

POTENTIAL SCHOOL SITES

COLUMBIA, CONNECTICUT

APRIL 1989

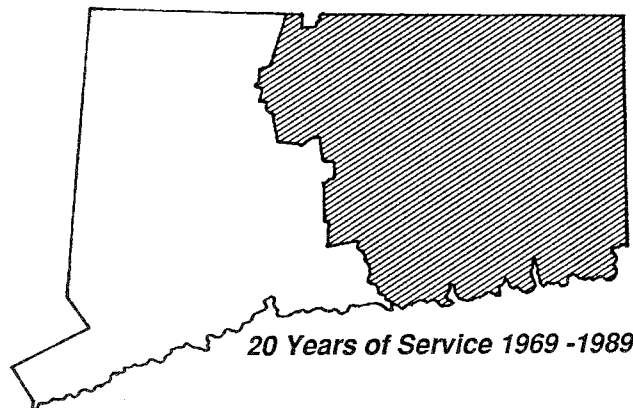
**EASTERN CONNECTICUT
ENVIRONMENTAL
REVIEW TEAM
REPORT**

POTENTIAL SCHOOL SITES

COLUMBIA, CONNECTICUT

REVIEW DATE: FEBRUARY 21, 1989

REPORT DATE: APRIL 1989



20 Years of Service 1969 -1989

Eastern Connecticut Resource Conservation and Development Area, Inc.

Eastern Connecticut Environmental Review Team

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ENVIRONMENTAL REVIEW TEAM REPORT ON POTENTIAL SCHOOL SITES COLUMBIA, CONNECTICUT

This report is an outgrowth of a request from Columbia First Selectman to the Tolland County Soil and Water Conservation District (SWCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on Tuesday, February 21, 1989. Team members participating on this review included:

Nick Bellantoni	State Archaeologist	CT Museum of Natural History
Barbara Buddington	Senior Planner	Windham Regional Planning Agency
Nancy Murray	Biologist	DEP - Natural Diversity Data Base
Joe Neafsey	District Conservationist	USDA - Soil Conservation Service
Harry Siebert	Transportation Planner	ConnDOT - Bureau of Planning
Elaine Sych	ERT Coordinator	Eastern CT RC&D Area
Bill Warzecha	Geologist	DEP - Natural Resources Center

Prior to the review day, each Team member received a summary of the proposed project, a list of the town's concerns, a location map, a topographic map, and a soils map. During the field review the Team members were given additional information. The Team met with, and were accompanied by the Town Planner and members of the Inland Wetland Commission, the School Building Committee and the First Selectman. Following the review, reports from each Team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project -- all final decisions rest with the Town and landowner. 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. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in making your decisions on this a new school site.

If you require additional information, please contact:

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INTRODUCTION

The Eastern Connecticut Environmental Review Team at the request of the Columbia First Selectman have been asked to review three (3) sites being considered for a new school facility. Recent town growth and future pupil projections indicate a need for expanded school facilities. The School Building Committee will use the ERT report to assist them in their evaluation of the three sites. This report contains two parts, the first dealing with natural resource information such as the geology, geologic limitations, soil resources and biologic resources of the sites, and the second part discusses an archaeological review and planning considerations of all the sites. Part Three contains the maps.

PART ONE

NATURAL RESOURCE INFORMATION

SITE #1 - TOWN OWNED LAND

1. Topography and Setting

The Hennequin Road site, which totals about 135 acres, consists of an irregularly shaped parcel of land located near Columbia center. It is owned by the town and the eastern parts are used as the town recreation area. The western and eastern parts encompass Utley Hill and a large stream-lined hill, respectively. A large wetland separates the upland areas of the site and is owned mostly by Joshua's Trust. Except for the existing recreational fields in the eastern parts, the site consists of wooded land. Slopes range from flat to very steep. The steepest slopes flank the east side of Utley Hill and are controlled by the underlying bedrock. The flattest slopes occur on top of the streamlined hill in the eastern parts where the recreational fields are located. The site is now zoned for residential use, but could accommodate a school facility by special permit.

2. Geology

The entire Hennequin Road site is covered by till. Till is a glacial sediment that was deposited from a mass of ice. Clay, silt, sand, gravel, and rounded or angular boulders are mixed together in varying proportions in the till. Sand is generally the dominant component, although compact silty layers or clusters of stone are the features that may capture one's attention. The upper few feet of the till are normally loose or only moderately compact, but below these depths the till may become siltier and tightly compact. As reported by the Soil Survey for Tolland County, the till in the eastern parts is characterized by a dense, compact till. In general, the till covering Utley Hill in the western parts is relatively thin. Several areas of scattered rock ridges in the western parts suggest that the till is less than 10 feet thick in most places. The till in the eastern parts may be much deeper.

As mentioned earlier, the northern tip of a large, swampy area separates the upland areas of the parcel. The swamp deposits, which are post-glacial, consist of a peaty, mucky material mixed or interbedded with silt and sand. Standing water is present much of the year. This area is inappropriate for any type of development. It does, however, have important hydrological, ecological, and educational attributes.

Bedrock on the site is exposed only on Utley Hill where it makes long hillside ledges. The bedrock underlying the site is identified as Canterbury Gneiss, a medium-grained, gray-to-white granodiorite gneiss composed mainly of the minerals oligoclase, orthoclase, quartz and biotite.

The shallow to bedrock soils and steep slopes will limit development potential in the western parts of the site. Additionally, a major wetland crossing (deep, peaty and mucky soils) would be required to gain access to the western parts of the site. The presence of compact till will be the major geologic limitation in the eastern parts. The presence of a hardpan layer close to the surface usually results in a seasonally high water table. Additionally, the compact soil zone is usually slowly permeable. A seasonally high water table can cause failure of a leaching system if it is not properly addressed from an engineering standpoint. These limitations (shallow to bedrock soils, compact till, steep slope), will weigh most heavily in the ability to provide adequate subsurface sewage disposal, since municipal sewers are not available in Columbia. Of the two areas (eastern vs. western) it appears that the western parts (shallow to bedrock soils, steep slopes, and major wetland crossing) would be the least favorable for a school site. Properly engineered systems may be able to overcome the geologic limitations in the eastern parts, but detailed soil testing would have to be done to determine specific areas of suitable soils. As a result, the flat to gently sloping areas in the eastern parts appear to be moderately favorable for a school facility. There is additional flat to gently sloping land west of the recreational fields that belongs to Joshua's Trust. Perhaps the land in the western parts of the site (Utley Hill area) and the swampy area in the central parts could be swapped for the flat to gently sloping land in the eastern parts of the Joshua Trust. This would result in a more contiguous flat land area more suitable for a school site.

3. Hydrology

Except for the eastern limits, the Hennequin Road site drains to the large wetland that separates the upland portions of the site. The outlet stream for the wetland drains northward to Columbia Lake. The eastern limits of the site drains either eastward to Dam Brook or Giffords Brook.

Development of the site for a school (large building, parking lot, paved court surfaces) will entail runoff increases. A detailed stormwater management plan would be required, if plans become more definite. It seems likely that the wetland on the site would have natural detention capabilities. The presence of silty soils and moderate slopes underscores the need for erosion and sediment control. Every effort should be made to protect Columbia Lake, Dam Brook and Gifford Brook from potential siltation.

If the eastern parts of the site are developed, deep cuts in hardpan may be required. Deep cuts in hardpan are extremely difficult to stabilize due to seepage of water over the hardpan layer. This water creates an unstable condition just below the seepage line. The weight of the unstable soil causes the soil to flow down the slope. Once this begins, the slope is very difficult to stabilize. The establishment of a good vegetative cover is practically impossible on these eroding slopes. Besides the unsightly condition, the eroded soil must be removed from the base of the slope. The presence of compact till indicates the potential for seasonally high water tables. Depending upon topographic conditions, drainage work, which includes curtain drains and building footing drains, will probably be required on the site. The purpose of the drain will be to intercept groundwater so that it does not interfere with playing fields and create wet basements. The drains may also be used to protect the septic system. The curtain and building footing drains should be installed in compliance with the State Public Health Code, Technical Standards, and any town or state regulations. They should be outletted so that they do not cause flooding or water quality problems on or off site.

4. Sewage Disposal

Since the proposed school facility will discharge sewage in excess of 5,000 gallons per day, the Department of Environmental Protection's (DEP) Water Compliance Unit must issue a permit. According to a report (Lenard Engineering, Inc.) made available to Team members, the wastewater flow projections for the school would be about 8,570 gallons a day.

Before the DEP could act on a permit application, the project engineer would have to provide detailed technical information on the hydrogeologic conditions in the disposal area, the design of the sewage disposal system, a thorough hydraulic analysis of the disposal areas, and analysis of the probable impact on any nearby water resources and the underlying aquifer from a drinking water quality standpoint. This last requirement should include an analysis of bacterial travel, virus removal and nitrate and phosphate transport. The burden of proof is clearly upon the Town to show that the proposed sewage disposal system(s) will function properly and not pose a threat to the environment or public health. The town sanitarian, in conjunction with the DEP and Department of Health Services staff, will also play an important role in the permit application, review of the plans, and inspection of the sewage disposal system(s) during installation.

Development of the site should proceed only within the limits of acceptable density as pertains to the capacity of the soil and, particularly, without overloading the site with too great a volume of sewage wastewater discharge.

Groundwater in the area is classified by the DEP as GA, which means that it is suitable for private drinking water supplies without treatment.

5. Water Supply

Since no public water facilities are in the area, bedrock would be the only practical source of water for the Hennequin Road site. Bedrock is commonly capable of providing small but reliable yields of groundwater to individual wells. A survey of bedrock wells in northwestern Connecticut

(see Connecticut Water Resources Bulletin No. 21) indicates that more than 80 percent of those wells that were drilled into a rock type (granite gneiss) similar to that found on the site yielded three gallons per minute or more, and 90 percent yielded two gallons per minute or more. These yields are equivalent to 4,320 and 2,880 gallons per day, respectively.

A well yielding about 6 gallons per minute would be equivalent to 8,570 gallons/day, the projected water use for a new school. According to the Water Resources Bulletin #21, approximately 65% of the wells surveyed which tapped granitic bedrock have yields of 6 gallons per minute or more. It seems likely that a school with projected flows of 8,570 gallons per day would require a minimum of two wells. There is a chance that a third well would be needed.

Any well or wells serving a school will first require approval by the State Department of Health Services (Public Water Supply Section), the Department of Public Utilities Control, and the local health department.

Information on projected needs of the development in terms of water quantity, water quality testing and plans for pumpage, storage, treatment, if necessary, and the distribution system would also be necessary for a school water supply.

The natural quality of the groundwater would be expected to be generally good in the area.

SITE #2 - THE BECKISH PROPERTY

1. Topography and Setting

The Beckish property is about 75 acres in size and is located just west of the center of Columbia. It has frontage on Route 66 to the south and Route 87 to the northeast. The land, which faces northeast slopes to Dam Brook (a Giffords Brook tributary) and its accompanying wetlands. It is privately owned. Slopes range from flat (0-3%) at the western parts to moderately steep (8-15%) in the eastern parts.

2. Geology

The Beckish property is covered entirely by till. Till is a glacial sediment that was deposited directly from glacier ice. The sediment consists of varying proportions of sand, silt, gravel, clay, and boulders. Particles of different sizes are generally mixed together in a complex fashion. Except for the till east of Dam Brook, the texture of the till on the site is silty, stony, and compact. The till east of Dam Brook is sandy and loose or moderately loose. The exact thickness of the till is unknown, but it probably exceeds 10 feet in most places. It is shallowest south of the Columbia Cemetery, where ledgerrock is well exposed. The land area that immediately parallels Dam Brook is swampy. Sediments here consist of silt, sand, clay, and a high percentage of decayed organic material. The wetland and Dam Brook divorce the western parts of the site from the eastern parts. Connection of the two would require a substantial wetland crossing.

Bedrock underlying most of the site consists of a silvery-weathering, medium-grained gneiss composed principally of the minerals biotite and muscovite. In the upper parts of the formation (Tatnic Hill Formation, Yantic Member) the rock may locally grade into a rusty-weathering muscovite-graphite schist. Bedrock underlying the western limits of the site is Canterbury Gneiss (see geology section for Site #1). The Tatnic Hill Formation probably lies below the Canterbury Gneiss in the western parts.

From a geologic standpoint, the most favorable area for a school facility on the Beckish site is in the western parts. Slopes are flat to gentle for the most part, but become steeper near Dam Brook. Seasonally high groundwater tables would affect sewage disposal installation on the site. Additionally, drainage would be required for the construction of ball fields.

3. Hydrology

The entire site drains to Dam Brook, which bisects the parcel. This south flowing stream ultimately flows into Giffords Brook. At its confluence with Giffords Brook, Dam Brook drains an area of 1.05 square miles or 672 acres.

The construction of a school facility and change of land use (wooded to open playing fields) would increase the amount of runoff during periods of rainfall. These increases would result from soil compaction, removal of vegetation, and placement of impervious surfaces (rooftops, parking lots, tennis and basketball courts, etc.) over the soil. The runoff increases for this type of development would be expected to be high. The wetlands that parallel Dam Brook and the small pond (Dam Brook impoundment) east of the site would have some natural detention capabilities. The condition and stability of the impoundment on the pond should be investigated if the site is developed. Also, all downstream culverts should be checked. Efforts should be made to protect Dam Brook and the pond from sand and other parking lot debris.

4. Sewage Disposal

As mentioned earlier, the +/- 75 acre Beckish Property is somewhat limited for a school facility due to the relatively shallow permeable soil layers found above a compact glacial till known as "hardpan." Common problems with hardpan soil include slow percolation rates and seasonally high water tables. On-site soil testing should be conducted to determine if a sufficient leaching area can be identified and preserved on the site. Sewage disposal systems typically constructed in soil (hardpan) found on most of the site requires the installation of groundwater control drains and placement of sandy fill material to elevate leaching systems above seasonally high groundwater tables. Since septic flows will exceed 5,000 gallons per day (DEP-Water Compliance permit), one can expect that the sewage disposal system will require use of large land areas and extensive soil testing in order to determine feasibility.

5. Water-Supply

Bedrock appears to be the only practical source of water to the Beckish Property. The Tatnic Hill Formation that underlies most of the property would probably not have any better aquifer potential than the Canterbury Gneiss. Both would probably provide comparable yields to individual wells. As is the case with the Hennequin Road site, the Beckish will probably require more than one well to serve a school facility.

The natural quality of the groundwater should be good. However, the Tatnic Hill Formation may be tainted with elevated levels of iron, iron sulfides and/or manganese, especially its upper parts. As a result, water treatment filters may be required to reduce iron and/or manganese levels.

The location, installation and construction of school water supply wells will need to be coordinated with the town sanitarian, Department of Health Services' Public Water Supply section and Department of Public Utility Control.

SITE #3 - THE MITTLEMAN PROPERTY

1. Topography and Setting

The Mittleman Property is a +/- 50 acre privately-owned parcel of land located east of Columbia Center. It abuts Route 66 on the north, Old Willimantic Road on the east, Szegda Road on the south and privately owned land on the west. The parcel consists of an open field in the front (Route 66 side) parts and wooded land for the remainder. Except for the open field, which is flat, the site slopes steeply to the southeast. The steep concentration of slopes in the southern parts is controlled by the underlying bedrock. Ledgerrock is exposed throughout this area.

The site is presently zoned for residential use. The land to the south, east, and west is largely undeveloped. To the north of the site is Route 66, Porter School, firehouse, post office and various residential and commercial buildings.

2. Geology

The geologic characteristics of the Mittleman Property range from moderately suitable to poorly suitable for a school facility.

Soil mapping data indicates that the parcel is covered by till. Till is a sediment that was deposited directly from an ice mass. It consists of a nonsorted, generally structureless mixture of sand, silt, clay, gravel, and

angular to rounded boulders. The till that covers the +/- 6 acre open field on the northern parts is characterized by a texture which is sandy and loose. The till covering the remainder of the parcel is relatively thin.

Bedrock underlying the site consists of two subunits of Tatnic Hill Formation, the Yantic Member and Fly Pond Member: The Yantic Member underlies the central and northern parts of the site and has been described in the previous geology section (see Site #2). The remaining part of the site is underlain by a speckled gray-green, medium grained calc-silicate rock composed of the mineral scapolite, hornblende and diopside, known as the Fly Pond Member. The latter minerals are rich in calcium and silicon. Bedrock ledges are well exposed on the steep slopes in the southern part.

From a geologic standpoint, the +/- 6 acre open field in the northern parts is the most favorable area for a school but may be limited by its size. Outside of the open field, the parcel becomes rocky or shallow to bedrock. It is also generally steeply sloped. A sound development outside of the open field would undoubtedly require a tremendous capital outlay for land preparation.

3. Hydrology

Surface runoff from most of the site (central and southern parts) flows under Szedga Road to a Gifford Brook tributary. Most of the open field in the northern parts drains towards Route 66. Water is intercepted by road drainage and routed under Route 66. It then flows into the Clarks Brook watershed.

The development of the Mittleman Property for a school would generate increases in runoff conditions. Careful examination of culverts passing under Route 66 is warranted to ensure they can handle post-development flows without causing flooding problems in the area. It seems likely that the wetland area south of Szedga Road may be useful for controlling post-development increases in runoff and may have natural cleansing abilities. However, storm drainage outletted onto the steep slopes in the central and southern parts could result in major erosion problems.

A stormwater drainage plan accompanied by an erosion and sediment control plan will need to be carefully considered on this site.

4. Sewage Disposal

The CaA and CaB soils (relatively, deep, sandy till) that cover the open field in the northern parts may be the most desirable soils for subsurface sewage disposal on the three sites reviewed. Detailed soil testing would be required to determine subsurface conditions and the land's suitability for subsurface sewage disposal. Because wastewater generated by a school facility would exceed 5,000 gallons/day, the septic system would need to be designed by a professional engineer and reviewed by the State Department of Health Services and Environmental Protection as well as the local health department.

5. Water Supply

Public water facilities are not presently available to the Mittleman site. Bedrock would undoubtedly be the principal, if not sole, source of water. Bedrock is commonly capable of supplying small but reliable yields of groundwater to individual wells. Groundwater moves through bedrock by way of an interconnected fracture system. Most wells that penetrate 150 to 200 feet of bedrock will intersect enough fractures to supply at least 2 or 3 gallons per minute. Some wells, however, fail to intersect any water-bearing fractures. There is no practical way of predicting whether any particular location will be good for drilling a well.

If the total daily demand for water is 8,570 gallons per day, two or more wells may be required if the yields are about 3 or 4 gallons per minute. Storage capacity will usually be needed to allow the flow rate from the system to exceed the actual rate of return flow from the ground into the well. The well shaft will provide some of this storage, but tanks may be needed for some uses.

The bedrock underlying the site may contain a relatively high percentage of iron-bearing minerals. Some undesirably high concentrations of iron or manganese may occur in well water drawn from

the site, but there are several types of filters available to combat this problem.

SOILS REVIEW

The following comments are provided as the result of a field examination of these sites by the team on February 21, 1989 and subsequent visits.

1. General Soils Information

The information contained in the Soil Survey of Tolland County, Connecticut appears to be adequate for general planning purposes. A copy of the field sheets (soils map) are included with the approximate boundaries outlined. Basic interpretive information for the four map units are attached for inclusion into the report. These four mapping units have the best potential for school site development. The two basic criteria for soils are gently sloping soils (0% to 3%) that are moderately well drained to well drained. As the School Building Committee narrows the site selection to one parcel it is suggested that they retain the services of a qualified private soil scientist to review the information contained in the Soil Survey of Tolland County, Connecticut, examine conditions in the field and provide the committee with an "order 1" (highly detailed) soil survey of the area including a map and more detailed interpretive information for the sites. This can be done in conjunction with evaluating deep test pits on the site.

Map units within the boundaries of the three sites reviewed that have the best potential for school site development are: CaA, WxA, WyA, and WzA. Note that there may be additional suitable areas within other map units. These areas, if any, will be mapped out in the "order 1" survey.

Note that map units WxA and CaA are prime agricultural soils. Conversion of these lands to other than agricultural uses may require concurrence of the Connecticut Commissioner of Agriculture if State funding is being used.

2. Wetland Boundary Information

The general location of wetland soils on the three sites reviewed can be seen on the Soil Survey field sheets. Once the committee selects a site, the committee should have a qualified private soil scientist delineate wetland boundaries in the field. The boundaries should be flagged and numbered sequentially. This information should then be surveyed onto the plan map. The soil scientist should then review and sign a statement on the map(s) certifying that the information is substantially correct.

If this procedure is followed and discrepancies are found, the Tolland County Soil and Water Conservation District can on request review the submitted information for adequacy.

3. Soil Erosion and Sediment Control Plan

A detailed soil erosion and sediment control plan should be developed and implemented for the selected site. The plan should be developed using the criteria contained in the Connecticut Guidelines for Soil Erosion and Sediment Control (1985). The Tolland County Soil and Water Conservation District would appreciate the opportunity to review this plan prior to final approval.

4. Soils Descriptions

CaA - Canton and Charlton soils, 3 to 8 percent slopes

This mapping unit is considered prime farmland according to USDA-SCS criteria.

This unit consists of gently sloping, deep well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly rectangular or irregular in shape. Slopes are generally smooth and convex and 200 to 400 feet long. About 45 percent of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few large, nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderately rapid. Both soils have medium to rapid runoff, have moderate available water capacity.

Instability of some excavations in the Canton soils is the main limitation of these soils for community development.

WxA - Woodbridge fine sandy loam, 0 to 3 percent slopes

This mapping unit is considered prime farmland according to USDA-SCS criteria.

This soil is nearly level and moderately well drained. It is on the top and lower side slopes of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm and very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Leicester and Ridgebury soils. A few small areas have stones on the surface, and a few large areas have a surface layer and subsoil of silt loam. Included areas make up about 10 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium.

This soil is well suited to woodland and cultivated crops and is considered prime agricultural soil. The main limitation for crops is the seasonal high water table, which causes the soil to dry slowly in the spring. Providing drainage helps to dry this soil earlier in the spring, but even drained areas remain wet for several days after heavy rains.

The water table and slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for on-site septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

WyA - Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony

This soil is nearly level to gently sloping and moderately well drained. It is on the tops and side slopes of drumlins and hills on glacial till uplands. The areas are mostly long and narrow or irregular in shape. Stones cover 1 to 8 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown, and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam, and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Leicester and Ridgebury soils. A few small areas do not have stones on the surface. Included areas make up about 10 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. The available water capacity is moderate. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium.

Most areas of this soil are in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation, but is well suited to woodland. Stone removal makes the soil well suited to cultivated crops, but is difficult. Seasonal wetness is an additional limitation of the soil for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for on-site septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

WzA - Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony

This soil is gently sloping to sloping and moderately well drained. It is on the tops of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape. Stones cover 8 to 25 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for on-site septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

NATURAL DIVERSITY DATA BASE

The Natural Diversity Data Base maps and files have been reviewed regarding the three proposed school sites. According to our information, there are no known extant populations of Federally Endangered and Threatened species or Connecticut "Species of Special Concern" occurring at Site #2 and Site #3 in question.

A portion of Site #1-Town Owned Land is a Natural Area Inventory Site - Utey Hill Swamp. The 1981 update on file states that the area is a large shrub swamp draining to Columbia Lake.

The swamp canopy consists of Red Maple, Black Ash and Poison Sumac with some Black Gum and Yellow Birch.

Natural Diversity Data Base information includes all information regarding critical biologic resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultation with the Data Base should not be substituted for on-site surveys required for environmental assessments. Current research projects and new

contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

PART TWO

PLANNING CONSIDERATIONS

ARCHAEOLOGICAL REVIEW

The State Historic Preservation Office notes that two of the proposed development sites (sites #2 and #3) are located in immediate proximity to the Columbia Historic District listed on the State Register of Historic Places. It is recommended that if construction occurs in either of these sites that the visual integrity of the historic district be maintained. In this regard, we encourage the retention of all mature tree species as a natural buffer whenever feasible. Likewise, we recommend that the maximum building height take into consideration the viewscape from various locations within the Columbia State Register Historic District.

A review of the State of Connecticut's Archaeological Site Files and Maps indicate two prehistoric occupations located on the Mittleman property. Historic references mention Native American use of the Columbia area. These historic references suggest that a village site may be located somewhere within the three sites proposed.

On-site field inspection of Site #1 - Town Owned Land yielded an above-ground structure. This earthen dam is in extremely poor condition and not historically significant. On-site inspection of the Site #2 - Beckish property yielded a small stone dam, a man-made pond and the remains of an old road which crossed over the stream which drains into the pond. These physical remains are not seen as being historically significant. On-site inspection of Site #3 - Mittleman Property yielded no above-ground structures. However, two prehistoric sites have been recorded.

Our field reviews are extremely limited and subsurface testing may very well reveal evidence of prehistoric and historic occupations. Based on predictive models of archaeological site surveys conducted in eastern Connecticut, the impact areas are regarded as having a high potential for prehistoric Native American habitations, especially on the rises adjacent to the stream on Site #1.

A professional archaeological reconnaissance survey is recommended in order to locate and identify all prehistoric and historic cultural resources on Sites #1 and #3 should they be selected for school building construction. All archaeological studies should be undertaken in accordance with the Connecticut Historical Commission's Environmental Review Primer for Connecticut's Archaeological Resources.

In summary, the proposed project areas are located in areas of importance to prehistoric and historic lifeways as well as in immediate proximity to the Columbia State Register Historic District. The landscape of the historic district should be considered in the planning process. An archaeological survey for Sites #1 and #3 is recommended. All feasible efforts should be undertaken to identify and ensure the preservation and conservation of the cultural resources in these areas.

PLANNING REVIEW

1. Consistency with Local, State and Regional Plans

a. Relationship to local zoning

All three sites - #1, the town-owned recreation area, #2, the Beckish property, and #3, the Mittleman property, are zoned for residential use. Local zoning allows the construction of a school in a residential zone by special permit.

b. Relationship to Town Plan of Development

A survey of town residents and landowners done in conjunction with the plan of development indicated a majority of respondents wished to have town facilities and services centralized until such time as the town is populated sufficiently to warrant neighborhood based services (i.e., fire and schools).

The portion of the plan dealing with public facilities and services recommend:

Policies:

- Maintain present centralized public facilities and services.
- Encourage provision of neighborhood recreation and fire protection where warranted and when warranted.

Implementation Strategies:

- Evaluate the need for decentralized public services as town growth warrants.
- Acquire recreation areas in neighborhoods through open space subdivision dedication requirements and other acquisition programs.
- Zoning regulations should be revised to recognize and allow for the expansion of public facilities in the town center in compliance with the character of the existing structures in and around the historic village center-town green. Aesthetic and architectural standards for new or expanded public facilities (schools, town hall, fire station, etc.) should be considered.

The plan also recommends protection of aquifers through regulation of land uses to minimize contamination of groundwater. One potential high yield aquifer which might be the source of future drinking water

supplies is in the town center west of Route 87 running more or less parallel to it, between Route 66 and Lake Road. Site #2 (Beckish property) includes a portion of this aquifer. Any use of this land for a school site should be evaluated for its impact on this potential public drinking water supply.

c. Relationship to the Regional Growth and Preservation Guide Plan

Site #1, the town-owned recreation area, is categorized by the Guide Plan as a Land Preservation District because of its status as an existing recreation area. The western half of the site falls within the Lake Watershed Preservation District associated with Columbia Lake. The present intensive recreational facilities (tennis courts, playing fields, pavilion, etc.) lie at the eastern end of the parcel. Any development (such as a school) to the west would have to carefully consider the potential effects on the watershed area; siting a school at the eastern end such that the building, driveways, and parking spaces would displace existing recreational facilities may require the town to develop additional recreation areas elsewhere in the town to meet the needs of the residents.

The Guide Plan's recommended policies for Lake Watershed Preservation and Historic - Land Preservation Districts are shown below. The siting of a school on this property may conflict with the recommendations to protect natural and recreation areas and would require special attention to preserve the "water quality and hence usefulness" of Columbia Lake.

Regional Plan Guidelines

6. Historic - Land Preserve District

The region is rich in historic sites, forest product producing areas, and areas of great interest as natural science laboratories and recreational areas. The entire region benefits from the protection of these areas since they are what gives the region its uniqueness--its attractiveness.

(Policy for the Historic-Land Preserve District)

-A buffer of very low density development with, in the case of historic sites and village centers, compatible architectural design should be provided.

-Special emphasis should be placed on the restoration of village centers and development which is not compatible architecturally with town centers should be excluded.

-Historic areas and town centers should be bypassed by major traffic arteries wherever possible. Town greens should be carefully landscaped and where they have been eliminated by, for example, highway construction, they should be restored.

- Tax incentives should be developed which will encourage the rehabilitation and restoration of historic buildings.

-Historic buildings which qualify for inclusion on the Windham Region Register of Historic Sites (which includes those on the National Register of Historic Sites) should be given a grace period after they are restored during which time they will not be reassessed for tax purposes.

7. Lake Watershed Preservation District

Lakes in the region serve a variety of purposes including recreational opportunities and enhancement of the landscape. Lakes are fragile entities whose water quality and hence usefulness could be threatened by land uses within lake watersheds.

(Policy of the Lake watershed Preservation District)

-Towns should adopt and enforce sediment control ordinances within lake watersheds.

-New development around lakes should be set back at least 300 feet from the high water line.

-Minimum lot sizes within lake watersheds should be based on physiographic considerations. Generally minimum lot sizes should be two acres or more in order to reduce the amount of deleterious material transported by erosion to lakes.

-Discharges of phosphorus from on-site waste disposal systems should be eliminated either through reconstructing the on-site system, reducing or eliminating the discharge of phosphorus producing materials into the system or collecting effluent as it leaves the septic tank for transport and treatment-disposal away from the lake shore.

-Municipalities--and where appropriate, private associations--should maintain storm drainage structures and construct new drainage structures where such structures will significantly reduce the amount of sediment and other materials entering lakes.

Sites #2 and #3 fall almost entirely into areas categorized as Low Density Rural Districts. Guidelines for such areas include a low density of development, preservation of agricultural lands and operations, creation of new recreational facilities or nature preserves, and minimization of the development of existing road frontages.

Site #2 (Beckish) is adjacent to a district designated by the Guide Plan as an Historic - land Use Preservation District on the west side of Route 87 from Route 66 north to Lake Road. Although the parcel has a small access strip from Route 87, the only reasonable access for school buses would be from the frontage of Route 66. The placement of a school on this site would not conflict with the regional Guide Plan.

Site #3 (Mittleman) is the closest of the three sites to Columbia's center of town and retail services. On the Guide Plan map, it abuts - or may

be partially included in an area designated as a Local Retail Service District. It is very near the existing school, and has easy access from Route 66. From the perspective of the Guide Plan, which recommends the centralization of town services, this would be the most appropriate location for a school of the three being considered.

d. Relationship to the State Plan

The State Policies Plan for the Conservation and Development of Connecticut designates Site #1 as Existing Preserved Open Space. For such an area, the State would support permanent continuation as open space and would discourage structural development "except as may be consistent with the open space functions served." The State Plan would therefore discourage the use of this site for a school.

State personnel have advised the if any federal Land and Water conservation funds were used by the town in purchasing this tract as open space, there may be legal difficulties in locating a school on this land.

Both Sites #2 and #3 are designated as "Rural Community Center" areas, for which the State's strategy is to "cluster in locally designated areas the relatively higher intensity land uses of residential, shopping, employment, and public facilities and services occurring in rural communities." The siting of a school in such as designated area would be consistent with the State Plan.

2. Compatibility with Surrounding Land Uses

Site #1, is bordered by a tract owned by Joshua's Trust (filing in the "U" shape of the town-owned land, and by the residential areas along Lake Road, Hennequin Road, and Route 66. The several parcels of land bordering to the west and south are large (approximately 50-80 acres) and currently undeveloped.

Site #2, the Beckish property, is bordered by residential areas along Routes 87 and 66. The land to the northwest and south is undeveloped. The parcel just to the south has gently sloped fields adjacent to some of the flatter land in the Beckish property. From information gathered on the site

visit, it appears that these fields are currently being worked to produce feed for livestock.

Site #3, the Mittleman property, borders residential areas along Route 66, Old Willimantic Road, and Szegda Road, and abuts Fireman's Field on the west.

The development of a school on any of these sites would not be inconsistent with the surrounding land use.

3. Other Considerations

a. Access

Site #1 is accessed from Hennequin Road, which would need widening to comfortably handle passing school buses. The increase in traffic on Hennequin Road which might be generated by a school at this site is unknown, since the town has not determined which grades would attend a new school. An overhead blinking traffic light is currently used at the intersection of Route 66 and Hennequin Road. The Department of Transportation recorded 9 accidents at this intersection over a three year period (1984-87), most involving left hand turns by eastbound traffic onto Pine Street or by westbound traffic onto Hennequin Road. Safety improvements to this intersection would be needed if a school were located on Site #1.

Site #2 would be accessed directly from Route 66 just to the west of the intersection of Routes 66 and 87. A turning lane may be needed for eastbound traffic. The land slopes generally upward from the northeast to the southwest, with the most level area in the southwest section. The eastern side of the parcel has a dam. A long access road would be required to reach an area suitable for the construction of a school and for possible playing fields.

Site #3 also has direct access from Route 66, just to the east of the intersection of Routes 66 and 87. No long access road would be necessary, as the most logical placement of a school would be along the northern edge

of the property, near Route 66, with a recreation area behind it. A major concern is the poor sight line for west bound traffic along Route 66 approaching this site.

4. Conclusion

From a planning perspective, it would appear better for the town to leave its existing recreation areas (Site #1) intact and to site a school elsewhere. The general characteristics of the Beckish property - the contours of the land, the inland wetlands and dam, the need for a long access road, and the lack of level land which might be naturally suited for playing fields - make this site a more likely candidate for additional extensive recreation (hiking trails for example) than for a school. The Mittleman property, although steeply sloped toward the south, seems to have sufficient space for a school building and accompanying playing fields, no significant problem with inland wetlands that could be identified, and ready access from Route 66. From a planning standpoint, this site appears to be the most suitable of the three, although there is concern about the poor sight line for traffic approaching from the east.

TRANSPORTATION CONCERNS

The Three sites reviewed were:

- Site #1-Town Owned Land
- Site #2- Beckish Property
- Site #3- Mittleman Property

Site #1 - This site does not front on a State road but traffic generated would produce an increase to the traffic volume of 7,200 Average Daily Traffic (ADT) south of the Route 66, Hennequin Road intersection. The increase in traffic would not be greater than the anticipated annual increase in traffic. The site would require a long access road from Hennequin Road. The dual use of the town property for recreation and a new school would require a minimum 24 foot wide road with a preferred

width of 30 feet. The Hennequin Road/Route 66 intersection would require a by-pass lane to provide safe traffic operations. Secondary benefits of this site are: The access road could be utilized for the loading and discharge of passengers on school buses, overflow parking for recreation activities and access to Route 87.

Site #2 - This site is extremely limited by slope, water features and wetlands for a school site. Site access will be from Route 66 with the possibility of access to Route 87 by an existing right-of-way. This right-of-way may not have sufficient width to construct a drive for two-way traffic operations. The appropriate access from Route 66 will require cut and fill for the access road, shoulder improvements on Route 66, and a by-pass lane and traffic control to provide adequate sight-line.

Site #3 - This site also has traffic operational constraints. The average daily traffic is 10,200. The only feasible access is a driveway from Route 66. Access to Szega Road is limited by a severe slope. Access to Old Willimantic Road is again limited by the natural slope and the grade of a driveway would be steep, even with a minor cut. Sight-lines on Route 66 will require improvements to Route 66 combined with traffic control devices.

The most suitable site to develop is Site #1 from a traffic perspective, even though the access road from Hennequin Road would have a substantial length.

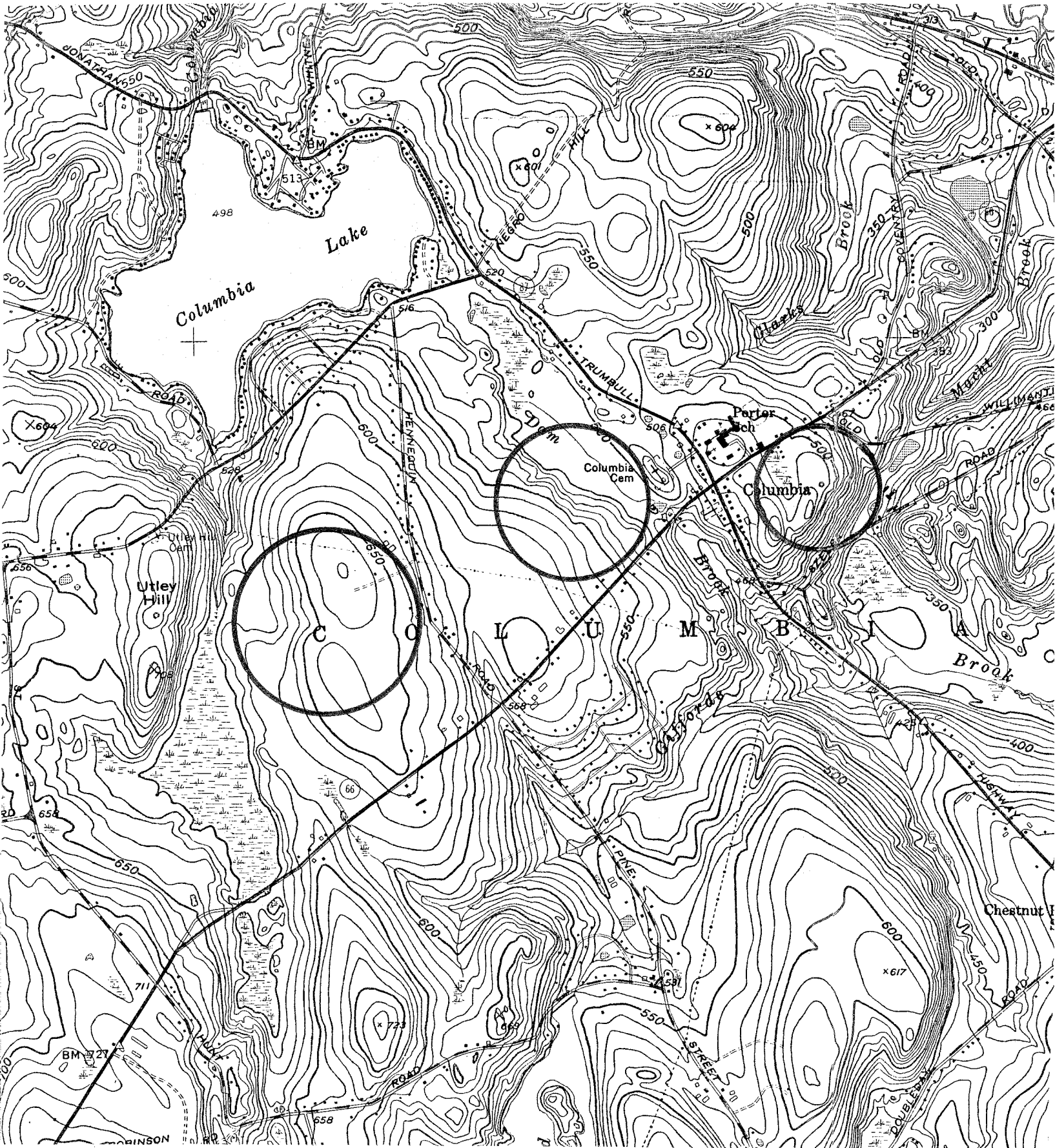
PART THREE

MAPS

LOCATION

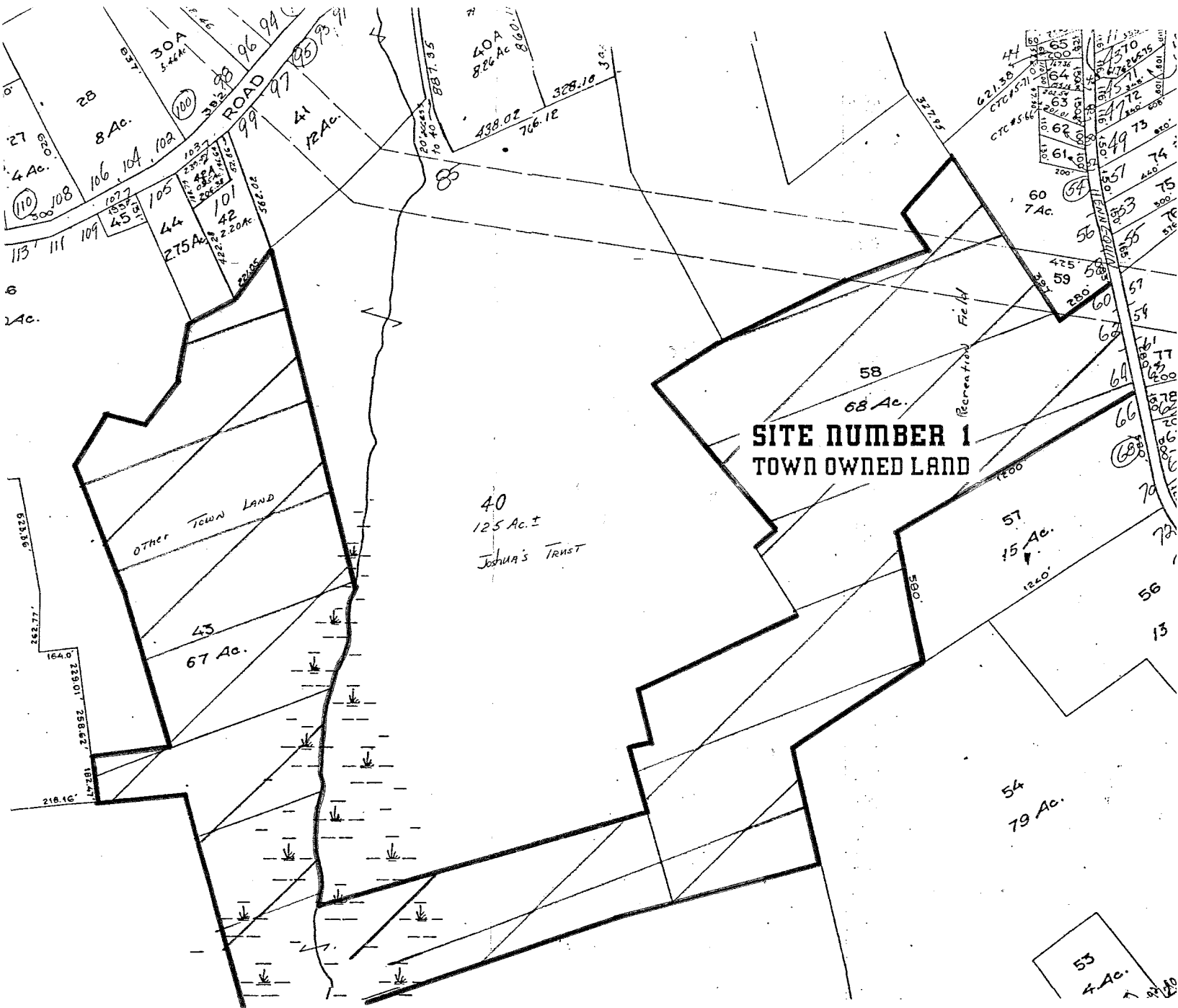
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 APPROXIMATE LOCATIONS



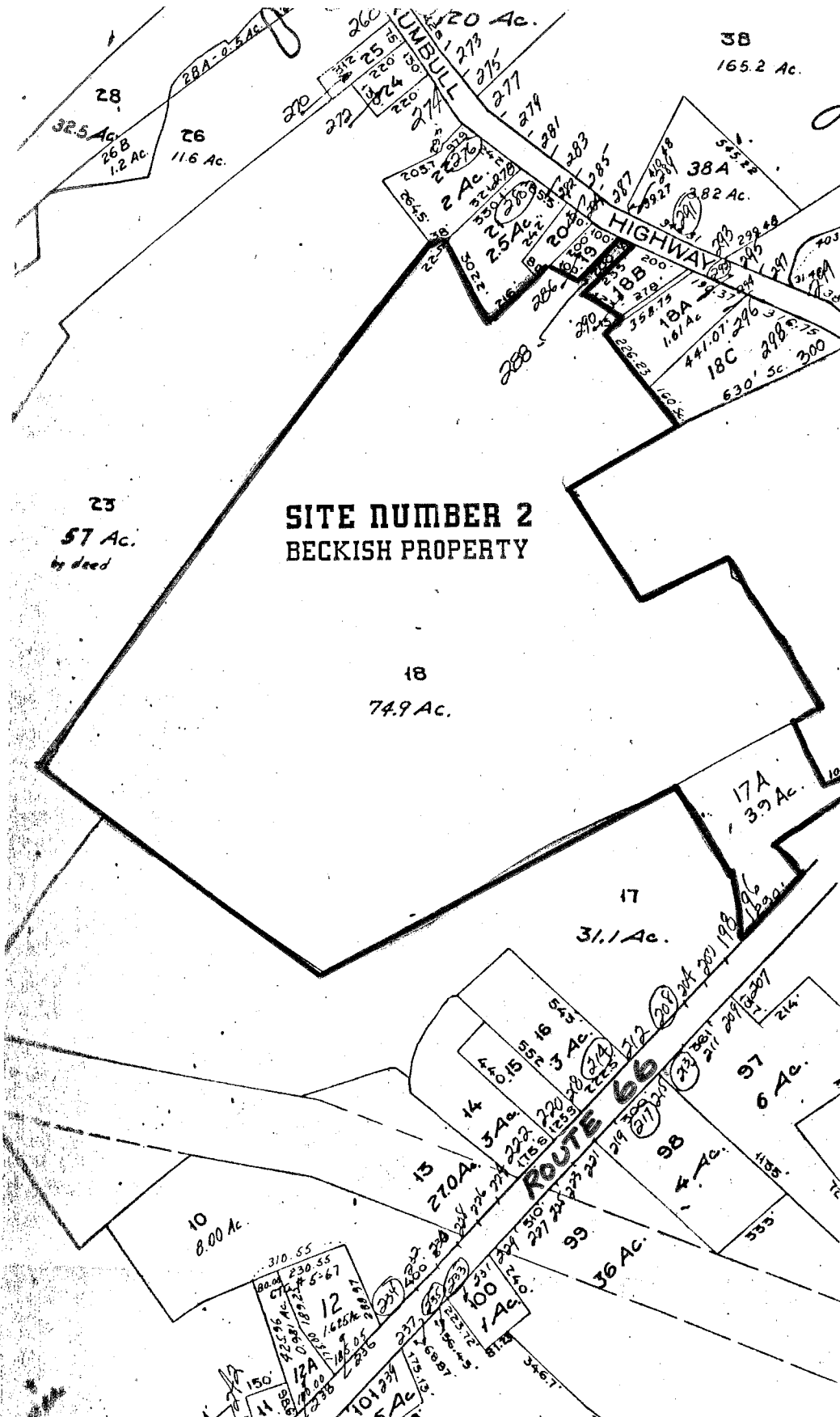
PROPERTY BOUNDARY - SITE #1

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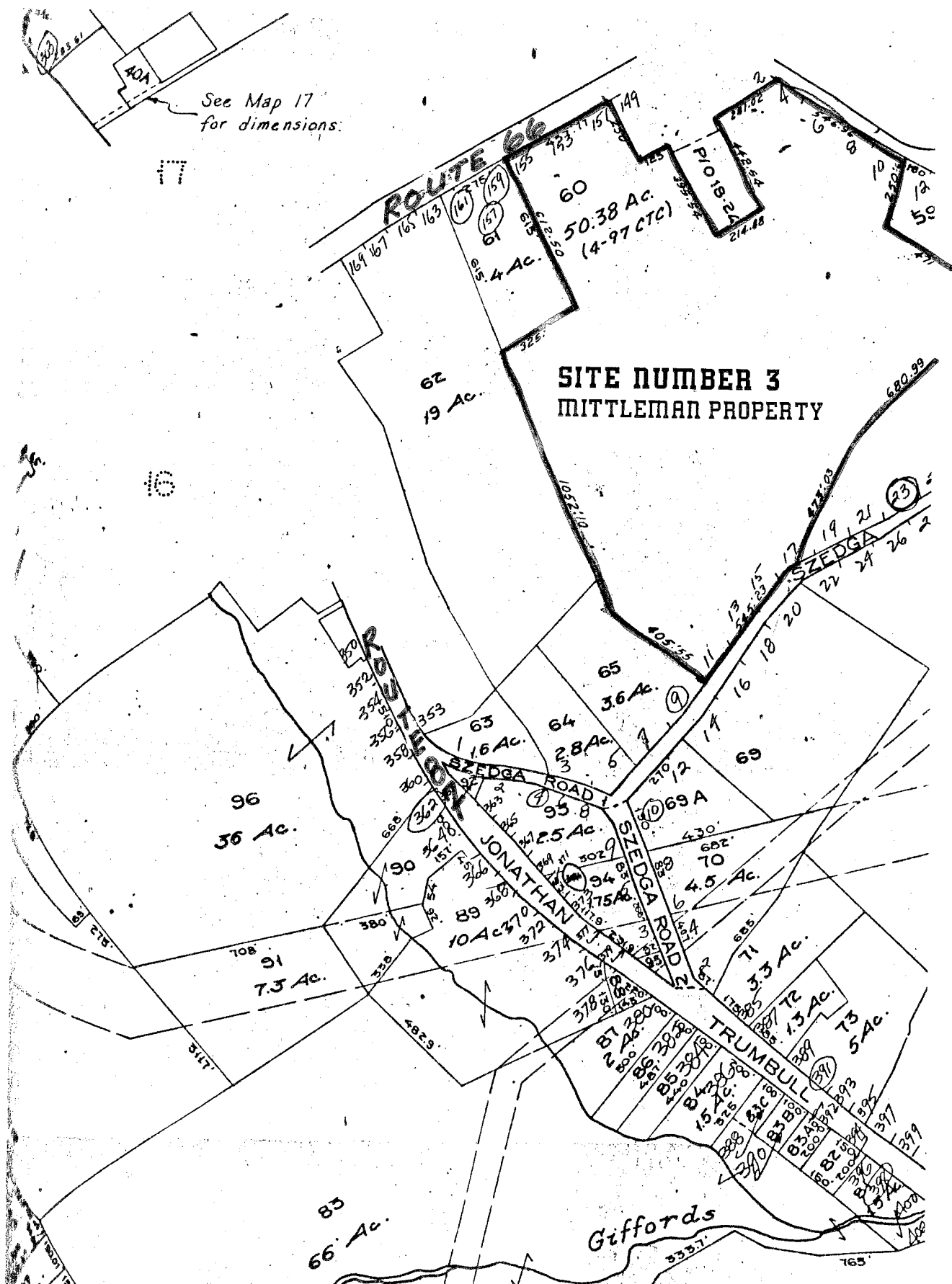
PROPERTY BOUNDARY - SITE #2

NO SCALE



PROPERTY BOUNDARY - SITE #3

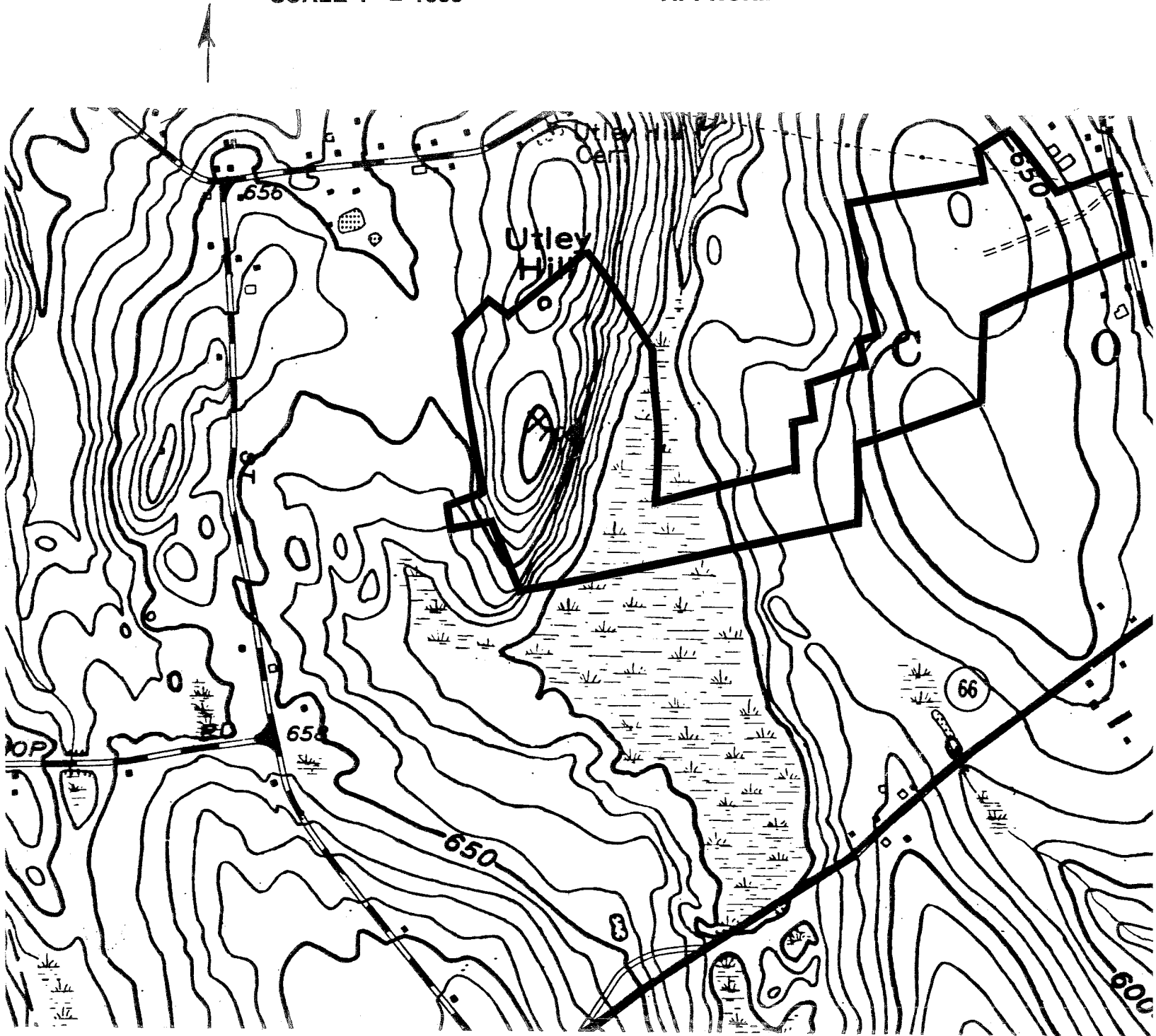
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TOPOGRAPHY

SCALE 1" = 1000'

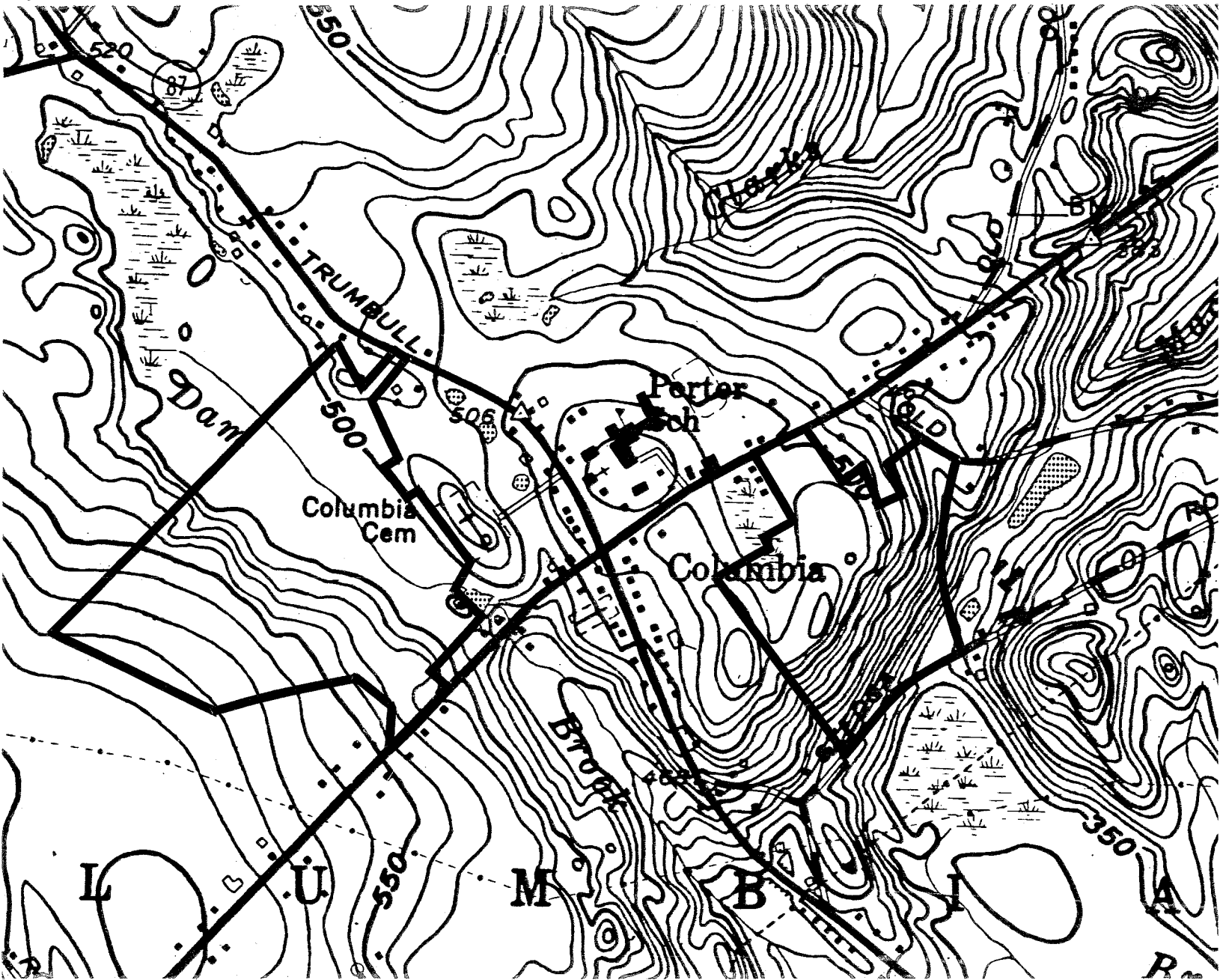
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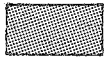
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APPROXIMATE SITE



BEDROCK GEOLOGY

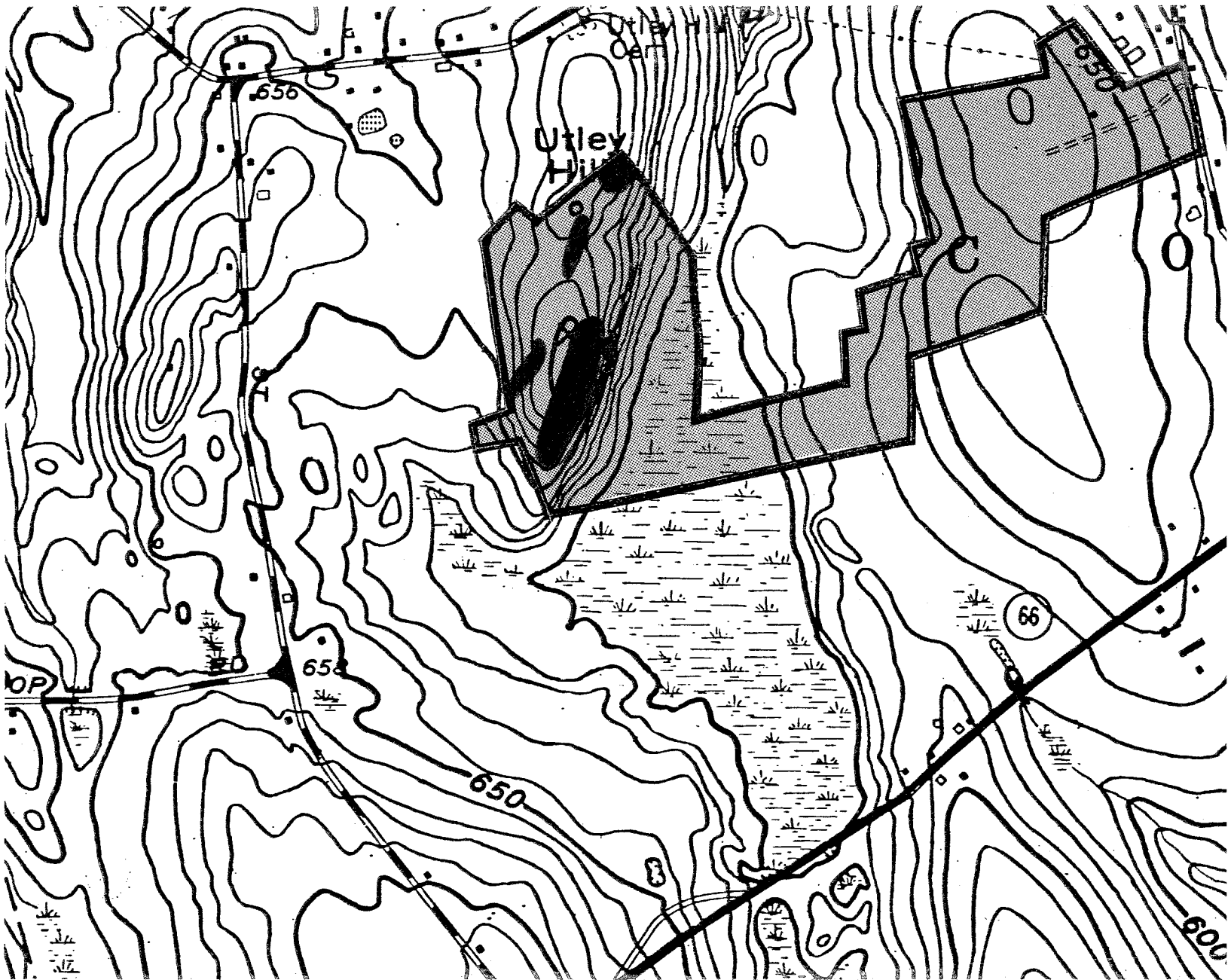
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CANTERBURY GNEISS







AREAS WHERE BEDROCK IS AT OR NEAR THE GROUND SURFACE

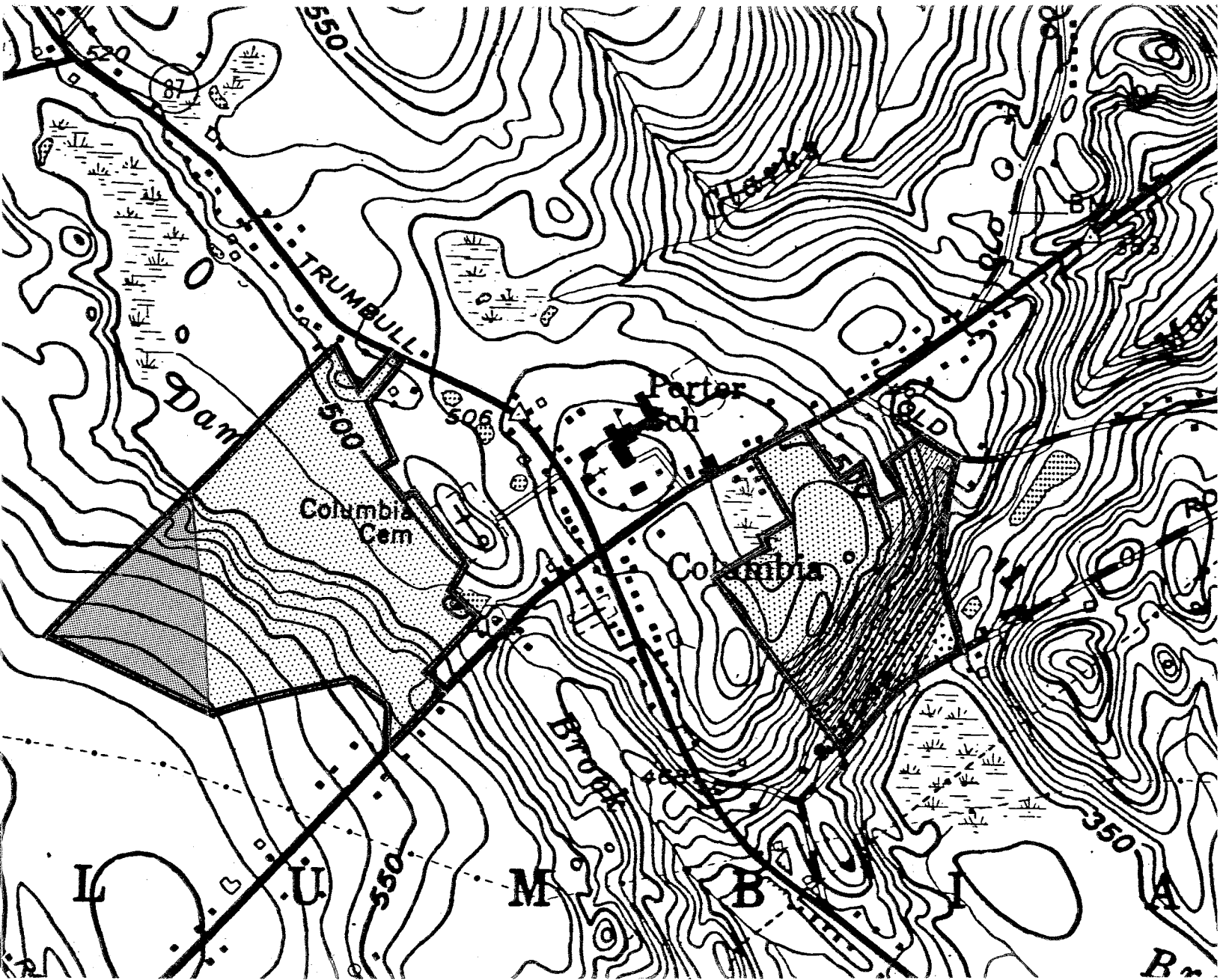


BEDROCK GEOLOGY

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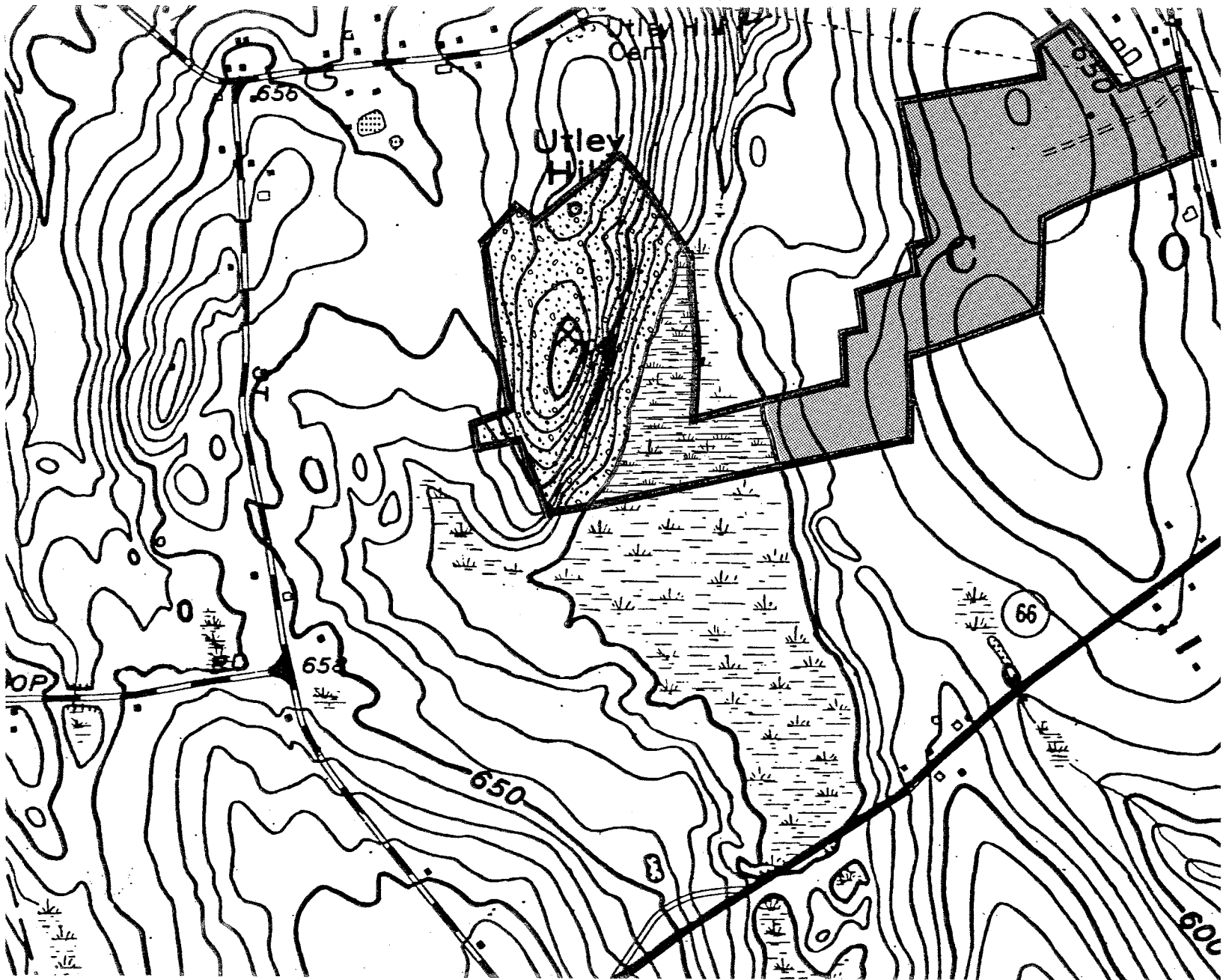
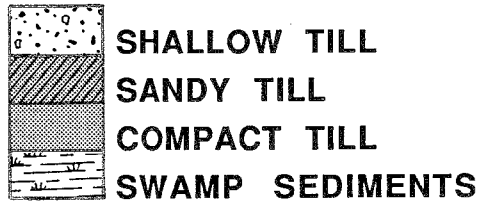


-  TATNIC HILL FORMATION (FLY POND MEMBER)
-  TATNIC HILL FORMATION (YANTIC MEMBER)
-  CANTERBURY GNEISS
-  AREAS WHERE BEDROCK IS AT OR NEAR GROUND SURFACE



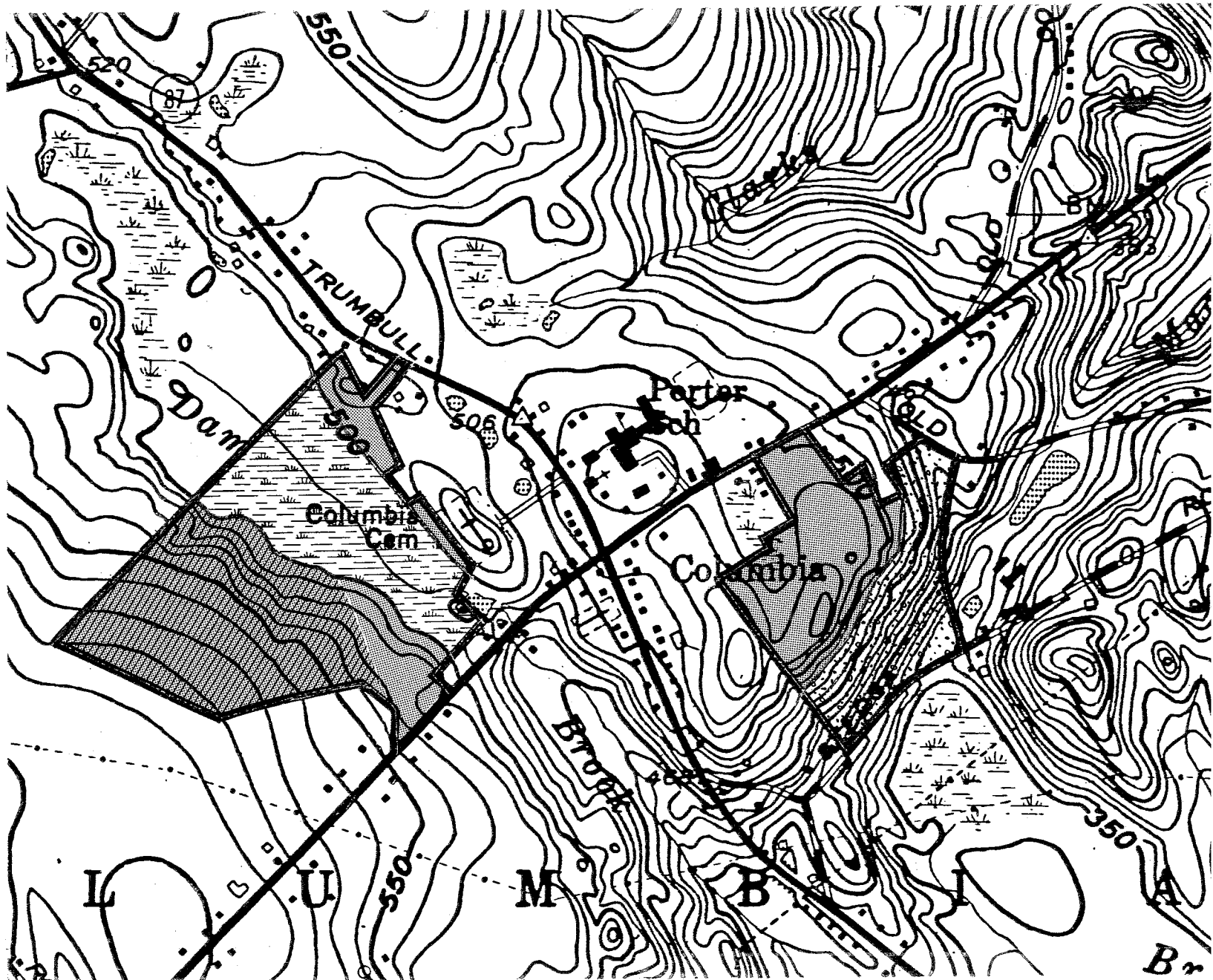
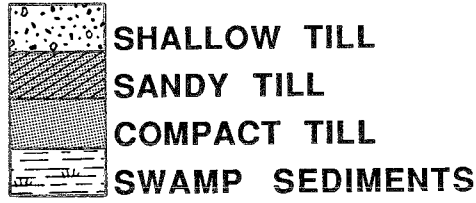
SURFICIAL GEOLOGY

SCALE 1" = 1000'



SURFICIAL GEOLOGY


SCALE 1" = 1000'




WATERSHED BOUNDARY


SCALE 1" = 1000'

 PORTION OF SITE #1 THAT DRAINS TO TOPOGRAPHIC SWALE THAT ROUTES WATER TO COLUMBIA LAKE.

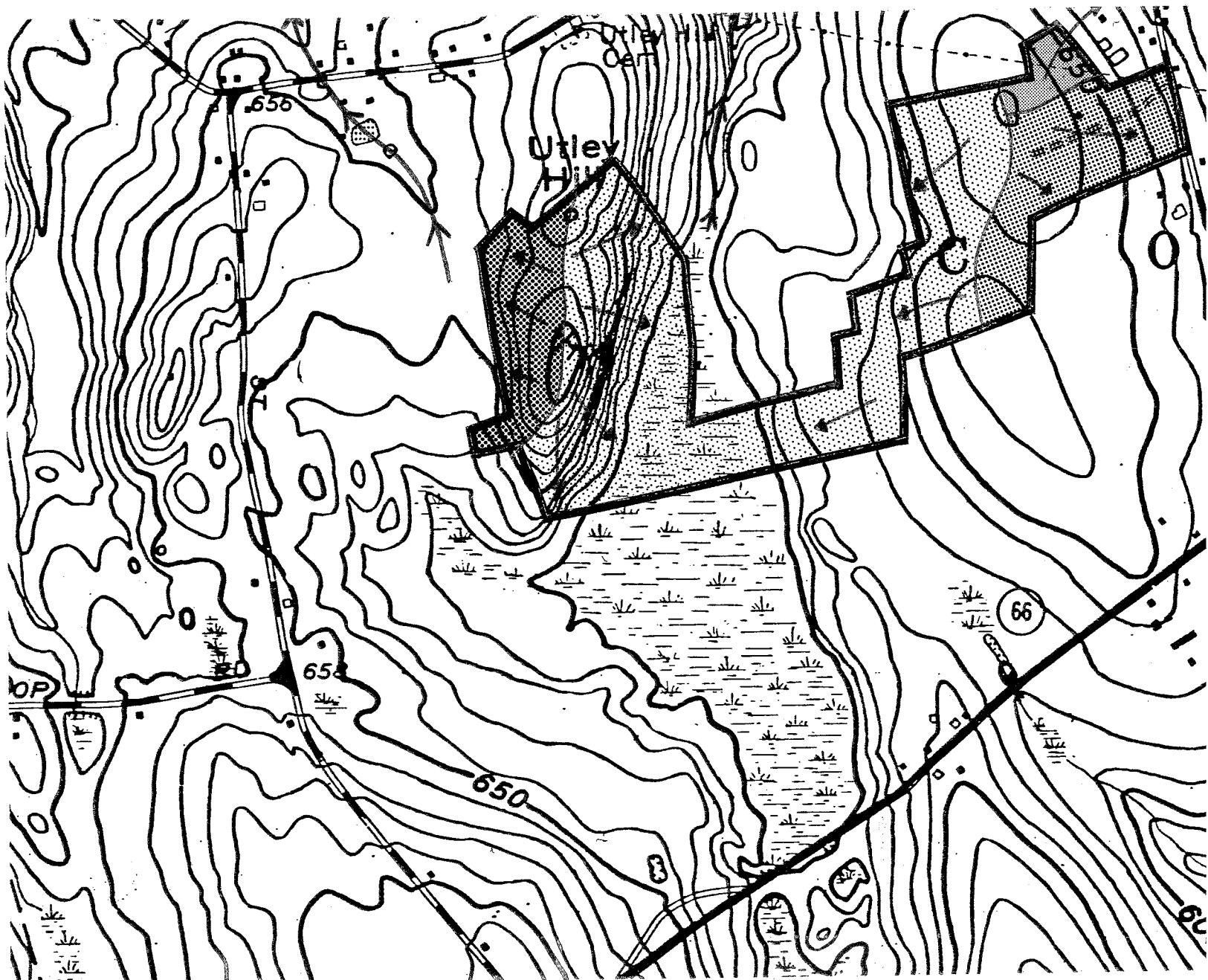
 PORTION OF SITE #1 THAT DRAINS TO THE LARGE WETLAND, WHOSE UNNAMED OUTLET STREAM ROUTES THE WATER NORTHWARD TO COLUMBIA LAKE.

 PORTION OF SITE #1 THAT DRAINS TO AN UNNAMED TRIBUTARY TO GIFFORDS BROOK.

 PORTION OF SITE #1 THAT DRAINS TO DAM BROOK.






 DIRECTION OF SURFACE FLOW

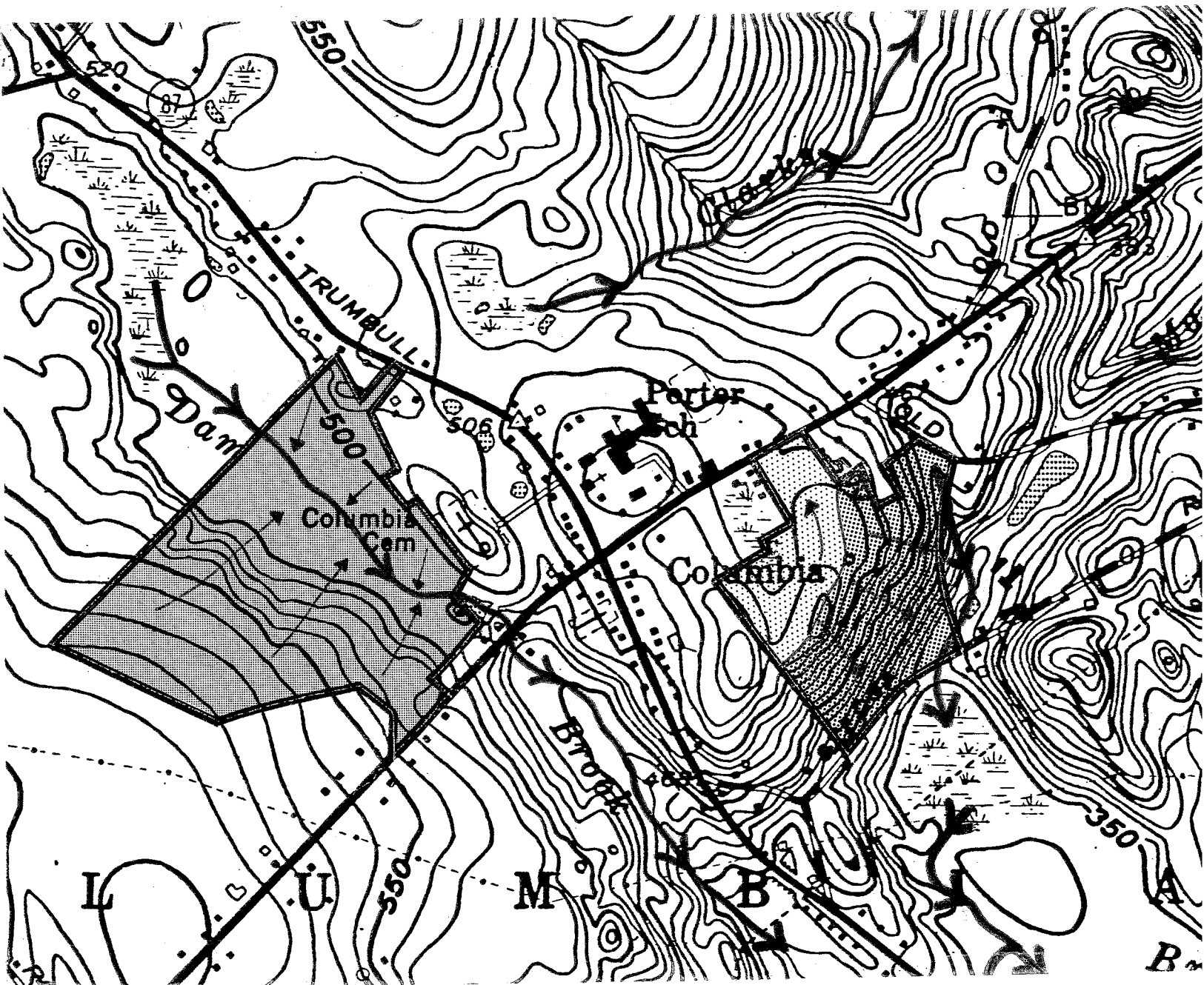
 WATERCOURSES SHOWING DIRECTION OF FLOW



WATERSHED BOUNDARY





SCALE 1" = 1000'

-  PORTION OF SITE #2 THAT DRAINS TO DAM BROOK.
-  PORTION OF SITE #3 THAT DRAINS TO AN UNNAMED TRIBUTARY TO GIFFORDS BROOK.
-  PORTION OF SITE #2 THAT DRAINS TO CLARKS BROOK.
-  DIRECTION OF SURFACE FLOW
-  WATERCOURSES SHOWING DIRECTION OF FLOW



SOILS

SCALE 1" = 1320

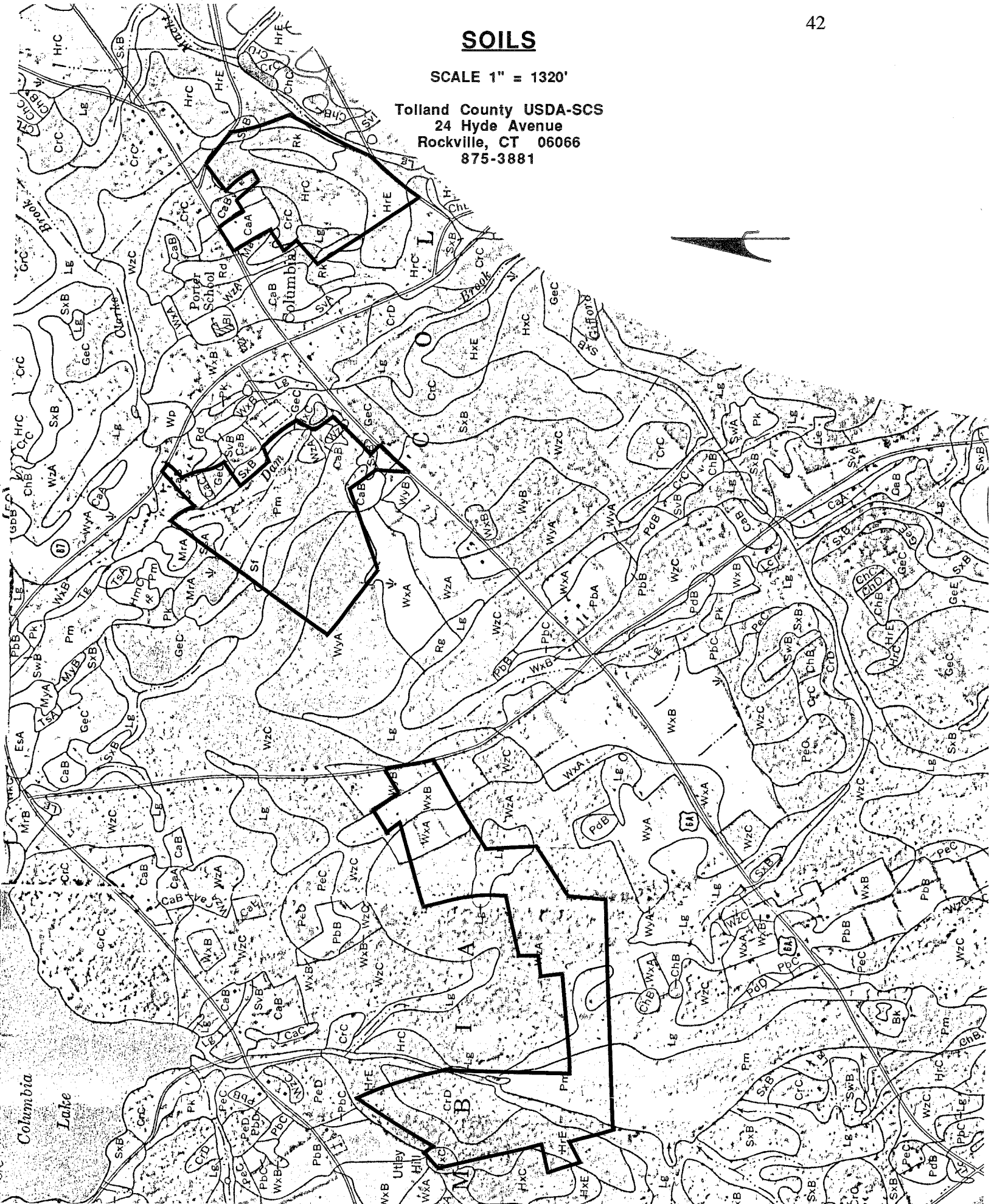
-  APPROXIMATE SITE BOUNDARIES
-  MAPPED "A" SOILS WITHIN SITE BOUNDARIES THAT APPEAR TO BE SUITABLE FOR SCHOOL SITES.
-  WETLANDS (GENERAL, REQUIRE FIELD CHECK)
-  SOILS THAT MAY HAVE SUITABLE AREAS ON ADJACENT LANDS. REQUIRES FIELD CHECK TO VERIFY.



SOILS

SCALE 1" = 1320'

Tolland County USDA-SCS
24 Hyde Avenue
Rockville, CT 06066
875-3881



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, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area --- an 86 town region.

The services of the Team are 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, landfills, commercial and industrial developments, sand and gravel excavations, 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 official 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 and the ERT Coordinator. A request form should be completely filled out and should include the required materials. 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 and request forms regarding the Environmental Review Team please contact the ERT Coordinator: **203-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.**