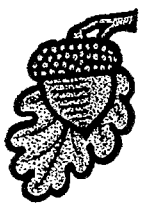
GREAT POND EXCAVATION

GLASTONBURY, CONNECTICUT

JANUARY 1989

EASTERN CONNECTICUT ENVIRONMENTAL REVIEW TEAM REPORT

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.



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REVIEW DATE: NOVEMBER 17, 1988

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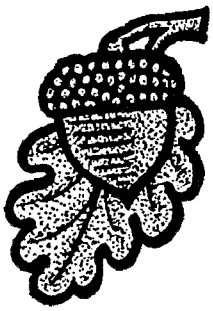

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPEMNT AREA, INC.

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ENVIRONMENTAL REVIEW TEAM REPORT
ON

GREAT POND EXCAVATION
GLASTONBURY, CONNECTICUT

This report is an outgrowth of a request from Glastonbury Conservation Commission and Inland Wetlands and Watercourses Agency to the Hartford 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 Thursday, November 17, 1988. Team members participating on this review included:

Nick Bellantoni	**State Archaeologist**	**CT Museum of Natural History**
Steve Cote	**Soil Conservationist**	**USDA-Soil Conservation Service**
Kevin DesRoberts	**Wildlife Assistant**	**DEP-Eastern District Headquarters**
Carla Harvey	**Environmental Analyst**	**DEP-Water Resources Unit**
Steve Hill	**Wildlife Biologist**	**DEP-Eastern District Headquarters**
Kip Kolesinkas	**Soil Resource Specialist**	**USDA-Soil Conservation Service**
Ken Metzler	**Senior Biologist**	**DEP-Natural Resources Center**
Brian Murphy	**Fisheries Biologist**	**DEP-Eastern District Headquarters**
Jim Parda	**Forester**	**DEP-Eastern District Headquarters**
Elaine Sych	**ERT Coordinator**	**Eastern Connecticut RC&D Area**
Carol Szymanski	**Community Dev. Planner**	**Capitol Region Council of Govmnts**
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, a soils map, an aquifer region map, Natural Areas Inventory Site information, and two maps showing surrounding land uses. During the field review the Team members were given a report done by Ken Metzler (DEP), a hydrogeologic study done for the adjacent subdivision, a limnological report, monitor well data, and more maps of the project site. The Team met with, and were accompanied by representatives from the Commission, the town Environmental Planner, a person from the Institute of Water Resources, a concerned citizen, the applicant and his engineers. 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 proposed sand and gravel excavation.

If you require additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P.O. Box 70
Haddam, Connecticut 06438
(203)345-3977

1. SETTING AND LAND-USE

The Balf Company property is comprised of 50 acres in the southwest corner of Glastonbury near its border with Portland. The site lies west of Route 17, north of Old Maids Lane, east of Tryon Street, and south of private land soon to be developed for residential purposes. The site is accessible via Potter Pond Road from the east (Rt. 17) or Tryon Street from the west. A section of the Algonquin Gas line borders the southern parts of the site. The Connecticut River is located within 125 feet of the site's western border. Scenic vistas to the west, which include the Connecticut River, are available from the top of the escarpment at the site's western limits.

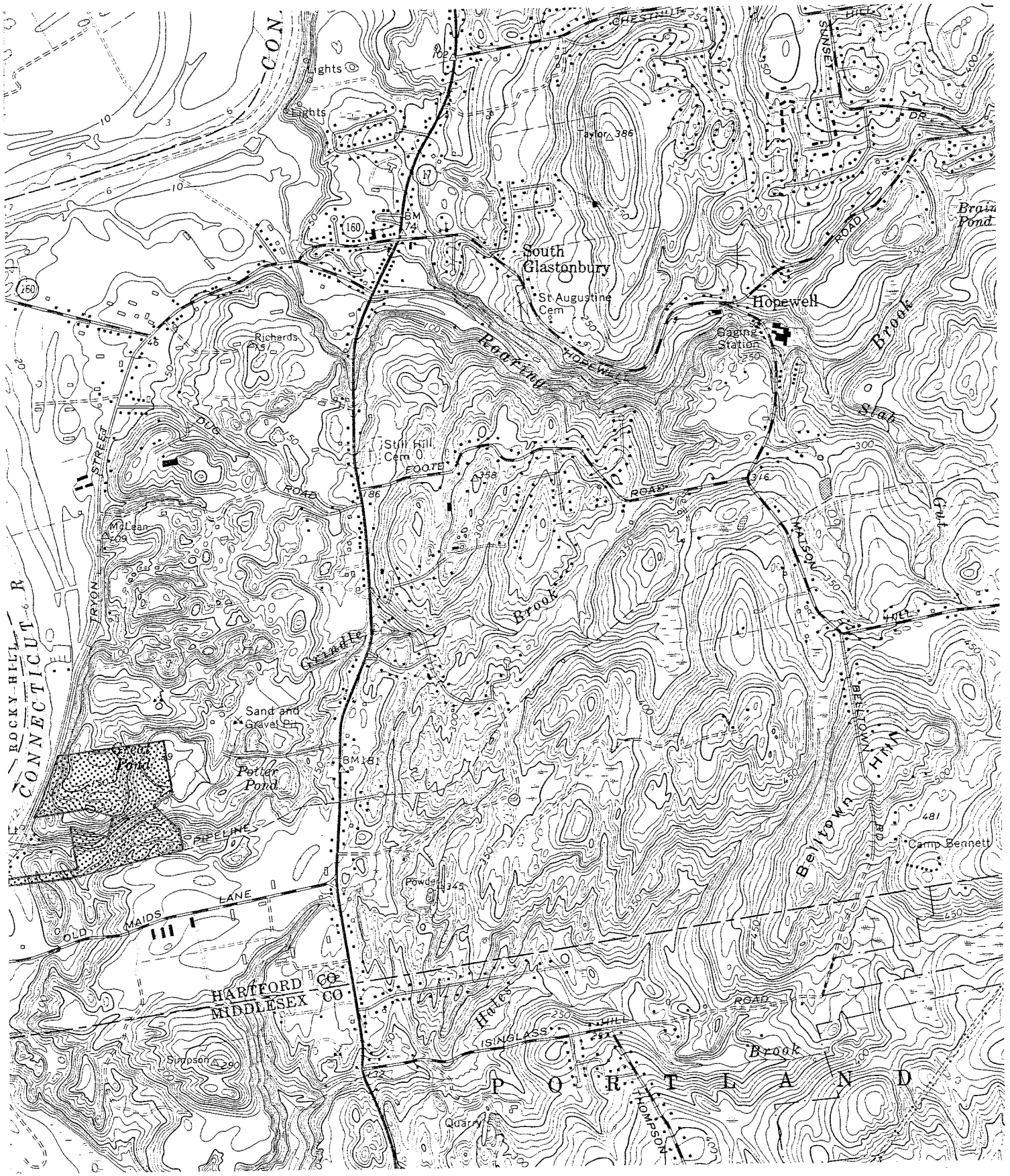
The site is located in an industrial zone. Land-uses in the vicinity of the site are largely residential but also include sizable areas of agricultural land, mainly open fields, tobacco fields, fruit orchards, and vegetable gardens. It should be pointed out that a sand and gravel mine was operated on the property north of the site for about 30 years, beginning in the late 1950's. This land was extensively disturbed and retains features resulting from the excavations. These include little or no top and subsoil, poorly-drained depressions, and relic pipes from the operation. The mining of sand and gravel by the Balf Co. is presently taking place southeast of this new subdivision and Great Pond.

Based on a review of air photos of the area since 1934, changes in area land-use during the past 54 years include a decrease in actively farmed acreage, an increase in forested acreage, and an increase in residential density.

According to town officials municipal water lines (Metropolitan District Commission) are available to the site, but not municipal sewers. Any development that takes place on the site at the present time requires the installation of on-site septic systems.

LOCATION MAP

Scale 1" = 2000'



2. TOPOGRAPHY

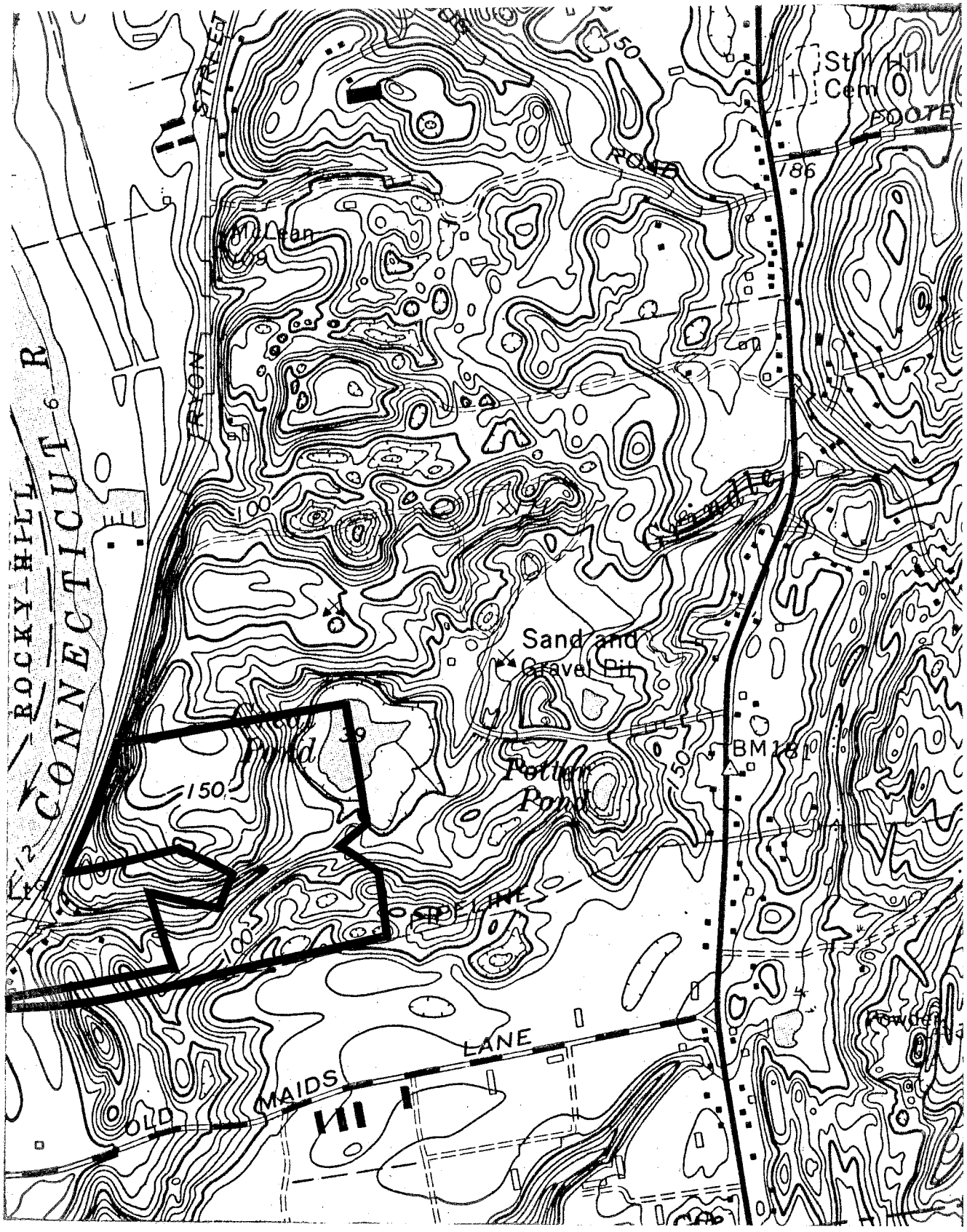
The property itself and surrounding area is dominated by the distinctive topography and geologic structures of ice-contact stratified drift (see Geology section). The land surface is characterized by hummocky and irregular topography. Slopes range from flat to very steep. The steepest slopes occur around Great Pond and at the western limits while the westcentral parts contain relatively flat, to gentle slopes.

The major topographical feature of the site is Great Pond a ±5 acre water body that occupies an earth surface feature of glacial origin known as a "kettle" hole. (See **GREAT POND** section for specific details) Two smaller "kettle" ponds, Potter Pond and an unnamed pond are located about 1200 feet to the east. Both are under one acre in size. Grindle Brook, the main feeder stream to Great Pond enters on the east side. The outlet stream for Great Pond, which was not flowing on the review day, is located at the southern end of the pond.

TOPOGRAPHIC MAP

Scale 1 " = 1000'

Approximate Site Boundary



3. GEOLOGY

The site is located about 2,300 feet west of a geologic boundary that separates two distinct groups of rock types; sedimentary and metamorphic rocks. These rocks are separated by a major fracture in Connecticut called the Eastern Border Fault. In the vicinity of the site, the fault is aligned with Route 17. The fault is a structural feature that occurred during the State's geologic past and is not believed to be experiencing active movement.

The entire site is underlain by Portland Arkose. It is described as a reddish brown arkose (brownstone). Crystalline, metamorphic rocks comprised of amphibolites, gneisses, and schists underlie the area east of Route 17. The latter rock types are much more resistant to erosional processes than the brownstones and as a result are more likely to form bedrock ridges. In fact, numerous ledgerock exposures are visible east of Route 17. Additionally, the Eastern Border Fault separates two physiographic regions of Connecticut: the Central Valley and, the Eastern Highlands. The entire site is located in the Central Valley physiographic region of Connecticut. Depth to the bedrock surface probably ranges between a few feet below ground surface near Route 17 to 200 feet below ground surface at the western limits. Based on this information and present plans, the proposed sand and excavation will not encounter the bedrock surface. [1, 2]

Bedrock on the site is overlain by unconsolidated rock material and organic debris (largely decayed vegetative matter that has accumulated in Great Pond). The bulk of the material had a glacial origin. Ice formerly flowed through Connecticut accumulating rock debris from clay-sized grains to boulders as it eroded local soil and bedrock. In most upland areas, the debris was redeposited directly from the ice without substantial reworking by water. The resulting, texturally complex sediment is known as till. Although it is not exposed at the surface of the ground, geologists believe that a thin layer of till covers the bedrock beneath the entire site.

During glacial retreat ice melted in the highlands and became restricted to valleys. Meltwater streams washed the accumulated rock particles from the stagnant portions of these ice "tongues" depositing the particles both near to and far from the ice. Where deposited near ice, the meltwater sediments, which are known as "stratified drift", principally consisted of medium to coarse grained sand and gravel. Where deposited further away or in a glacial lake, the sediments contained higher proportions of fine sand, silt and clay. The decrease in grain size was a result of the decrease in the flow energy of the meltwater as it

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[1] The Bedrock Geology of the Glastonbury Quadrangle by Norman Herz, 1955, QR-5.

[2] The Surficial Geology of the Glastonbury Quadrangle by William H. Langer, 1977, GQ-1354.

continued its journey from the ice. In addition, the manner of deposition resulted in a generally distinct stratification or layering in the sediments.

On the Balf Co. property, stratified drift is the principal surficial geologic material. The sediments, called Rocky Hill Dam deposits, consist of light-reddish brown to yellowish-brown sand and gravel, generally 15 feet thick overlying light-reddish brown sands up to 200 feet thick. These deposits contain rock particles and fragments derived from both sedimentary and metamorphic rocks. They were deposited largely by meltwater streams that built large deltas in glacial lake Rocky Hill, which occupied the area during glacial times. As a result, it contains both medium to coarse grained material as well as finer-grained material. The remnant ice was subject to variations in the rate of melting, leading to changes, often abrupt, in the size of the rock particles that were deposited.

Geologic structures of ice-contact stratified drift visible on the site are kettle holes. The term "ice-contact" refers to sediments that were deposited on, under or adjacent to wasting blocks of glacier ice. Melting of buried ice blocks caused the sediments encompassing them to collapse into irregular often deep basins. These deep basins are reflected on the earth's surface as kettle holes. Examples of kettles in the area include Great Pond, Potter Pond and the small pond north of Potter Pond. Kettle holes pit the ground surface in the vicinity south of the site. Since the last glaciation, the kettles have become accumulated with fine-grained materials, i.e., clay, silt, sand, etc. due to erosion from the surrounding watershed and organic material (vegetative matter). The deposition of these materials appears to have resulted in a buried barrier of less permeable material that "perches" water in Great Pond above the true water table. The Team's Geologist has observed hydrogeologic settings similar to the above in other parts of the State.

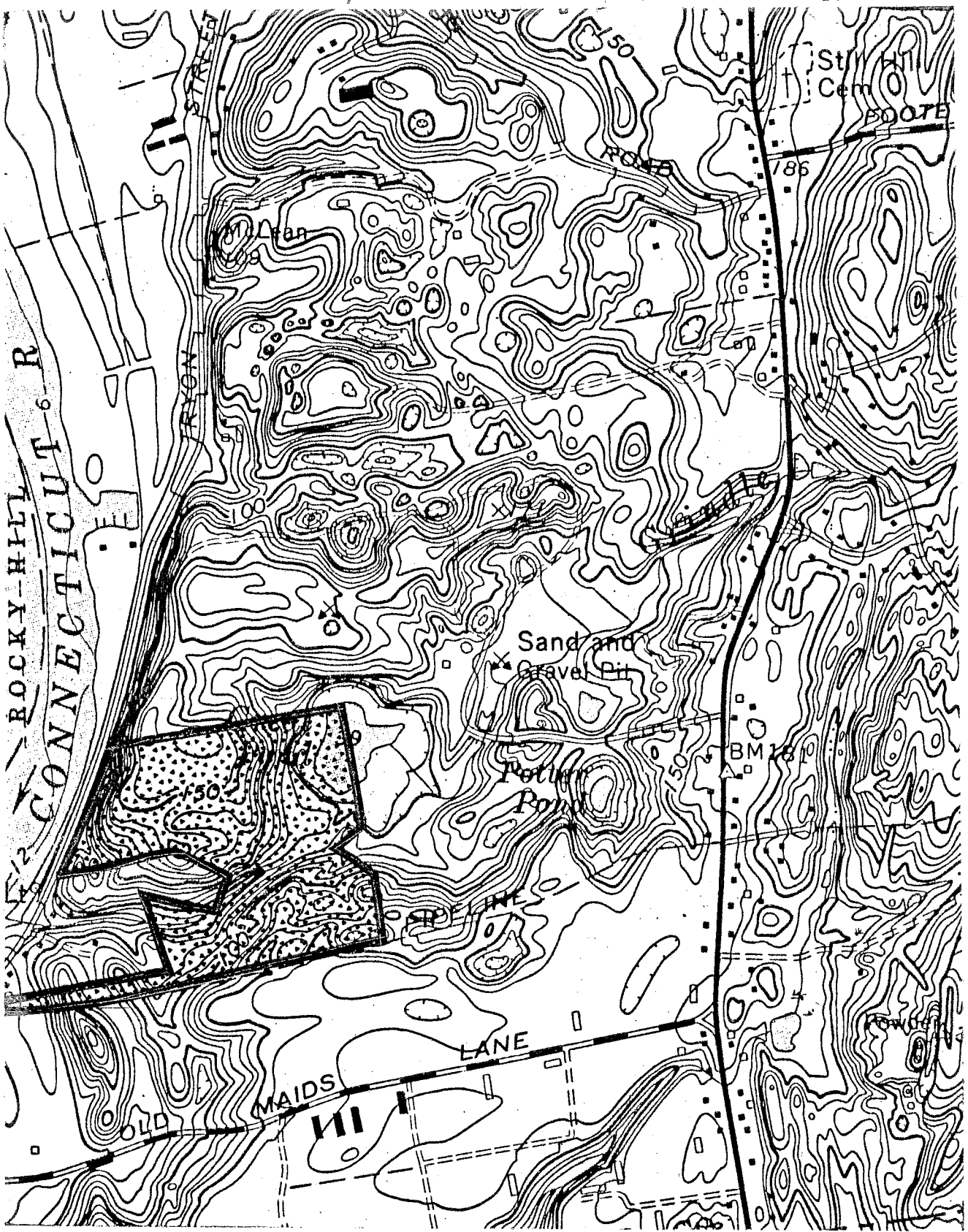
It is presumed that the sand and gravel material to be mined will be used as aggregate for construction uses and/or fill material.

GEOLOGIC MAP

Scale 1" = 1000'

Stratified Drift (Surficial Geology)

Entire site is underlain by the Portland Foramtion (Bedrock Geology)



4. SOIL RESOURCES

The proposed Balf excavation property is dominated by kame and kettle topography. The landscape is dominated by very deep, excessively drained Manchester soils on gently sloping to very steep slopes. Typically the soil has a solum of 1 to 2 feet of gravelly sandy loam to gravelly loamy sand material over a substratum of stratified sand and gravel. Included in mapping are soils with a loamier solum and soils dominated by loamy sand and sand textures within 60 inches. The seasonal highwater table is below 6 feet.

Map Units mapped include:

LmA - Limerick silt loam, 0-3% slopes

MhC - Manchester loamy sand, 3-15% slopes

MhC - Manchester gravelly sandy loam, 0-3% slopes

Tg - Terrace escarpments, sand and gravel (This unit is dominated by Manchester soils on 15-45% slopes)

A small area of silty, poorly drained floodplain soils (mapped LmA) exists where Grindle Brook enters Great Pond. No activities are planned in this area.

Generally the soils on the site are well suited to excavation for sand and gravel. Clean stratified sand and gravel are usually within 5 feet of the surface and often within 3 feet. Thus, there is only a relatively thin layer of overburden to be removed and stockpiled before sand and gravel can be excavated. However, because of the sandy and gravelly nature of these soils, and the limited amount of overburden available for site restoration, the final excavated site, particularly on steep slopes, can be difficult to stabilize. The resulting cut slopes, as shown on the plans, are long and droughty with low fertility and moisture holding capacity. It can be difficult to establish vegetation. It will be important to carefully excavate and replace the overburden.

The proposed grading plan will change how surface runoff and possibly subsurface water moves on the site. Grading could be modified to encourage infiltration.

The soils and surficial geologic material resulting from the proposed sand and gravel operation will have limitations for future land uses. Future land uses may also have an impact on Great Pond and/or

the aquifer. The resulting sand and gravel materials are poor filters for on-site septic systems or other waste disposal.

Included in this report is a copy of the soil survey map from the Soil Survey of Hartford County, 1962. The map is at a scale of 1"=1667'.

SOILS MAP

Scale 1" = 1667'

Hartford County USDA-SCS
Midway Office Park
1101 Kennedy Road, Room 105B
Windsor, CT 06095
688-7725

5. HYDROGEOLOGY

Great Pond, located on the Balf Co. site, is fed by Grindle Brook. From its point of discharge to the Connecticut River, Grindle Brook drains an area of about 1.12 square miles or 717 acres. Except for the far western limits, the Balf Co. site lies within the Grindle Brook watershed. The western limits, which mainly include the steep escarpment, drain westward to the Connecticut River. As mentioned earlier, the outlet stream (Grindle Brook) for Great Pond was not transporting water on the review day. Based on visual observations made during the field review, the water level of Great Pond would need to rise substantially before the outlet stream actually begins to drain water in Great Pond. Because of its topographic position and because of the areas hydrogeologic characteristics, it appears that the stream has probably not flowed since glacial times.

As noted earlier, the water level in Great Pond appears to be "perched" by a buried barrier of less permeable material e.g. silt, clay and/or vegetative matter.

According to a report made available to Team members entitled "Great Pond Sub-Division Water Quality and Quantity Effects on Great Pond and the Glastonbury Aquifer", May 1987, Ground Water, Inc., it is estimated that the depth to the water table in the vicinity of the subdivision site (the one that abuts the Balf Co. to the north) ranges from 40 to 80 feet, depending upon local topography. This helps to demonstrate the potential for a "perched" water table condition. Nevertheless, this can only be determined by detailed ground water monitoring, which includes observation wells. Therefore, in order to completely understand hydrogeologic conditions, e.g., depth to water table, recharge and discharge areas, ground water gradients, etc., in the area, particularly with respect to protecting surface and subsurface water, it is essential that a thorough ground water monitoring program be undertaken prior to any sand and gravel excavation operations. In addition, the study would help to determine whether or not there is a hydrologic connection between Great Pond and the true water table.

Precipitation in the form of surface runoff within the Balf Company site may flow overland (particularly during winter months) to Grindle Brook and Great Pond or it may percolate downward through the soil until it reaches the ground water table. Once it reaches the ground water table, it moves by the force of gravity towards a surface water body, wetland, or streamcourse. The water is also returned to the atmosphere through evaporation or transpiration.

The site is underlain by a stratified drift aquifer designated by the State as the Rocky Hill-Glastonbury aquifer. The aquifer is tributary to a regional valley-fill aquifer occurring along the Connecticut River and its tributaries. The aquifer has been categorized by the Connecticut DEP as

a "high" yield aquifer. This means that the aquifer may yield approximately 5 million gallons per day or greater without adversely affecting stream flow. DEP has ranked the Rocky Hill-Glastonbury aquifer as a Type II aquifer, which means it has existing or potential contamination sources/activities. The two major sources of contamination for the Rocky Hill-Glastonbury aquifer are agricultural pesticides and landfill leachate.

According to the map entitled "Ground-Water Yields for Selected Stratified Drift Areas in Connecticut"(Mazzafaro,1986), the Balf Co. site is located within a block of the Rocky Hill-Glastonbury aquifer whose long basin yield is estimated at 7.4 million gallons per day. This confirms the highly permeable and transmissive nature of the stratified drift deposits on the Balf Co. property.

Based on present plans, several tens of feet of material would be removed in the area west and southwest of Great Pond. No deleterious effects of the proposed project on ground water are anticipated unless the true water table is encountered or an accidental spillage of fuel oil occurs. Of particular concern would be hydrocarbons associated with machinery and vehicles for the mining operation. Most types of hydrocarbons such as fuel oil, gasoline, diesel fuel, etc., can be a serious source of pollution to surface and/or ground water, if proper precautions and care in operations are not taken. If they reach the ground water, they may render the water unusable for potable purposes. If the project is permitted, every effort should be made to strictly prohibit refueling on the site, forbid the storage of fuel products and maintenance of equipment and machinery on the site and provide containment areas in case of an accidental spill. This should hopefully reduce the chance of hydrocarbon contaminants from reaching the sand and gravel aquifer beneath the site.

Even if ground water is encountered, the excavation process itself should not pose any serious water quality threats. However, if the water table is at or close to the surface as a result of excavation, there would be an increased risk of ground water contamination to the aquifer from other sources, such as the heavy application of fertilizer or the development of the site for industrial purposes. As mentioned earlier, any development that takes place on the site will require the installation of on-site sewage disposal systems. One then begins to realize the potential concern for excavating too close to the true water table, as well as altering the surface flow conditions in the watershed area of Great Pond.

Another concern is the potential for illegal dumping on the site. Sand and gravel excavation areas are often vulnerable to the dumping of residential, demolition, industrial and commercial wastes. These materials may also pose a threat to ground water quality. Therefore, a

plan to secure all entrances to the property from illegal dumpers should be considered.

WATERSHED BOUNDARY MAP

Scale 1" = 1000'

Portions of the site that drains westward to the Connectciut River
Portions of the site that drains to Grindle Brook
Local watershed area for Great Pond

6. HYDROGEOLOGIC CONCERNS

Town officials asked Team members on the review day to discuss the potential water quality and hydrogeologic impacts of the proposed sand and gravel mining operation on Great Pond and the Rocky Hill-Glastonbury aquifer.

Since there is no ground water monitoring data available in the area proposed for excavation, there is no good hydrogeologic information for the site. Before town officials can properly evaluate the proposed mining activity, a complete hydrogeologic study, which includes observation wells should be conducted. The study should be conducted by a firm familiar with hydrogeology.

An accompanying map delineates the watershed boundary for Great Pond. Because of its relatively small size and predominance of steep slopes, any sand and gravel removal activity that takes place in the watershed area will obviously pose a great risk to water quality in the Great Pond. For this reason, plans for the effective control of erosion and sedimentation are essential. Erosion and siltation activity emanating from the construction site that abuts the Balf Co. property to the north and observed during the field review emphasizes the need for such planning. In addition, a review of a 1980 air photo of the area indicates that active siltation problems were occurring in Great Pond. The likely source of this material appears to have emanated from the former Balf Co. sand and gravel operation to the north. If the sand and gravel operation is permitted, the finally approved erosion and sediment control measures will need to be monitored frequently by the Town to ensure that no problems arise. Also, a careful reclamation plan for the site should be drafted as part of the approval process.

As mentioned earlier, Great Pond receives water that originates directly from precipitation, ground water recharge and/or surface runoff within the Pond's watershed. The amount of surface runoff produced within any given watershed is a result of a number of factors that include, but not limited to, the size of the watershed, soil type, ground cover, slopes, etc. Only precipitation (or meltwater from snow) falling on the Great Pond side of the watershed divide could produce surface runoff that would directly recharge the Pond. The removal of sand and gravel that takes place within the watershed limits therefore poses a potential threat to surface and subsurface runoff conditions to the Pond. It seems likely that the only way to avoid this potential problem is to prohibit the removal sand and gravel in the Great Pond watershed area.

7. EROSION AND SEDIMENT CONTROL

At the time of the field review a detailed erosion and sediment control plan was not available for review. As required by state statute and town ordinance an erosion and sediment control plan will be required for this site. The following comments are general and can be considered guidelines for soils such as those found on the site:

Soils on this site are sand and gravel deposits with a relatively thin layer of overburden (2'-4'), excessively drained and low in fertility. Special considerations include protection of Great Pond and surrounding wetlands, watercourses and watershed from sediment pollution. Adherence to these guidelines will help provide for satisfactory final stabilization of slopes and protection of wetlands.

1) All slopes should be graded to 3:1 or flatter. Slopes exceeding this gradient will be difficult to establish and maintain .

2) All disturbed areas should be permanently seeded, prepared and maintained according to guidelines such as "CT Guidelines for Soil Erosion and Sediment Control" (see Critical Area Planting - Gravel Pits, etc.). If season does not permit establishment of permanent vegetation, temporary measure should be applied.

3) Overburden and topsoil should be stockpiled separately and saved for reclamation. Wherever the overburden cannot be replaced,careful replacement with at least 4" to 6" of topsoil should be done before seeding. The exposed (overburden removed) areas should be scarified (light discing or harrowing, etc.) before applying topsoil and/or overburden. If preferred, some mixing of topsoil and exposed sideslope can be done during topsoil application. This scarification or mixing will reduce the likelihood of topsoil movement (slumping) that can result when 2 different soils having markedly different permeability rates are interfaced on steep slopes. The need for scarification increases markedly with an increase in depth of topsoil application. The topsoil applied should be free of large rocks, stumps, logs or foreign material. Overburden (and topsoil above) should be applied whenever possible.

4) All trees on the immediate top of slopes should be considered for removal due to the likelihood of windthrow, especially if they have bark or root damage or disease. Windthrown trees can cause blowouts.

5) Above the top of excavated slopes, where a gradient above exists, water should be managed by waterways, diversions or

channels to prevent an excess of water from these gradients moving downslope and causing erosion.

6) The existing plans show a proposed topography that may require consideration of detention/sedimentation areas to prevent soil movement into the watershed above Great Pond. Development of erosion and sediment control plans should consider detention/sedimentation areas and diversion of water into these areas to prevent damage to the Great Pond Watershed.

7) Haul road contours should be shown on plans to enable the determination of appropriate erosion and sediment control measures,if required.

8) A conservation easement could be considered on portions of the parcel north of Grindle Brook to protect the value of this watercourse for the future.

9) On the "Proposed Ultimate Landform" plan map, revision date 11-17-88, the Balf Co., final contours will be graded up to the 70 ft. line (and silt fence) located just west of Great Pond and north of Grindle Brook. Grading and excavation this close to the western edge of the Great Pond watershed and northern Grindle Brook watershed is not advisable. It is the opinion of the Team Soil Conservationist that a 75 ft. buffer be maintained west of the 70 ft. line (west of Great Pond) and north of this line above Grindle Brook. Grades and vegetation can be left as they exist, to help protect Great Pond and Grindle Brook fromsedimentation.

8. GREAT POND

ECOLOGICAL DESCRIPTION

Great Pond is located in a shallow kettle fed by both groundwater and surface runoff from the adjacent upland. During the winter, spring and periods of heavy rainfall, the pond contains considerable surface water; during the late summer or during droughts, much or all of the sandy bottom is exposed. Grindle Brook, flowing from the bedrock-controlled uplands to the east, is the only tributary and flows through a small red maple swamp prior to entering the pond. Much of the land to the north has been excavated for gravel and is presently under construction for residential homes. Active gravel quarrying is currently underway to the southeast, and these excavations and historic filling and diking have all influenced the present hydrology, depth and ecology of the pond.

Great Pond is related to a habitat known as "New England Coastal Plain Ponds" in both its hydrology and the vegetation on its shores. This habitat is best represented in southeastern Massachusetts and southern Rhode Island with scattered examples found inland in the sandy deposits of the Connecticut Valley in Connecticut and Massachusetts. All of these ponds occur in glacial kettles or in depressions in the irregular topography of terminal glacial moraines. In most cases, the water level in the pond is directly associated with local groundwater elevations, but in some the water table is "perched" due to a nearly impervious lining of silt, clay or peat in the sediments below the bottom of the pond. Characteristic features of these ponds are the cycles of wet and dry years flooding and exposure of the bottom sediments, and the occurrence of a number of plant species adapted to these conditions.

In Connecticut, this habitat is very restricted in its distribution, limited to two good examples in the Connecticut Valley and a handful along the southeastern and south-central coast. Of these, many are small, poorly-developed, and do not contain occurrences of species of state-wide concern. Although, historically manipulated and recently impacted by run-off from the adjacent gravel excavation, Great Pond does support a flora representative of inland occurrences of this habitat and harbors a number of plant Species of Special Concern. In addition, great Pond has been recommended as a Wetland of Special Concern in Connecticut to be included in a revised list of wetlands provided to DEP's Commissioner Leslie Carothers.

VEGETATION

The vegetation on the shores of Great Pond is extremely variable from year to year. During wet years, it is limited to the pond margins and in shallow water; during dry years, it can cover the entire exposed pond

bottom. Although not extensively inventoried, this pond was visited in 1988 twice by Connecticut Geological and Natural History Survey staff biologists. The following is a partial list of plants found on the exposed bottom of Great Pond during these visits. Two of these plants are considered Species of Special Concern by the Natural Diversity Data Base and are indicated by an asterisk.

Alisma subcordatum -	Small-flowered water plantain
*Alopecurus aqualis -	Orange Foxtail
Cyperus diandrus -	Umbrella Sedge
Eleocharis acicularis -	Spike-rush
Eleocharis obtusa -	Spike-rush
Gratiola aurea -	Golden-pert
Gratiola neglecta -	Clammy Hedge-hyssop
Juncus pelocarpus -	Rush
Ludwigia palustris -	Water Puslane
Lythrum salicaria -	Purple lodestrife
Mimulus ringens -	Square-stemmed Monkey-flower
Nuphar varigatum -	Bullhead-Lily
Penthorum sedoides -	Ditch Stonecrop
Phalaris arundinacea -	Reed Canary-grass
Phex virginica -	Common Meadow-beauty
*Rotala ramosior -	Toothcup
Scirpus cyperinus -	Wool-grass
Scirpus purshianus -	Bulrush

PROTECTION

It has been stated that coastal plain pond shores are subject to two major forms of degradation; 1) the artificial input of sediments, nutrients and runoff, and 2) artificially raising and/or lowering the water table. The vegetation and Species of Special Concern that make these habitats unique are adapted to the nutrient-poor, acidic sediments and gradual changes in the water level. Nutrient input from fertilizer leaching, on-site septic system failure and wind-blown sediments can all have a profound effect on the vegetation, changing the species assemblage over time. Water level manipulation through groundwater extraction or the direction of stormwater discharge can virtually destroy the character of the vegetation. Permanent draw-down can create favorable habitat for the invasion of woody plants. Conversely, an abrupt rise in water levels during the wrong season can submerge plants prior to their setting seed, thus eventually removing an available seed source for

recolonization. Since Great Pond has already been manipulated both historically and during present times, it is important that future encroachment does not permanently alter the remaining character of the pond.

RECOMMENDATIONS

1) Stop all sedimentation into the pond from the subdivision to the north and into Grindle Brook. This problem has been ongoing for quite some time, as evidenced in the 1971 Natural Areas Report and the November site walk. Sedimentation will eventually kill Great Pond.

2) Inventory the vegetation over a period of time to determine the diversity of species that occur on the pond shores and how it changes seasonally and yearly.

3) Conduct a hydrogeological survey of the pond to determine whether the water level is controlled solely by groundwater or if it is perched above the water table. This will be important to determine what excavation can be conducted adjacent to the pond and to what depth, without changing the ecology of the pond.

4) Study and monitor how much sedimentation has already occurred into the pond; where, to what depth, and from what source. This can be easily done by taking a series of cores along a transect across the pond and observe the depth to a buried peat layer.

5) Do not further disrupt any of the surface drainage of the pond until the above studies are done.

9. WATER RESOURCES REVIEW

The northeastern corner of the property contains an area known as Great Pond, which has been deemed significant by the Connecticut Forest and Park Association's Natural Areas Inventory. The wetlands in association with Great Pond are mapped as the poorly drained Limerick silt loam (LmA) and the very poorly drained Saco silt loam (SbA) by the USDA Soil Survey for Hartford County. Grindle Brook flows through the wetlands to the south of Great Pond and subsequently into the Connecticut River.

Situated in a deep glacial kettle hole, Great Pond, its bordering wetlands and the adjacent pitch pine forest community are an excellent wildlife habitat; providing an open water body, emergent shrub areas, a stream channel and a dense forest. This diversity of vegetative communities increases the diversity of wildlife species utilizing this region for feeding, resting. shelter and reproductive activities.

The maintenance of the watershed of Great Pond is important for the protection of the natural resources that Great Pond and the surrounding wetlands provide. Therefore, it is recommended that any further excavation in the vicinity of Great Pond be conducted outside of the watershed area.

The properties to the east and south are the locations of on-going sand and gravel excavations. Northeast of the Great Pond site is the location of a new subdivision currently being constructed. As a result of some of the filling and grading activities of this subdivision along the banks of Grindle Brook, an accumulation of sediments up to six inches in depth has occurred along the fringes of the wetlands. Given that this kind of disturbance has already occurred, it is felt that further activities in the watershed of Great Pond would significantly degrade the ecological integrity of the area.

10. VEGETATION

TYPE DESCRIPTION

Type 1: ***Field, 2 acres.*** Grass.

Type 2: ***Softwood - Hardwood, 5 acres.*** Eastern red cedar, oaks, red maple, black birch. Red cedar composes 75% of this type. Trees are sapling and poletimber size (4"-10" diameter at 4 1/2 feet above ground line).

Type 3: ***Mixed hardwood, 10 acres.*** The overstory is composed of poletimber sized red maple, sugar maple, black and red oak, black locust black cherry, black birch, aspen, grey birch. The understory is composed of poison ivy, honey suckle, raspberry, barberry, virginia creeper.

Type 4: ***Softwood, 33 acres.*** This type is composed of 90% hemlock and occasional white pine with red and white oak, beech and black birch comprising the remaining 10% of the tree cover. The understory is bare except where past tree mortality has allowed black birch or hemlock regeneration to become established. About half of this type is on slopes greater than 25%.

Forest land provides a protective influence on soil stability and water quality by reducing the impact of precipitation and run off, moderating the effects of adverse weather conditions and stabilizing soils. Forest land also reduces erosion, sedimentation, siltation and flooding as soils protected by the roots and humus/litter layer contribute little or no sediment to streams.

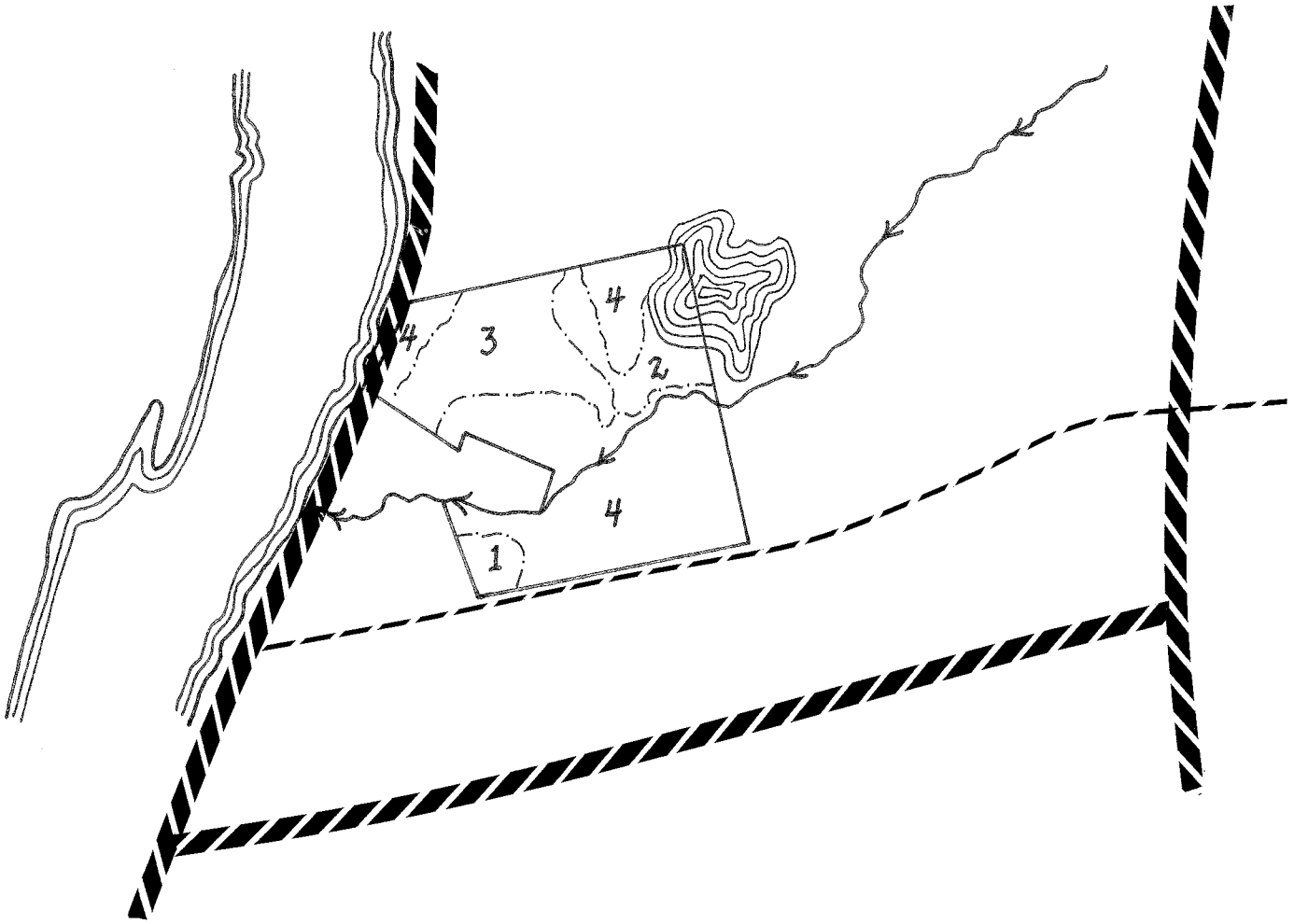
VEGETATION MAP

Type 1: 2 acres, field

Type 2: 5 acres, softwood-hardwood

Type 3: 10 acres, mixed hardwoods

Type 4: 33 acres, softwood



Scale 1" = 1000'
Boundary
Type Boundary
Pipeline
Grindle Brook

11. WILDLIFE RESOURCES

WILDLIFE HABITAT DESCRIPTION

The area of the proposed sand and gravel excavation is composed of three major habitat types; mixed hardwoods, coniferous forest and wetland/riparian areas. Due to the unique topography of the area and transition of habitat types this area currently offers a variety of cover types that support a number of wildlife species.

Mixed hardwoods occupy the ridge west of Great Pond. The overstory is dominated by black locust, black oak, red cedar, white oak, black cherry, and red maple. the understory is dense in some areas and consists of tartarian honey suckle, blackberry, black cherry seedlings, red maple seedlings, sassafrass, oak seedlings, and viburnum.

On the ridge adjacent to the gas pipeline eastern hemlock dominates the overstory, with beech, black birch, and red cedar occurring in some areas. The understory is sparce and consists primarily of hemlock saplings, beech seedlings, and mountain laurel. Golden crowned kinglets, black-capped chickadees and red squirrels were observed inhabiting this area.

Wetland/riparian habitat is comprised of Great Pond, a wetland associated with the pond, and Grindle Brook. An assessment of the ecology of Great Pond is provided by Priscilla W. Ballie, Marine and Freshwater Research Service. Grindle Brook appears to be dry most of the year and currently offers limited wildlife use. The forest edge adjacent to the pond and wetland is dominated by multiflora rose, morrow honey suckle, red cedar, red maple, grape, and bittersweet.

WILDLIFE SPECIES

Bird species inhabiting the area include black-capped chickadees, white breasted nuthatches, golden crowned kinglets, ruffed grouse, great horned owl, sparrows, and a variety of other song birds, waterfowl, and waterbirds.

Mammalian species consist of white-tailed deer, red squirrels grey squirrels, raccoons, eastern cottontails, red fox, muskrat, mink, and a variety of other small mammals.

Due to the existence of the pond and wetland, this area also supports a number of amphibian and reptilian species.

IMPACTS OF EXCAVATION ON WILDLIFE

Excavation will occur in the area west of Great Pond. Since excavation involves the removal of vegetation, there will be a negative

impact on wildlife occupying this area. Vegetation removal will reduce the present habitat diversity which will in turn reduce species diversity and richness. Species occupying the mixed hardwood type habitat will be forced to emigrate into adjacent areas. Species dispersion into adjacent habitats may result in competition with species already occupying the area. Many species will also be forced to inhabit less desirable habitat; decreasing survivorability. During excavation the noise generated by heavy equipment may also disturb wildlife species occupying adjacent areas and cause a decrease in habitat utilization.

Since excavation will occur adjacent to Great Pond, there may be negative impacts on the pond. An open gravel pit creates a high risk for erosion as well as allowing transportation of sediment by wind currents, resulting in sediment being deposited in the pond, adjacent wetlands and Grindle Brook. This may alter the present ecological structure of the pond and reduce species diversity. The section along the west bank of the pond that is proposed to be given to the town will reduce siltation and disturbance if no vegetation removal takes place.

The construction of a temporary haul road may cause disturbance to wildlife utilizing Great Pond. The road would be within 100 feet of the southern shore of the pond and the noise generated by heavy equipment will be intolerable to some species of wildlife.

There will be little impact on the wildlife habitat in the area adjacent to the gas pipeline if this area is given to the town as proposed.

MITIGATION OF IMPACTS ON WILDLIFE

Several measures can be taken to minimize the impact of excavation on wildlife. A 100 foot buffer should be established along Grindle Brook in which no vegetation removal should take place. This buffer strip combined with the proposed installation of silt fences will help limit siltation to Grindle Brook. Vegetation should be re-established to stabilize the soil prior to excavation. Allowing the site to revegetate would be beneficial to wildlife and enhance the area aesthetically. When constructing the hauling road, vegetation removal should be kept to a minimum and vegetation should he replaced upon termination of road use.

12. FISH RESOURCES

It is doubtful that viable fish populations exist in Great Pond since this kettle pond has periodically dried up or experienced reduced water levels. It also apparent that water within the pond's outlet, Grindle Brook, would flow only if the water level of Great Pond rose to the elevation of the outlet stream.

The main fisheries concern at this site is that runoff from sand and gravel excavation areas may enter Great Pond, Grindle Brook and associated wetlands. Moreover, because Grindle Brook outlets directly into the Connecticut River, there is a potential that uncontrolled runoff from the proposed development site may be discharged into the Connecticut River. Runoff in the form of silt/sediment can degrade fish habitat, reduce fish and aquatic insect survival, and contribute to the depletion of dissolved oxygen. Given this scenario, impacts to aquatic environments can be minimized by implementing the following suggested recommendations:

1. Install and maintain proper erosion and sedimentation controls during excavation activities; this includes such mitigative measures as silt fences, hay bales, and catch basins.

2. Maintain at the **minimum** a **100** foot open space **buffer zone** along the wetland boundary that borders Great Pond and Grindle Brook; no construction or alteration of natural habitat shall take place in this zone, otherwise the abilty of the buffer zone to function properly will be reduced. Research has shown that 100 foot buffer zones will protect aquatic resources by helping to prevent surface runoff and other pollutants from entering.

13. LAND USE CONSIDERATIONS

EXISTING CONDITIONS

The Glastonbury zoning regulations permit sand and gravel excavation operations in all zones by Special Permit under Section 6.2. The proposed operation in its entirety is located in an Industrial Zone; the land area bordering to the south is zoned Industrial as well, and the land directly to the north is zoned Rural Residential.

North of the proposed site is a recently approved subdivision of 130 lots. It is a former Balf Company excavation site. Public water and on- site septic systems will serve the development.

Potter Pond Road which intersects with Route 17 will be improved for the subdivision. A second means of egress, also intersecting Route 17, is proposed to the north. The gravel pit operation will utilize part of Potter Pond Road at Route 17 for about 1500 feet until the road splits: a "temporary haul road" follows the southern perimeter of Great Pond into the gravel operation; Potter Pond Road will be extended north of Great Pond to service the subdivision.

ZONING CONSIDERATIONS

The Regional Plan of Development classifies this area as "Rural". Likewise, Glastonbury's Plan of Development classifies this site and the surrounding area as "Rural". This classification notes the "...rugged topography (and) steep slopes..." which characterize this site.

At this point in time, the approving town agency should review its "Industrial" zoning designation for this site which is inconsistent with the Regional and Town Plans of Development. If the town chooses to approve this proposal, it may wish to simultaneously rezone the site for rural residential use to ensure its future compatibility with the surrounding area. (NOTE: Since excavation is permitted by special permit in all zones, a residential zoning designation would not impact this proposal.)

TRAFFIC CONSIDERATIONS

Based on a traffic study performed by Hesketh Associates at the intersection of Potter Pond Road and Route 17 in Glastonbury, Kauzem Baihaghy, Senior Traffic Engineer at CRCOG performed an analysis of the traffic impact of the proposed gravel pit operation. (The results are included in this section).

According to a Balf Company representative, a maximum of 10 (ten) trucks would be hauling sand and gravel for 7 (seven) round trips per day.

The **TABLE 1** analysis charts existing conditions at the intersection of Potter Pond Road and Route 17: The intersection is operating at a Level of Service "A" for Northbound traffic on Route 17 and Level of Service "A" for right-turning traffic exiting Potter Pond Road onto Route 17. A Level of Service "C" is indicated for Eastbound traffic exiting Potter Pond Road onto Route 17.[1]

The above standards are replicated for the A.M. Peak hour once the sand and gravel traffic is added to the intersection. (**TABLE 2**) Therefore, no negative impacts are projected for the A.M. Peak hour.

However, protections for the P.M. Peak hour (one hour between 4 P.M. and 6 P.M.) indicate that the Level of service for Eastbound traffic would drop to a Level of "D." (**TABLE 3**) While this rating is still acceptable according to the State Department of Transportation, the approving town commission may wish to consider shortening the allowable hours of P.M. operation for the proposed land use. The zoning regulations currently permit sand and gravel operations to be active between the hours of 7 A.M. and 6 P.M., Monday through Saturday.

SITE ACCESS

The zoning regulations require access roads to be paved for a certain distance from the public street. However, the temporary haul road is proposed as a gravel road. A waiver if necessary should be granted. If the gravel layer is maintained, it will prevent mud tracking onto Potter Pond Road (eventually to be accepted as a town road). However, if it is not maintained, other solutions should be explored to perform this function: a "construction pad entrance" could be created and maintained at the point where the haul road meets the paved edge of Potter Pond Road or a tire washing area could be installed.

A gate or other suitable barrier should be installed at the entrance of the site to prevent uncontrolled public access as required by the zoning regulations.

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[1]Levels of service are defined as follows based on the average stopped delay of approaching vehicles at an intersection. (Highway Capacity Manual, 4th Edition Report 209)

LOS A: Very low delay, less than 5 seconds per stopped vehicle.
LOS B: Short delay, between 5 to 25 seconds per stopped vehicle.
LOS C: Average delay, between 15 to 25 seconds per stopped vehicle.
LOS D: Congestion becomes noticeable, delay between 25 and 40 seconds per stopped vehicle.
LOS E: Limit of acceptable delay, between 40 to 60 seconds per stopped vehicle.
LOS F: Unacceptable to most drivers. Delay in excess of 60 seconds per stopped vehicle.

ENVIRONMENTAL CONSIDERATIONS

An Erosion and Sediment Control Plan should be submitted by the applicant. Monitoring this site for compliance with the erosion and sedimentation plan will be crucial. The town should consider requiring the developer to submit progress reports on a regular basis. Placing this responsibility on the developer will make best use of town staff time to review progress reports and make "spot checks" for compliance.

None of the town land use regulations appear to address setback distances from environmentally sensitive areas. Perhaps the town agency regulating wetlands should devise and adopt specific setback distances from wetlands and watercourses.

In order to minimize the amount of soil exposure for long periods of time, the developer should devise a "phasing plan" to indicate areas to be disturbed. A site-specific "restoration plan" should also be submitted to the town to indicate how the site will be stabilized as mined areas are abandoned.

A single crossing of Grindle Brook with the temporary haul road is necessary to access the proposed sand and gravel site. No "feasible and prudent" alternative appears to exist. Sound engineering data should be submitted to the town on the acceptability of the two proposed 48" RCP pipes.

NOISE

The Noise Control Unit at the Department of Environmental Protection was contacted and the Team Planner received a copy of their Noise Control regulations.

Sand and gravel mining operations are not addressed under these regulations. If a gravel processing operation were proposed on site in conjunction with the mining use, certain noise standards would have applied under those regulations. However, it is understood that the gravel will be trucked to Balf's Newington, CT site for processing.

Although the zoning regulations raise the issue of "noise levels" as a concern in evaluating excavation operations, no enforceable standards exist. If the Commission is interested in developing Noise regulations at a later date, Joseph Pulaski at DEP can be contacted for assistance, his number is 566-7494.

RECOMMENDATIONS

1. Rezone the site for residential use to ensure its future compatibility with the surrounding area.

2. If traffic congestion becomes a problem when the subdivision is completed, shorten the allowable hours of P.M. operation for the proposed land use.

3. If mud tracking onto a public road becomes a nuisance, require that a "construction pad entrance" be created and maintained at the point where the haul road meets the paved edge of Potter Pond Road or that a tire washing area be installed.

4. A gate or other suitable barrier should be installed at the entrance of the site to prevent uncontrolled public access as required by the zoning regulations.

5. An Erosion and Sedimentation Plan should be submitted by the applicant.

6. The developer should submit progress reports on a regular basis to town staff regarding compliance with erosion and sedimentation control plan.

7. It is the opinion of the Team Planner that the Conservation Commission should devise and adopt specific setback distances from wetlands and watercourses. Any activity proposed within that distance will then clearly be a regulated activity.

8. The developer should devise a "phasing plan" to indicate areas to be gradually disturbed.

TABLE 1 - EXISTING CONDITIONS

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

****

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55

PEAK HOUR FACTOR..... .85

AREA POPULATION..... 50000

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.

NAME OF THE NORTH/SOUTH STREET..... Route 17

NAME OF THE ANALYST..... Kauzem B.

DATE OF THE ANALYSIS (mm/dd/yy)..... 11-25-88

TIME PERIOD ANALYZED..... AM. peak hr.

OTHER INFORMATION...Background

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	7	--	4	0
THRU	0	--	387	257
RIGHT	11	--	0	2

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	--	2	1

TABLE 1

ADJUSTMENT FACTORS Page--2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	-----	---	---	-
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	---	---	---
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	EB	6.50	6.50	0.00	6.50
MAJOR LEFTS	NB	5.50	5.50	0.00	5.50
MINOR LEFTS	EB	8.00	8.00	0.00	8.00

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.
NAME OF THE NORTH/SOUTH STREET.... Route 17
DATE AND TIME OF THE ANALYSIS..... 11-25-88 ; AM. peak hr.
OTHER INFORMATION....

TABLE 1

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
EB LEFT	9	221	221	> 221 > 366	> 211 > 343	> C >B
RIGHT	14	632	632	> 632	> 618	> A
MAJOR STREET						
NB LEFT	5	786	786	786	781	A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.
NAME OF THE NORTH/SOUTH STREET.... Route 17
DATE AND TIME OF THE ANALYSIS..... 11-25-88 ; AM. peak hr.
OTHER INFORMATION....

TABLE 2 - A.M. PEAK CONDITIONS POST-DEVELOPMENT

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

****

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55

PEAK HOUR FACTOR..... .85

AREA POPULATION..... 50000

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.

NAME OF THE NORTH/SOUTH STREET..... Route 17

NAME OF THE ANALYST..... Kauzem B.

DATE OF THE ANALYSIS (mm/dd/yy)..... 11-25-88

TIME PERIOD ANALYZED..... AM. peak hr.

OTHER INFORMATION.... Combined Traffic Volumes

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	11	--	10	0
THRU	0	--	387	257
RIGHT	17	--	0	6

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	--	1	1

TABLE 2

ADJUSTMENT FACTORS Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	-----	---	---	-
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	---	---	---
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	EB	6.50	6.50	0.00	6.50
MAJOR LEFTS	NB	5.50	5.50	0.00	5.50
MINOR LEFTS	EB	8.00	8.00	0.00	8.00

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.
NAME OF THE NORTH/SOUTH STREET.... Route 17
DATE AND TIME OF THE ANALYSIS..... 11-25-88 ; AM. peak hr.
OTHER INFORMATION.... Combined Traffic Volumes

TABLE 2

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
EB LEFT	14	217	215	> 215	> 201	> C
				> 358	> 322	>B
RIGHT	22	631	631	> 631	> 609	> A
MAJOR STREET						
NB LEFT	13	782	782	782	769	A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.
NAME OF THE NORTH/SOUTH STREET.... Route 17
DATE AND TIME OF THE ANALYSIS..... 11-25-88 ; AM. peak hr.
OTHER INFORMATION.... Combined Traffic Volumes

TABLE 3 - P.M. PEAK CONDITIONS POST-DEVELOPMENT

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

****

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55

PEAK HOUR FACTOR..... .85

AREA POPULATION..... 50000

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.

NAME OF THE NORTH/SOUTH STREET..... Route 17

NAME OF THE ANALYST..... Kauzem B.

DATE OF THE ANALYSIS (mm/dd/yy)..... 11-25-88

TIME PERIOD ANALYZED..... PM.Peak

OTHER INFORMATION.... Combined Traffic Volumes

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	7	--	19	0
THRU	0	--	263	378
RIGHT	14	--	0	10

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	--	2	1

TABLE 3

ADJUSTMENT FACTORS Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	-----	---	---	-
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	---	---	---
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	EB	6.50	6.50	0.00	6.50
MAJOR LEFTS	NB	5.50	5.50	0.00	5.50
MINOR LEFTS	EB	8.00	8.00	0.00	8.00

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.
NAME OF THE NORTH/SOUTH STREET.... Route 17
DATE AND TIME OF THE ANALYSIS..... 11-25-88 ; PM.Peak
OTHER INFORMATION.... Combined Traffic Volumes

TABLE 3

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_P (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)		SHARED CAPACITY c_{SH} (pcph)		RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET								
EB LEFT	9	213	208	>	208	>	199	> D
				> 349		> 321		>B
RIGHT	18	526	526	>	526	>	508	> A
MAJOR STREET								
NB LEFT	25	659	659		659		634	A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Potter Pond Rd.
NAME OF THE NORTH/SOUTH STREET.... Route 17
DATE AND TIME OF THE ANALYSIS..... 11-25-88 ; PM.Peak
OTHER INFORMATION.... Combined Traffic Volumes

14. ARCHAEOLOGICAL REVIEW

The State of Connecticut Archeological Site Files and Maps show a series of prehistoric sites situated on the east bank of the Connecticut River in this section of southern Glastonbury. These prehistoric sites date from over 4,000 to 500 years ago. These sites also represent a variety of settlement types from large multi-component base camps to smaller site-specific locations (i.e., hunting activities). No sites are recorded for the project area. However, the environmental parameters of the area suggest a high probability for prehistoric cultural resources.

The Great Pond, a kettle hole formation, and Grindle Brook flowing into the Connecticut River would have provided prehistoric peoples with an ideal environmental setting for the exploitation of a series of plant and animal species.

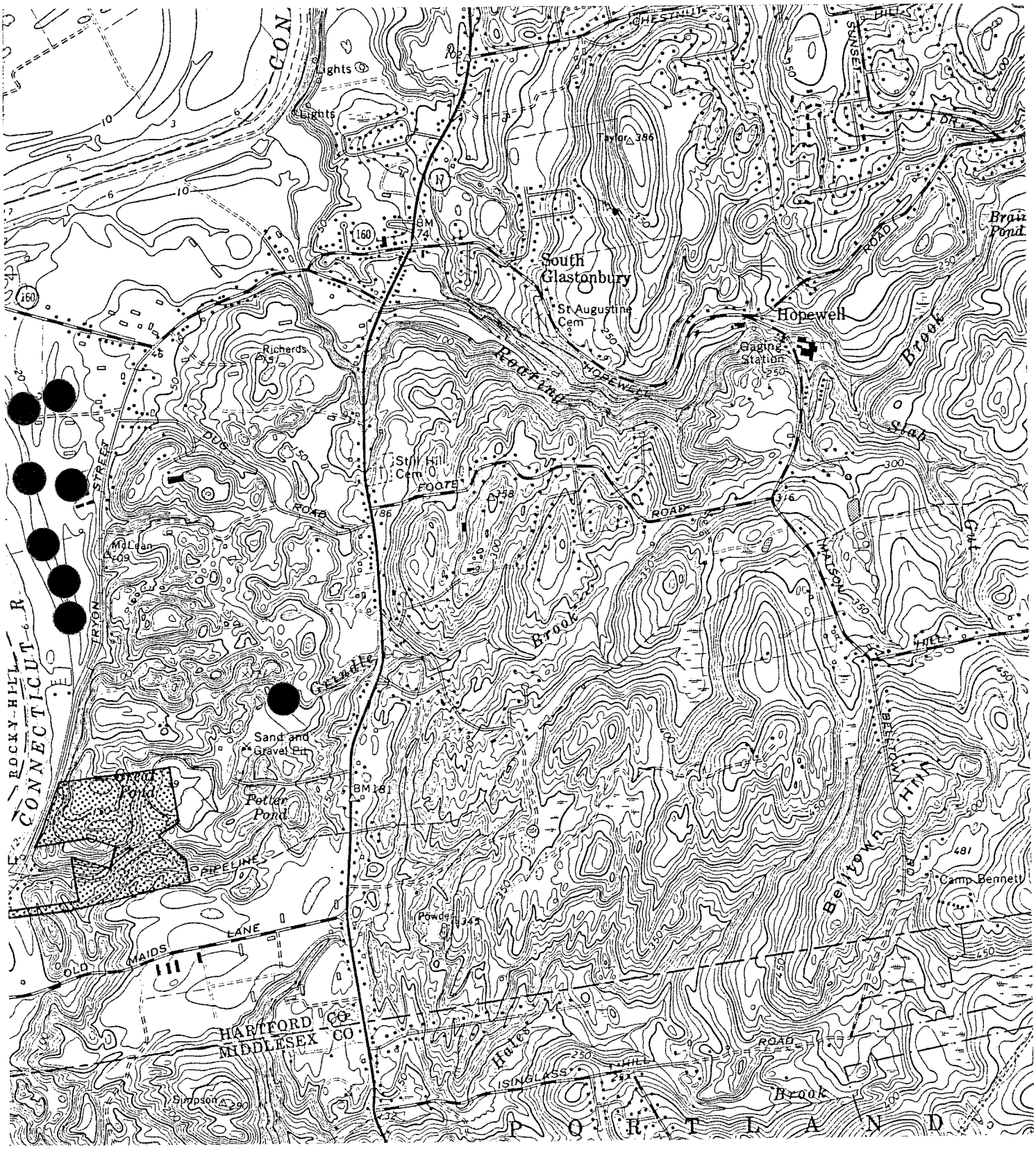
The proposed sand and gravel mining operation would have an adverse effect on any cultural resources in the project area. The above-mentioned prehistoric archaeological sites are relatively shallow in depth (i.e., surface to four feet) and any subsurface mining activity would impact these cultural resources.

A professional archaeological reconnaissance survey is **strongly** recommended in order to locate and identify all prehistoric and historic resources which might exist in the project area. Especially sensitive are the areas along Grindle Brook, Great Pond, and elevated points on the Connecticut River. 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 project area is located in a critical area of importance to prehistoric Native American lifeways. This is demonstrated by the number of archaeological sites in the general vicinity. It is strongly recommended that all feasible efforts be undertaken to identify and ensure the preservation and conservation of the cultural resources in the area.

KNOWN PREHISTORIC SITES MAP

Scale 1" =2000'



ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a varety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialsits, 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.