well drained terrace soils over sand and gravel; upland till soils, shallow to bedrock; and inland wetlands. The terrace soils (67B, 70A, 20BC) are underlain by water-deposited beds of sand and gravel (outwash sediments). In most places a few inches to 3 feet of loamy or fine sandy material cover the older, coarser water deposits. The droughtiness of the excessively drained soils makes it difficult to establish vegetation once exposed.

The upland till soils (17LC, 17LD, 73MD, 200C) are located along the small, elliptical hills. The soils are underlain by hard bedrock and the areas contain barren rock outcrops. In most places, hard rock is less than 20 inches below the soil surface. These areas provide contrast in the landscape and scenic overlooks.

The third group are the inland wetlands soils (92, 291, 464, 466). These are all poorly or very poorly drained soils which fall under the jurisdiction of the Inland Wetlands Act. As can be seen on the soils map, this includes areas not shown on the Old Lyme inland wetlands map (page 9 of the application).

Vegetation and Wildlife. The Duck River is not listed by the Connecticut Department of Environmental Protection as a stocked stream and it is doubtful that any sport fishery exists above the tidal influence. What probably does exist, though, is a resource composed of various species of minnows.

The ice house pond, which Duck River flows through, has filled with sediment over the years to a point where it is now technically an inland, deep, fresh water marsh. At this point, its value is to furbearers and waterfowl rather than to fish. Submerged rooted aquatic plants and possibly emergents characterize its vegetation. Surrounding the pond, shrubs include alder, red maple, silky dogwood, and pussy willow. Mallards, black ducks, and muskrats may use this area for feeding and resting.

The site is basically one of old fields reverting back to woodland. This provides a mixture of woodland and openland habitat to wildlife. At the present time, there is an abundant variety of hardwood trees, shrubs, vines, weedy growth, and grasses, which provide wildlife with a diversity of food and cover. Tree growth includes red maple, white oak, white pine, wild cherry, gray birch, locust, apple, and cedar. The shrubby understory, which in places is deep, includes green briar, multiflora rose, blueberry, honeysuckle, briars, mountain laurel, as well as ground pine in more moist locations. Grasses are primarily wild species with short and tall varieties of bluestem dominating. Habitat is provided for animals such as cottontail rabbits, raccoon, skunk, opposum, tree and ground squirrels, numerous songbirds, woodpeckers, woodcock, and ruffed grouse.

Much of this area has a southerly and easterly exposure. Growth is advanced and the change from openland to woodland will be relatively rapid. This type of habitat is of a transitory nature and as succession continues, the diversity of vegetation will decrease. As understory plants are shaded out, much of the vegetation with highest values to wildlife will be decreased.

Land Use. Many of the comments regarding land use planning have already been brought to the attention of the school district. Decisions relating to town planning have been tentatively made. These include location (pending approval of wetlands permit and final negotiation of option), size of structure, vehicle access, recreation areas, and public services.

Being adjacent to the existing school facilities should not create any problems of compatibility. On the Old Lyme Plan of Development, adopted in 1965, the area is shown as a school expansion site and open space. Thus the proposal appears to be in line with the community's thinking.

WATER SUPPLY

Discussions during the prereview indicated that the proposal will include a bedrock well, to be drilled on or in close proximity to the large bedrock outcrop in the northcentral portion of the site. With the amount of land available, there should be no particular problem in locating a well site which would afford proper protection of the supply from any potential sources of contamination. The main concern would be to obtain a sufficient quantity of water of suitable quality to supply the needs of the school. Bedrock wells in the eastern and western Connecticut uplands are generally low yielding water supplies capable of accommodating, on the average, only the needs of single family dwellings. Naturally there are exceptions, such as in areas where the bedrock exhibits extensive fracturing and thus is capable of transmitting larger quantities of water to drilled wells. It may be possible to check the reported yields of bedrock wells for the surrounding neighborhood from the well drillers' well completion reports and thereby get a general idea of yields that can be expected on this site. The one domestic well encountered (A on Depth to Bedrock Map), reported bedrock at 32 feet and a water yield of two gallons per minute. This is a fairly low figure when you consider that the existing school's gravel packed well, as indicated at the prereview meeting, supplies approximately 75 gallons per minute.

On the basis of the highway boring and domestic well data and the gravel packed water supply well being utilized by the existing schools, it would seem that having adequate supplies of water for the new school should not be a problem if a gravel packed well were to be used. This is particularly true if a gravel packed well is placed in the thick, coarse grained outwash sediments found west of the bedrock spine. However, exact placement of such a well would require consideration of the septic systems utilized by the existing schools and surrounding properties, property boundaries, and the proposed facilities for the new school.

Another alternative is to place a gravel packed well within the outwash sediments to the east of the bedrock spine. This would probably require some exploratory test borings to find a location as far north of the proposed primary septic leaching system as possible. If the site for the septic system was shifted to the

south, thus using the existing ball field for the reserve area, a more than adequate water supply system could be developed in the area bound by the old ice pond and the proposed school building.

It was also indicated that the water supply for the existing schools has considerable volume, and that if necessary, this supply might also be utilized for all or part of the proposed school's needs. Before any definite conclusions are made, accurate information as to the safe yield of the well should be determined. The water system, in addition to having an adequate supply for the daily consumption, needs to provide sufficient volume during periods of peak demand.

In the long term, public water will probably be available to the high school. Both the 1965 Town Plan of Development and a recent water supply study* anticipate and propose the eventual construction of water lines to service the village and high school site.

WASTE DISPOSAL

Waste disposal will be by means of a subsurface sewage disposal system (approximate location of leaching fields is shown on Site Plan, page 4). Although half of the site has adverse factors which impose severe restrictions for sewage disposal purposes, there is a section of the property which appears suitable for this use. The area is located on the southeastern side of the property west of the pond and Duck River. Visual observations, detailed soil survey information (soil 20BC), and a previous investigation by the state and local health departments (May 1974) indicate the soil to be well drained, consisting mostly of sandy material.

While some filling and regrading of that portion where sand and/or gravel has been excavated will be needed, there does not appear to be a problem with high ground water or maintaining more than the required separating distance from the pond, stream, and wetland areas. From the layout of these leaching fields that was shown to the team, no serious problems with grading and installation are expected. The trenches installed on the fills would probably cave in easily. Due to the terrain it appears that precautionary measures should be taken during the course of grading and installing the sewage system to protect the waterway from possible surface runoff and ensuing siltation.

Suitable treatment or other provisions should be provided for the handling and disposal of toxic or hazardous chemicals, or materials that may be employed in laboratory studies.

No public sewers are available and none are anticipated prior to 1980. However, both the Town Plan and the Regional Plan recognize that existing land use densities will probably necessitate public sewer service in the village at some point in the future.

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* Feasibility Study of the Establishment of a Municipal Water Supply and Distribution System in the Town of Old Lyme, February 1972, Fenton G. Keyes, Providence, R.I.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

Erosion and sediment control. The main concern in developing this site appears to be the protection of Duck River, the pond, and the associated wetlands. There are additional wetland soils on the site which will also require special attention during site preparation if problems are to be avoided with building foundations and roads.

Erosion and sediment control plans have been included in the wetlands application. The idea on the plans is to construct or place sediment traps at several locations along the interceptor ditch (see location on Site Plan on page 4). It has been suggested that constructing a designed silt trap (sediment basin) in the main drainage way would be more effective and need less maintenance than the baled hay erosion checks. The interceptor ditch would outlet into the silt trap. Its location, as shown in the inland wetlands application, is strategically located and should prove effective. If construction permits, it is suggested that the grade in the ditch be no steeper than a one foot drop in a hundred feet (1% grade). The use of baled hay erosion checks within the interceptor ditch could be useful in reducing the velocity of runoff into the silt trap and in removing some of the sediments. With any erosion control practice, proper maintenance is necessary for the measure to be effective.

Other factors will also affect the potential for erosion on the site. Timing of construction can be a very effective form of erosion control. For this reason, it is suggested that the septic disposal area be installed and stabilized prior to construction of the school buildings. It was noted on the review that this type of scheduling would probably be implemented since the main access to the septic disposal area would be blocked by the actual school construction.

The septic disposal area should be seeded with either temporary or permanent seedings when completed. The soils are droughty and topsoil should be spread on the surface to allow proper vegetation to be established. Seedings or mulching can be used to stabilize any disturbed areas that would otherwise be left bare during the construction phase.

The application calls for leaving some of the area in natural vegetation. It is felt that this is good planning. Planting thick grasses, such as reeds and canary grass, along the moist border of the swale would create an additional barrier to trap sediment movement, both during and following construction.

The interceptor ditch may be removed after construction is completed and the area stabilized. However, the silt trap could be left as a permanent fixture and maintained if desired. Since the storm drainage system will outlet into the main drainage way, the silt trap would help remove remaining sediments and reduce the velocity before the water reaches the pond and river.

Foundations. The foundations of the buildings are to be constructed on both fill and undisturbed soil. This presents a problem of possible differential settlement, which could cause cracks in the foundations, walls, and floors. This situation can be minimized by proper compaction in the fill areas to insure a uniform and sufficient bearing strength for the parts of the buildings involved.

Grading. The areas of cuts and fills should be constructed to stable slopes for the soils involved and flat enough to be mowed, seeded, etc. Some of the cuts will need interceptor tiles to prevent the slopes from seeping ground water and becoming unstable.

ROADS AND UTILITIES

The plans for a parking lot in the northwest end of the property involves a wetland area. The parking lot would be constructed on fill, but care should be taken to prevent frost heaves or settling. The stumps and organic material should be removed prior to filling so that the fill can be properly compacted.

Access to the site is planned via a single entry and exit onto Lyme Street, through the existing high school access. Lyme Street relates well to other main thoroughfares and should prove to be a convenient access to the proposed District school population. The planned access road will not be used as a public street and its primary purpose will be to service the high school. Functionally, a single access road for school purposes only should provide more safety for students using the school grounds.

The location of the buildings and the bedrock hills appears to close off the area of the leaching fields and planned athletic fields from vehicular traffic. Access is planned for maintenance traffic. This should be planned to allow for repair or maintenance equipment of the drainage, septic, and athletic facilities. Actual construction of the facilities, as mentioned before, would be best completed prior to the school construction.

POTENTIAL HAZARDS

The greatest potential hazard on the site is erosion. However, the present plans along with the suggestions made earlier in this report should minimize the dangers.

In developing the site, a carefully designed drainage system will be necessary. The auditorium and classroom building will block a natural drainage way and the parking lot will encroach further upon another wetland area. Drainage from the surrounding hills will also need to be controlled in the vicinity of the buildings.

The possibility of oil pollution from the roads and parking lots was discussed. The plans call for the use and maintenance of oil-separator catch basins. These will reduce much of the danger from the oil. Maintenance of these structures cannot be overstressed and a regular schedule should be set up.

AESTHETICS AND PRESERVATION

Clearing land for the construction of school buildings will remove land which presently provides woodland wildlife habitat. The proposed building area is not

unique and is typical of Old Lyme's rough terrain, with moderate to severe limitations or intensive development. However, it does involve an inland wetland and consideration should be given to this fact.

Replanting the area with grasses and shrubs following construction will probably cause a shift from larger animals toward songbird habitat. This is an inevitable change adjacent to any development. Consideration should be given in the planning stages to the use of fruiting shrubs and vines for landscaping which would benefit wildlife. Any selective clearing or planting which can provide "finger or edge" vegetation to benefit wildlife should be considered (example: between buildings and athletic fields).

The plans to avoid clearing any vegetation in the major wetland areas and in the swale which surrounds it will aid in the protection of Duck River while providing for wildlife at the same time.

The varied topography and vegetation together with the pond and Duck River lend themselves well to outdoor classroom activities and nature study. Consideration could also be given to possible winter use of the pond (e.g. skating). Some rebuilding of the dam might be necessary. These areas and opportunities could be included in the plans for development.

SERVICES TO SUPPORT DEVELOPMENT

On-site water supply and waste disposal systems will be developed. Electricity is available and will preferably be brought to the site underground. Other services, such as fire protection and solid waste disposal, are adequate.

It was noted on the plans that there is a considerable distance from the parking lot to the auditorium and gym. If these are to be used for community events, some provisions should be made for handicapped and elderly individuals.

COMPATIBILITY OF SURROUNDING LAND USES

The proposed school site is compatible with surrounding development. The adjacent schools present an opportunity for an integrated educational complex. There are also cost advantages of sharing recreational and other facilities.

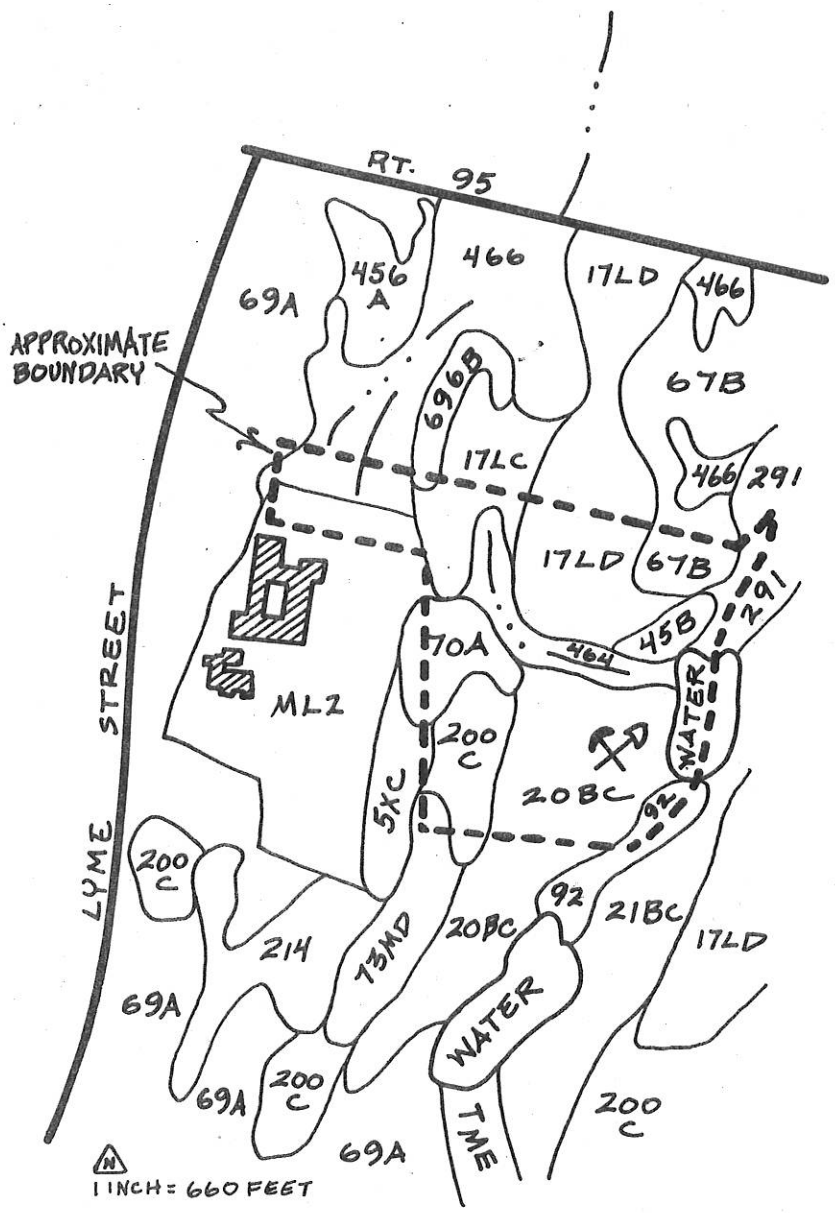
ALTERNATIVE LAND USES FOR AREA

From a planning viewpoint the high school complex, with the incorporation of open space areas, should receive priority as the best use of this land area.

APPENDIX

SOIL MAP

PROPOSED HIGH SCHOOL
LYME STREET
OLD LYME, CONNECTICUT



Prepared by: UNITED STATES DEPARTMENT
OF AGRICULTURE,
Soil Conservation Service

ADVANCE COPY, SUBJECT TO CHANGE *NOVEMBER, 1974*

SOIL LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Acres	% of Total	Limitations For:** On-Site Sewage	Basements	Landscaping	Streets and Parking	Athletic fields	Principal Limiting Factors(s)
A-1a	67B,70A	3.5	11.5	1	1	2	1	2	Droughtiness.
A-1b	20BC	7.0	23.0	2	1	2	2	3	Slope, droughtiness, texture.
A-2	45B	1.0	3.3	2	2	2	2	2	Seasonal high water table.
A-3a+	464,466	5.0	16.4	3	3	3	3	3	High water table.
D-1	17LC,200C	4.7	15.4	3	3	3	3	3	Shallowness, slope 3-15%.
D-2	17LD,73MD	4.8	15.7	3	3	3	3	3	Shallowness, slope over 15%.
F-1+	92	.5	1.6	3	3	3	3	3	High water table, organic material.
G-3b+	291	1.0	3.3	3	3	3	3	3	High water table, organic material.
	Water	1.0	3.3	Unclassified					
	ML-2	2.0	6.5	Unclassified					
		30.5	100.0						

* Refer to Know Your Land, Natural Soil Groups For Connecticut, Soil Conservation Service, USDA Connecticut Cooperative Extension Service, for further explanation of the natural soil groups.

** Limitations: 1-slight; 2-moderate; 3-severe.

\+ Inland wetland soils. Total of 6.5 acres or 21.3% of site.

SUMMARY OF LIMITATIONS

	Slight		Moderate		Severe	
	Acres	%	Acres	%	Acres	%
On-Site Sewage	3.5	11.5	8.0	26.3	16.0	52.4
Basements	10.5	34.5	1.0	3.3	16.0	52.4
Landscaping	-	-	11.5	37.8	16.0	52.4
Streets & Parking	3.5	11.5	8.0	26.3	16.0	52.4
Athletic Fields	-	-	4.5	14.8	23.0	75.4

LOGS OF HIGHWAY BORINGS

(Location of Borings on Depth to Bedrock Map, Page 7)

BORING B:

Material	Feet From Land Surface
Topsoil, loam	0 to 0.6
Sand and silt	0.6 to 2.0
Gravel	2.0 to 5.0
Sand, medium, trace silt	5.0 to 10.5
Gravel and sand, some silt	10.5 to 26.0
Sand, coarse	26.0 to 28.0
Gravel and sand, some silt	28.0 to 68.0
Rock, soft	68.0

BORING C:

Material	Feet From Land Surface
Mud	0 to 6.0
Mud and clay	6.0 to 20.0
Sand, some clay, gray	20.0 to 30.0
Sand, some clay, brown	30.0 to 71.0
Rock, soft	71.0