BULL HILL TREE FARM PONDS

Marlborough, Connecticut

May 1990

Eastern Connecticut Environmental Review Team Report

Eastern Connecticut Resource Conservation and Development Area, Inc.

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Review Date: April 26, 1990
Report Date: May 1990

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Eastern Connecticut Environmental Review Team
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ENVIRONMENTAL REVIEW TEAM REPORT
ON

Bull Hill Tree Farm Ponds
Marlborough, Connecticut

This report is an outgrowth of a request from Marlborough Conservation Commission 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, April 26, 1990. Team members participating on this review included:

Denise Conkling	**District Manager** **Hartford County Soil and Water Conservation District**
Doug Cooper	**Principal Environmental Analyst** **DEP - Inland Water Resources Division**
Kip Kolesinkas	**Soil Resource Specialist** **USDA - Soil Conservation Service**
Elaine Sych	**ERT Coordinator** **Eastern Connecticut RC&D Area, Inc.**
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, and a soils map. During the field review the Team members were given a topographic map and a full set of plans. The Team met with, and were accompanied by the Marlborough Planning Coordinator and Wetland Enforcement Officer, the property owner and his engineer. 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 these proposed irrigation ponds.

If you require additional information, please contact:

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1. Setting, Land-Use and Topography

The Somers Property, about 99 acres in size, straddles the Marlborough-Colchester town line. The town line bisects the southern limits of the site in an east-west direction. The site is bounded on the west by a private airplane landing strip, on the north and east by private wooded land and Bull Hill Road on the south. A ±2 acre man-made pond, located on the Lesnewsky property to the south, abuts a southern corner of the Somers property.

The site and vicinity consists of a private airport that includes related buildings and low density residential properties. The plan distributed to Team members indicates that the western portions of the site, which includes the existing Christmas tree farm is zoned designed commercial and the remainder of the site residential.

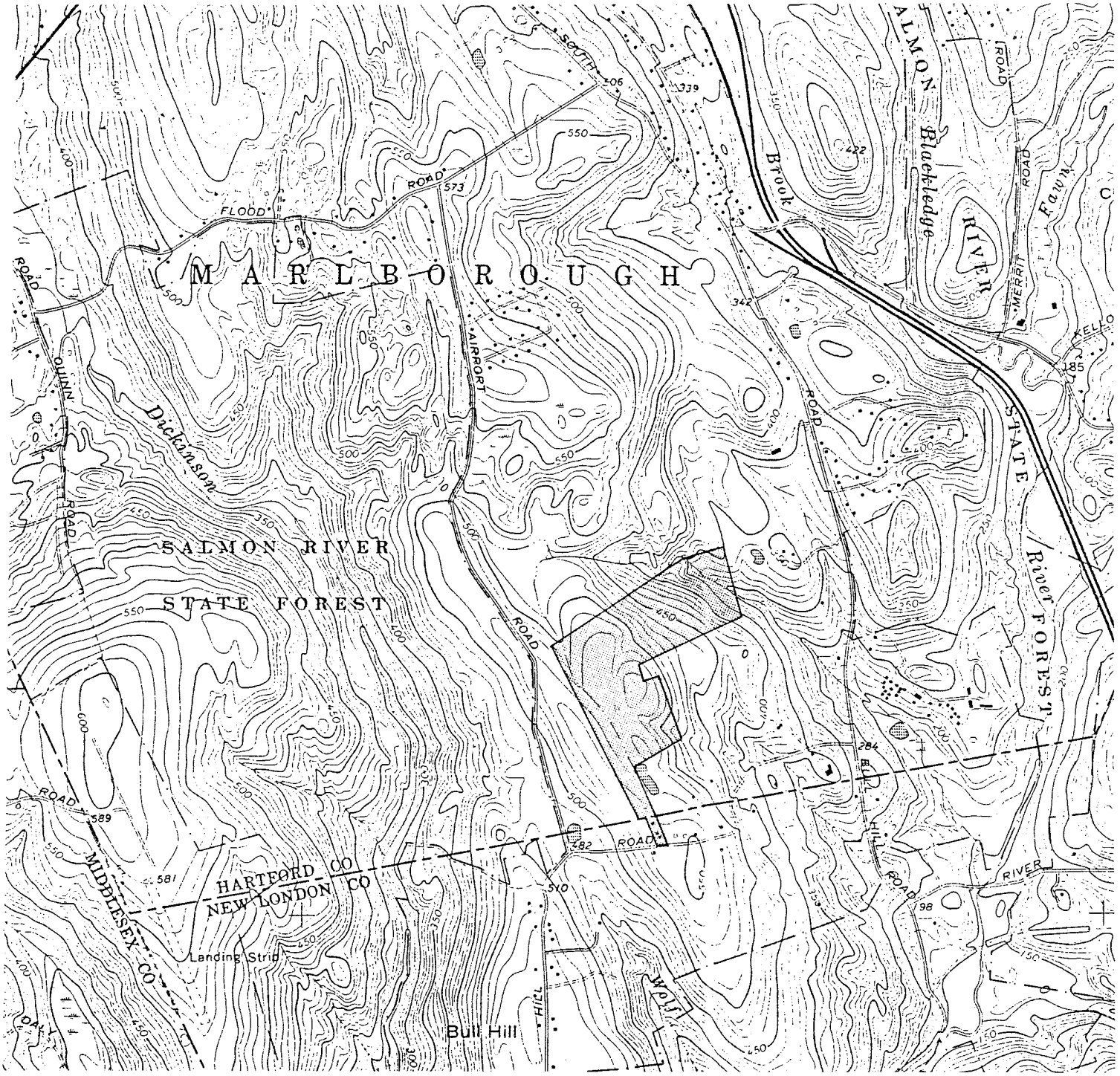
Based on the topography map, the site is located east of a streamlined hill (drumlin) which is covered in part by an airfield. Dominant land features on the site include a north flowing streamcourse and its accompanying wetlands which are located in the western parts and which have been extensively disturbed by excavation and grading prior to the ERT field walk, a gently rolling upland area in the central parts, which contains open fields and wooded land, and a steeply sloping, wooded area in the eastern parts. Bedrock is at or near ground surface throughout the eastern parts.

Maximum and minimum elevations are about 530 feet and 300 feet above mean sea level, respectively.

LOCATION MAP

Scale 1" = 2000'

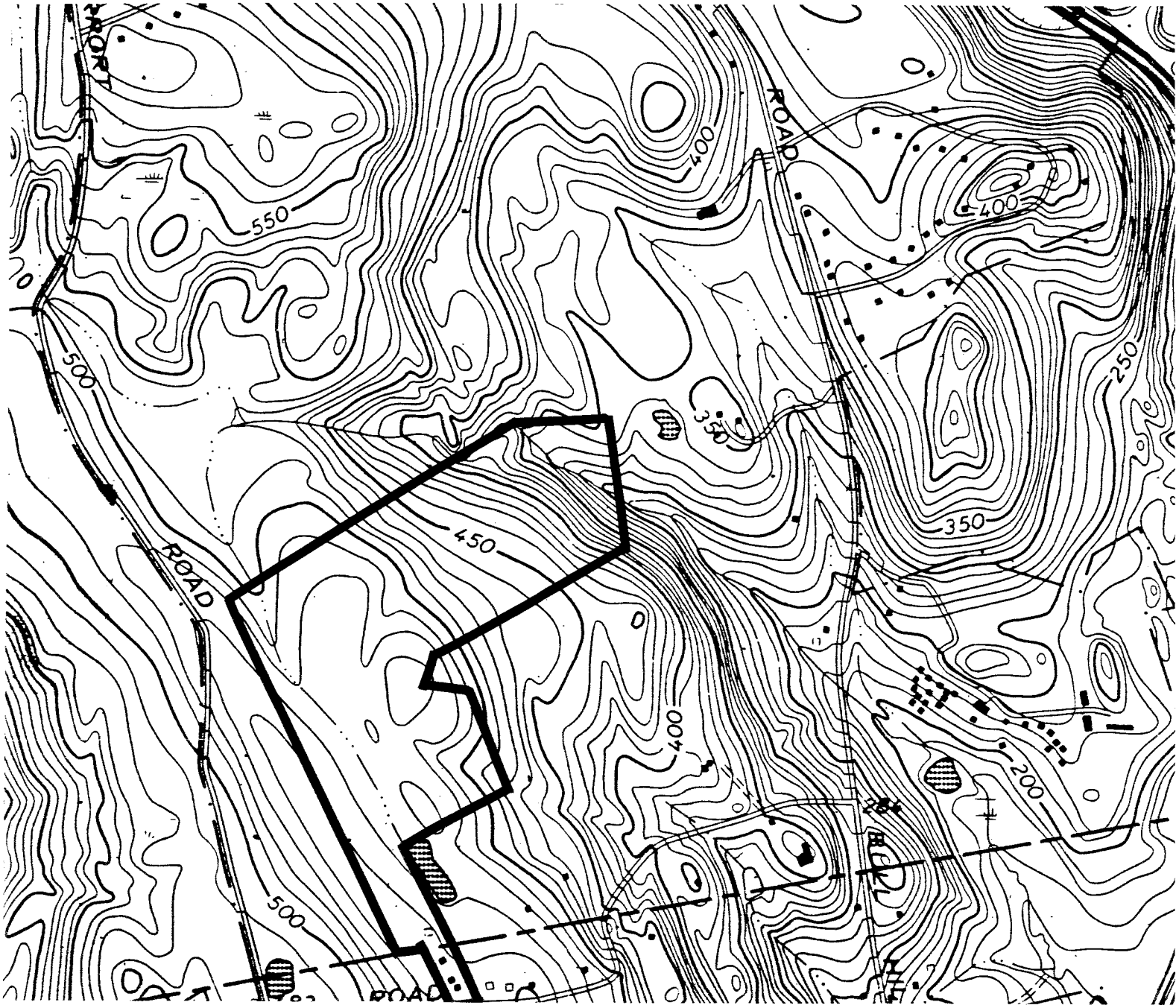
Approximate Site



TOPOGRAPHIC MAP

Scale 1" = 1000'

Approximate Site Boundary



2. Project Description

As indicated earlier, the drainageway and its accompanying wetlands located in the western parts of the site have been extensively disturbed by excavation and grading. Based on information supplied to Team members, this work was conducted during the summer of 1989. The disturbed area includes a trench that was excavated in the drainageway which measures about 100 feet wide, 130 feet long and 5 feet deep. As a result of the work, the land surface that parallels the trench has been extensively disturbed and retains features resulting from excavation. These include stockpiled soils and boulders, poorly drained depressions, and bare (unprotected) soils. All of this activity has disrupted the natural drainage in the area.

Including the graded land east and west of the trench, it is estimated that 3 to 4 acres of the site has been disturbed by the work. Team members were informed on the review day that the end result of the earthwork (excavation) was to be the creation of two irrigation ponds for the applicant's Christmas tree farm and nursery stock. "North Pond" is proposed to be 1.13 acres in size and "South Pond" 1.75 acres in size. The ponds would be created by excavation of the earth materials below the groundwater table in the drainageway. They would be connected by a 16" ductile iron pipe.

This report focuses mainly on mitigative measures and recommendations that the town may wish to consider regarding the restoration of the existing trench and disturbed areas by the property owner. Restoration of the disturbed area should proceed in an environmentally sound manner which protects on and off-site water resources which are hydraulically connected to the drainageway.

3. Geology

The site is located entirely in the Moodus topographic quadrangle. A bedrock geologic map (QR-27, by L.W. Lundgren) and a surficial geologic map (GQ-1205, by D.W. O'Leary) for the quadrangle have been published by the U.S. Geological Survey and the Connecticut Geological and Natural History Survey, respectively.

Depths to the bedrock surface is variable throughout the site ranging from at or near the ground surface in the eastern parts and may be as much as 50 feet below ground at the western property line. Depth to the bedrock surface is probably ten feet or less throughout the central parts of the site. It did not appear that the bedrock surface was encountered in the excavated trench in the western parts.

Except for the northeast corner, bedrock underlying the site is identified as Brimfield Schist. In general, the rock is described as a gray, rusty-weathering medium to coarse grained schist and gneiss. The northeast corner of the site (mainly the steeply sloping areas) is underlain by the Hebron Formation, an

interlayered dark gray schist and greenish-gray, fine to medium grained calc-silicate gneiss.

The term "gneiss" used above describes a crystalline metamorphic (geologically altered) rock that is banded or streaked. A "schist" is a structurally layered crystalline rock. Often layers of schist and layers of gneiss may be found in a single rock outcrop. The rock outcrops on the site are largely made up of the Hebron Formation.

The bedrock structure has influenced the shape of the landforms and the drainage patterns on the site and vicinity. It should be noted that water withdrawn from bedrock wells that tap the Brimfield Schist have a tendency to produce undesirably high concentrations of iron, manganese, or sulfide. Although not a prolific aquifer the local bedrock is generally capable of supplying 3-5 gallons of water per minute to drilled wells. This is equivalent to 4,320 and 7,200 gallons of water per day, respectively.

The unconsolidated materials overlying bedrock on the site are till. Till is a glacial sediment that was deposited directly from an ice sheet. Because the ice, as it moved forward through the region, indiscriminately collected and transported rock particles and fragments of widely ranging sizes, the till is a non-sorted mixture of clay, silt, sandy, gravel and boulders. The texture of the till is also variable, ranging from sandy and loose to silty and tightly compact. Soils mapping data and visual observations noted during the field walk indicates that the till east of the disturbed drainageway is more likely to be sandy (coarse grained), stony, and loose. In contrast, the till in the vicinity of the drainageway and to the west is silty and compact. The till in this area becomes compact at a relatively shallow depth (generally 1.5 to 2 feet below ground surface). This compact soil zone is often referred to as "hardpan". Because of the "hardpan", the till tends to restrict the movement of water from the surface into and through the ground resulting in a seasonally high water table condition. During the field walk, ground water seeps were observed on the west side of the drainageway. This water flows off of the streamlined hill to the west. Additionally ground water seepage was observed to be "bleeding" out on top of the "hardpan" layer exposed in the excavated trench. It is considered likely that the seasonal high water level is a perched water table, resulting from the relatively low permeability of the "hardpan" layer and that the true water table is at or below the rock-till contact.

In light of the preceding discussion and information supplied by the applicant's technical staff, it is reasonable to assume that the water table in the vicinity of the excavated trench/pond site(s) may fluctuate significantly from season to season. Under normal conditions, the water table would be expected to be at its highest from early winter to late spring and lowest from the summer months to early fall. The concern here is that during the summer and fall, when irrigation demands are likely to be highest, the water level in the pond(s) may be so low or may drop to a point where the water requirements for irrigation purposes are greater than the volume of water stored in the pond(s). For this reason and others, which will be discussed later, the Team's geologist

has reservations regarding the feasibility of the area for irrigation pond(s). It is recommended that groundwater monitoring of the local water table in the proposed irrigation pond area be conducted during the forthcoming summer. The water levels in the Lesnewsky Pond should also be monitored during this period.

Another potential limitation of the "hardpan" soils is that the seasonally high water table condition may be too wet during parts of the year for certain varieties of Christmas trees and nursery stock. The Gloucester and Brookfield (GvC) soils (based on the site plan distributed to Team members) that comprise the open fields east of the proposed pond site may be better suited for the Christmas tree farm and nursery stock than the area west of the drainageway.

According to the site plan made available to Team members, regulated soils comprising Leicester, Whitman and Ridgebury very stony sand loam soils (LdA) developed over the till sediments that parallel the drainageway in the western parts. As mentioned earlier, these soils were extensively disturbed by the trench excavation and accompanying land grading. In general, this undifferentiated group (LdA) consists of poorly drained and very poorly drained soils that are commonly found in drainageways and depressions on glaciated uplands. Slopes are nearly level to gently sloping from 0 to 5 percent. Soil texture and mottling indicates a seasonally high water table at an average depth of approximately 6 inches in the Ridgebury and Leicester soils, and at or near the surface in the Whitman soils. Permeability in the Ridgebury and Whitman soils is moderate to moderately rapid in the surface layer and subsoil, and slow to very slow in the substratum. Permeability in the Leicester soil is moderate to moderately rapid. Runoff in these soils is slow to very slow or ponded. Pertinent engineering concerns for LdA soils focus on a seasonally high water table and a slowly permeable substratum at a depth of approximately 16-20 inches in the Ridgebury and Whitman soils.

Map GQ-1205 indicates the drainageway, before the disturbance, was covered by surficial materials that includes mixed sand, gravel, clay, silt variable organic material, and/or blocks and boulders.

BEDROCK GEOLOGIC MAP

Scale 1" = 1000'

Hebron Formation
Brimfield Schist

SURFICIAL GEOLOGIC MAP

Scale 1" = 1000'

Till

Areas of thin till

Local surface material that includes mixed sand, gravel, clay, silt, variable organic matter and/or blocks and boulders.

4. Soil Resources

The landscapes of the site are dominated by a dense till landform on the western side of the parcel (the runway is on a drumloidal hill) and a loose till landform (pasture and hayland area) on the eastern side of the parcel. The soils on the dense till ("hardpan soils") landform are nearly level to sloping, well drained to poorly drained, loamy soils. The soils on the loose till landform are nearly level to sloping, well drained to poorly drained, loamy soils. The portion of the parcel presently disturbed for the pond excavation is between these two landforms and thus the soils are transitional with characteristics of both. This presents challenges and opportunities.

The soil map has been created from on-site investigation during the field review and air photo interpretation. Only the areas of concern to this proposal have been modified from the Hartford County Soil Survey, 1962 to more accurately reflect site conditions and current concepts. The general suitability and limitations of these map units for the proposed uses will be discussed in the text of this section of the report.

The disturbed areas and proposed pond sites are in a concave area between two landforms. The "trench" area probably consisted of dominantly poorly drained soils, with small areas of very poorly drained soils and a small watercourse. A combination of subsurface soil water seepage and surface runoff from surrounding higher areas created the hydrology for this wetland system. The surface and subsurface watershed of this area is small for the size of the proposed ponds, and would supply limited recharge for ponds when lowered by irrigation pumping. The soils in the vicinity of the proposed pond are variable, with some areas having firm dense lower layers that will help hold water (RdA, WpA), and other areas with loose lower layers that may permit seepage from the pond during periods of low water tables (LeA, WpA).

The surrounding upland soils both east and west of the pond have various potentials for the production of field grown Christmas trees and nursery stock, as well as locating a container grown operation. The area proposed for expansion to the west of the pond consists dominantly of moderately well drained (WzB) and somewhat poorly drained and poorly drained soils (RdA). These soils typically do not require irrigation for field grown stock and in general may require subsurface drainage for maximum yields. The slope is typically greater than 3 percent which is less desirable for irrigated trees or container grown stock since it can lead to excess runoff and erosion. In addition, it appears that there may be a narrow additional area of poorly drained soils in the wooded section that does not appear to have been mapped by Mr. Ianni. This needs to be considered before the area is cleared.

The upland areas to the east of the proposed ponds in the open fields are dominated by well drained to moderately well drained loamy soils (CaA, CaB, CaC, SwA) with a much higher agricultural potential. These soils generally have good moisture holding capacity for field grown stock, and the area that is nearly level (0-3% slope) would be suited to the layout of hoophouses for container

grown stock. For more detailed information on the location of the most suitable soils, the landowner may wish to have the property mapped by a consulting soil scientist.

More information should be gathered and thought given as to the kind and size of agricultural operation desired. Water requirements for container grown versus field grown stock are quite different. Since the site offers a limited pond size with limited recharge in the summer when irrigation will be most needed, the potential for irrigated crops is limited and size expectations should be modest.

Part of the charge of the ERT Team is to establish if wetland restoration is feasible. Because it does not appear that this was a particularly complex wetland system before it was disturbed, it should lend itself to restoration, if that is what is desired or requested. The following should be considered in any site restoration plans:

1) Perform all work in the dry time of the year (late July and August),
2) Construct a sediment basin at the northern end of the trench,
3) Backfill with fill from adjacent wetland areas first,
4) Heavily compact backfill in lifts except for last two feet,
5) Use existing stockpiled subsoil and topsoil,
6) Grade to achieve a concave shape,
7) Calculate flows to see if any section will need a protected channel, and
8) Seed with appropriate species and mulch.

The following are comments and considerations for the pond-nursery crops proposal:

1) Consider using the middle to southern portions of the disturbed area for the proposed pond. This portion is more suitable due to flatter gradient (less of an embankment needed) and soils that are less susceptible to seepage (closer to dense till).

2) Investigate the potential for returning outflows from the pond to the south (Lesnewsky Pond) back into the original watershed. This additional water will increase the watershed area needed for recharge and maintaining a downstream baseflow.

3) Consider the use of a drilled well to supplement the pond water under heavy irrigation schedules.

4) Utilize the most suitable soils on the site, those in the field to the east of the proposed pond.

5) Design and install a tailwater recovery system to return runoff irrigation water to the pond.

6 Consider additional comments per the SCS report dated 12-27-89.

December 27, 1989

TO: Denise Conkling, District Manager
Hartford County Soil and Water Conservation District

FROM: J. Eric Scherer, District Conservationist
USDA-Soil Conservation Service

FOR: Peter Gillespie, Planning Coordinator
Town of Marlborough

RE: POND DESIGN EVALUATIONS FOR "BULL HILL TREE FARM"

On December 27, 1989 a site plan review was made of the above proposal. Sheets reviewed included 2 of 8 (dated 9/89); 3, 5 through 8 of 8 (dated 10/89); 4 of 8 (dated 9/89 and 10/89). Also reviewed was a report dated 10/89 by Pare Engineering Corporation. The following comments relative to the proposed pond are offered for consideration:

➨Typically tree farms as the one proposed are not irrigated, but there are exceptions. Generally it is an economic consideration to irrigate based upon the value of the crop. To ensure properly sized irrigation reservoirs, it is necessary to evaluate both crop needs and on-site physical conditions. Data presented in the report by Pare Engineering gives a comprehensive evaluation of the hydrology of the site and the site's water budget that would be available for use. Nevertheless, there is a lack of discussion on the predicted water needs of the tree stock. This is a crucial element in the design of an irrigation reservoir.

➨The report does address the need to "seal" the pond against excessive seepage due to existing soil types. This is wise, but it will inhibit recharge of the pond by groundwater. The pond's recharge will be primarily through surface recharge. This may be a limiting factor since recharge for irrigation will be needed during those low flow periods.

➨The water budget analysis looks at the total year's budget. For irrigation purposes, only those 2 to 3 months of critical times where plants are stressed by lack of water should be evaluated. The last several years have been extremes in rainfall patterns and should not be used as typical years.

➨Once figures for water needs are presented, alternatives to ponds should be investigated. Another source of water to be considered is groundwater through a well. By use of drip

irrigation, an efficient, low energy input irrigation system can be developed.

➨If the concept of the pond is approved by the town, it should be submitted to the Connecticut Department of Environmental Protection - Dams Safety Unit for review and possible permit requirements. Design considerations that should be included in plans are: deep pit testing and logging of pits to determine suitability of site and material for construction; core trenches or other safety devices to prevent leakage; and anti-seep collars.

➨It is not apparent from the design of the structures how low flow or base flow of the brook will be maintained, especially during irrigation. This is a typical problem of in-channel ponds.

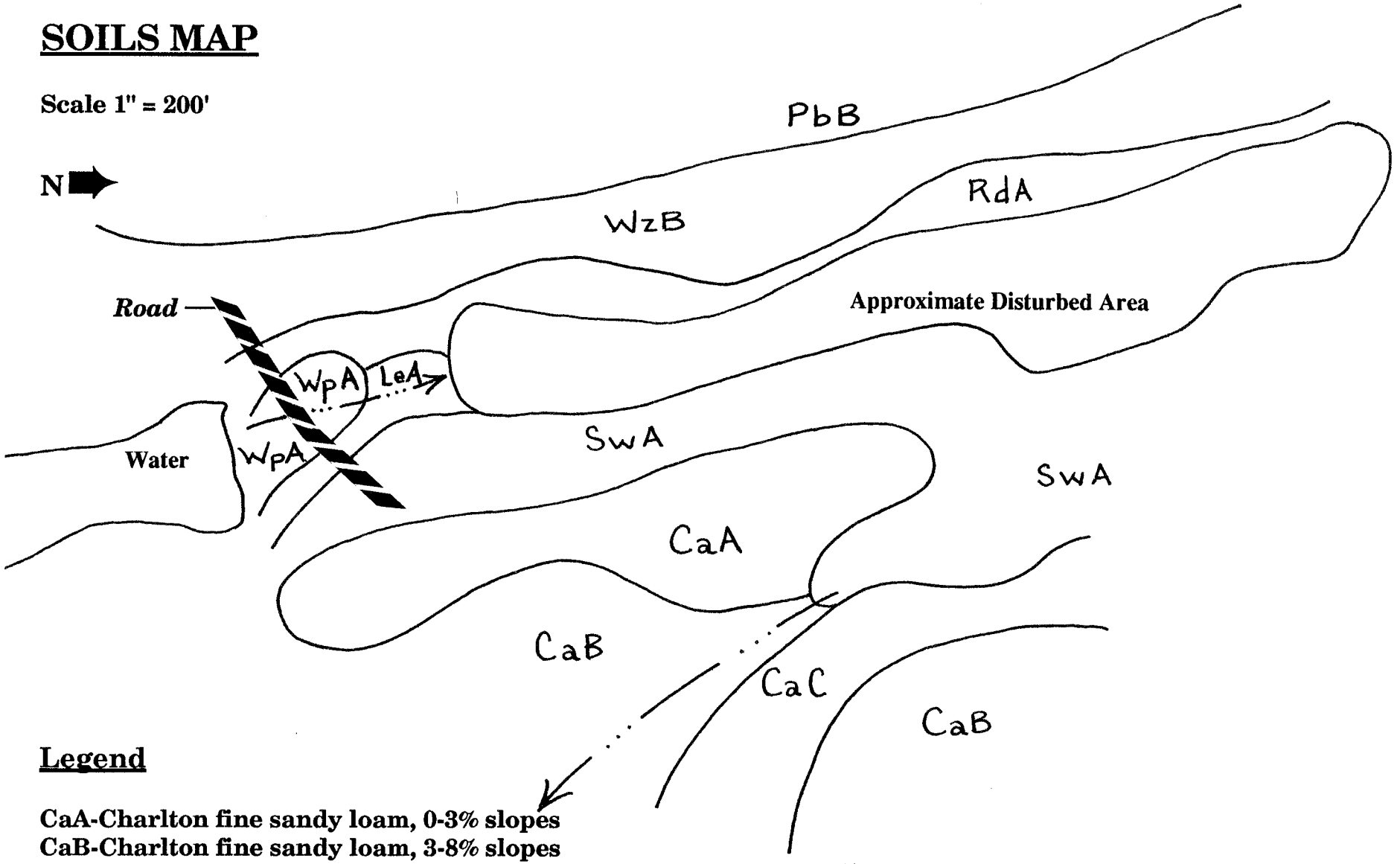
➨The hydrant design does not appear to take into consideration hydraulic restrictions that may affect intake volumes for irrigation.

➨Plans do not address tail water recovery at this site as a result of irrigation. This is crucial on steep erodible slopes.

CC: CT. DEP-Dams Safety Unit, 122 Washington St, Hartford 06106

SOILS MAP

Scale 1" = 200'



Legend

CaA-Charlton fine sandy loam, 0-3% slopes
CaB-Charlton fine sandy loam, 3-8% slopes
CaC-Charlton fine sandy loam, 8-15% slopes
LeA-Leicester stony loam, 0-3% slopes
PbB-Paxton loam, 3-8% slopes
RdA-Ridgebury loam, 0-3% slopes
SwA-Sutton stony loam, 0-3% slopes
WzB-Woodbridge stony loam, 3-8% slopes
WpA-Whitman stony loam, 0-3% slopes

5. Hydrology

According to the accompanying topographic map, the principal streamcourses on the site occur in the western limits where the disturbance has occurred and in the northeast corner. Both are hydraulically connected. The segment of the streamcourse in the western parts flows in a northerly direction and is intermittent; hence, a stream which flows but part of the time, as after a rainstorm, during wet weather, or during part of the year. After leaving the site, it merges with another intermittent streamcourse about 1,500 feet north of the property to become a permanent streamcourse. From their point of confluence, the streamcourse flows generally in an easterly direction and eventually flows through the northeast corner of the Somers property for a distance of about 1,000 feet. It ultimately flows into Blackledge River.

A review of historical topographic maps of the site and vicinity that date back to 1951 indicate that the outlet stream for the man-made pond on Lesnewsky Property to the south originally discharged to the drainageway in the western limits of the Somers Property. However, Team members were informed on the review day that the outlet stream for the Lesnewsky Pond no longer flows northward to the Somers' Property but instead has been diverted eastward via a topographic swale which routes the water to an unnamed intermittent streamcourse that is about 2,000 feet east of the pond's outlet. The work was done in the late 1970's. The outlet for the Lesnewsky Pond is tributary to the streamcourse that flows through the northeast corner of the Somers Property.

At its intersection with the northern property line, the intermittent streamcourse in the western parts of the Somers Property originally drained an area estimated to be about 47 acres. However, since the outlet for the Lesnewsky Pond has been diverted eastward, the drainage area to the design point mentioned in the preceding sentence is reduced to about 33 acres.

The surface waterbodies located within the Somers property and its vicinity are classified as Class "A" water resources by the Department of Environmental Protection. A Class "A" surface waterbody means that it is uncontaminated and designated for use as a potential public water supply. Other designated uses include fish and wildlife habitat and recreational.

Because of the site's hydrogeologic setting and soil types, it is expected that direct surface runoff will be a major source of water to a pond or ponds excavated in the area of the existing trench on the Somers Property. As such, the size of the proposed pond or ponds is related to the contributing drainage area.

The amount of runoff that can be expected annually from a given watershed depends upon many interrelated factors such as topography, soil infiltration, vegetative cover, and surface storage. In addition, storm characteristics such as amount, intensity and duration of rainfall affects water yields. It is possible to estimate the approximate size of the drainage area (in acres) needed for a desired water-storage capacity utilizing a method described

in a U.S. Department of Agriculture Soil Conservation Service publication entitled Ponds - Planning Design, Construction (June 1982). Using the method outlined in the publication, one can estimate the approximate size of the drainage area (in acres) required for each acre-foot of storage in an excavated pond. For example, it is estimated that a pond 20 acre-feet in size and located in east central Connecticut would require a drainage area of about 35 acres; a pond 10 acre-feet in size would require a drainage area of 17.5 acres, and a pond 5 acre-feet in size would require a drainage area of 8.75 acres.

Present plans indicate that two ponds, referred to as "North" and "South" would be excavated in tandem in the drainageway and comprise ±20 acre-feet. Using the method described in the preceding paragraph a drainage area of at least 35 acres would be needed to supply the pond(s). Locating "North Pond" in the northcentral parts of the drainageway, it is estimated that the drainage area of the ponds would be about 23 acres. This drainage area does not include the drainage area that feeds the Lesnewsky Pond, which is calculated to be about 14 acres. As one can see, there is a shortfall of about 12 acres that would be required for a drainage area feeding a 20 acre foot pond using the SCS guideline. This shortfall could be addressed by **(1)** downscaling the size of the pond(s) or **(2)** by re-routing the outlet stream for the Lesnewsky Pond back to its original course. The latter would increase the drainage area to ±37 acres.

The size of the pond(s) should be based on the water requirements for irrigation of the Christmas trees and nursery stock. This information was not made available to Team members or Commission members.

The required storage capacity of a pond(s) used for irrigation will depend on such factors as: water requirements of the Christmas tree and nursery stock to be irrigated, effective rainfall expected during the growing season, application efficiency of the irrigation method, losses due to evaporation and the expected inflow to the pond. All of this information is very important and should be made available to Commission members and town officials by the applicant. The pond capacity must be adequate to meet the requirements of the operation. Because of the fluctuating water table condition that is likely to occur in the area of proposed pond sites and limited drainage area, there is a concern that the water level in the pond(s) may be too low or insufficient to meet the irrigation needs for the Christmas tree farm and nursery stock requirements during the summer months.

It may be possible to augment flows to the pond or ponds by utilizing water withdrawn from a bedrock well or wells. As mentioned earlier, the seasonal high water table in the vicinity of the desired pond(s) is a perched water table that results from the relatively low permeability of the "hardpan" layer, and that the true water table in the bedrock is below the bedrock-till contact. Yields from the underlying metamorphic bedrock would not be expected to be high, but probably ranges from 3-5 gallons per minute or 4,320 gallons per day to 7,200 gallons per day, respectively. The natural quality of the water withdrawn from the bedrock would be expected to be good except that it may be tainted with elevated levels of iron, manganese or sulfides, especially the Brimfield Schist.

As such, it may need to be filtered and treated before it is used to supplement water flows to the pond(s) or serving irrigation needs for the Christmas tree farm and nursery stock. Water quality could adversely impact the environmental health and aquatic habitat of the pond(s) and downstream watercourses.

Reclamation of the excavated and graded area in the western parts of the Somers property will inevitably disturb and mobilize the finer soil particles, particularly due to the presence of till soils that are likely to contain fine sand, silt and clay particles. Containment and filtration of the disturbed water is necessary to avoid environmental damage and complaints from downstream neighbors. In order to minimize the impacts to downstream areas and hydrogeologic impacts during the restoration period every effort should be made to conduct the work during the summer months when streamflows are likely to be at their lowest. Additionally, prior to any restoration work a sediment pond should be constructed in the northern parts of the drainageway. The concern here is that hay bales, silt fences, and/or permanent and temporary vegetation may be inadequate especially during heavy precipitation, e.g., thunderstorms.

Locating a pond in the northcentral parts of the drainageway will leave room for the construction for the sediment basin while maximizing the drainage area to an irrigation pond or ponds. Also the nursery area and tree farm are proposed close to this area which will help reduce the distance of conveying the water.

In the area between the sediment basin and the northern property line as well as the areas outside of the irrigation pond(s), the disturbed wetlands should be restored to its original condition. Properly restored wetlands are a favorable environment for the elimination of water quality impacts and will serve to sustain minimum streamflows to downstream areas.

In summary, the proposed irrigation pond or ponds should be designed based on the irrigation needs of the Christmas tree farm and nursery stock operation. This information, which has not been determined is essential since the pond(s) capacity must be adequate to meet operation needs, particularly during the summer months when the need for irrigation will be greatest. Additionally the relatively small drainage area and the presence of till soils, which tend to have fluctuating water tables is expected to limit the size of the proposed irrigation pond(s) on the site. Because of these circumstances, reduction in the size of the proposed pond(s) appears inevitable.

WATERSHED BOUNDARY

Scale 1" = 2000'

Approximate site

Streamcourses showing direction of flow

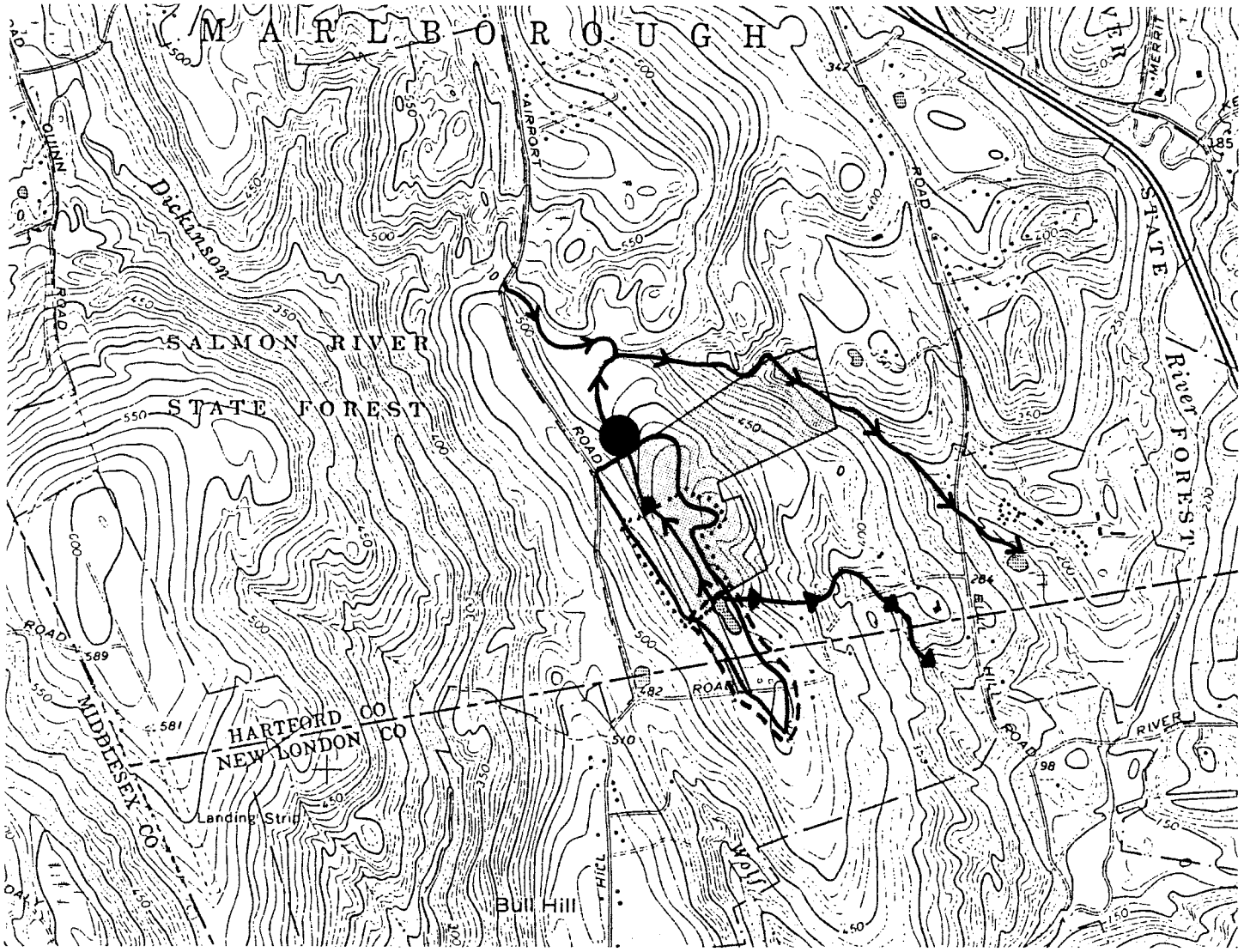
Lesnewsky Pond

Watershed boundary and its respective point of outflow for the unnamed streamcourse at the western limits of the Somers property at its intersection with the northern property line.

Approximate watershed boundary for the Lesnewsky Pond.

Outlet for the Lesnewsky Pond showing direction of flow.

Approximate watershed boundary and respective point of outflow for the proposed ponds.



6. Inland Water Resources Review

Environmental Setting

The area of the study consists of an area roughly four acres in size which has been altered prior to the Team's visit by excavation and grading activities. Prior to disturbance the area would have been classified as a wetland with characteristics typical of a wooded red-maple swamp located in an upland glacial till setting. This wetland, while near the top of the watershed for the area did, apparently, act as a drainageway with an intermittent stream which exits the property to the north. Earthmoving activities have removed all vegetation in the area of study. In certain locations, one to two feet of excavated material have been graded over original soil materials, thereby raising surface elevation somewhat and burying the wetland substrate.

Wetland Functions

Prior to disturbance, this wetland corridor would have provided considerable wildlife/birdlife habitat, pollution filtration/water quality renovation benefits, and groundwater storage. Most of these benefits have been diminished by virtue of the wetland alteration. It may be possible to restore certain of the wetland functions by carefully planned remedial measures.

Existing Proposal

The existing proposal and water budget have been extensively discussed in supporting documentation provided by the applicant. The hydrologic impact of the ponds and future water withdrawals has been discussed by other Team members.

Recommendations

Based upon the location of the proposed pond sites (in the upper reach of the watershed), the potential use of water for irrigation and the existing level of wetland disturbance, certain remedial measures are indicated. Of highest priority would be protection of downstream areas from sediment which would be generated from the existing disturbed areas. In this vein, a sediment cachement basin should be constructed at the northern end of the property. Such a basin should be constructed to standards as adopted by the USDA Soil Conservation Service in the Erosion and Sediment Control Handbook, and maintained throughout the life of the project and until all exposed soils are revegatated

In order to provide continued protection of water quality and quantity downstream from the project site, it is suggested that certain wetland areas on the property be restored. The most desirable locations for such restoration efforts are at the extreme ends of the existing excavation. The northernmost 100 feet and southernmost 100 feet of excavated wetlands could be re-filled and graded to

approximate the pre-existing ground elevation. Low earthen or trap rock dikes could be created to slightly entrain surface flow in order to maintain soil saturation and the area could be seeded and mulched for soil cover until wetland species re-vegetate the area. The restored wetlands will serve to protect water quality and sustain wetlands will serve to protect water quality and sustain minimum stream flows entering the future pond leaving the property to the north. Wherever possible, soil materials for back filling of the excavation and wetland restoration shall be obtained by removing fill overburden from adjacent wetland areas. This will provide native vegetative root propagules and seed stock to assist in wetland restoration.

It is recommended that the pond proposals be scaled down to accommodate the aforementioned wetland restoration and to be more compatible with the contributing drainage area.

In order to avoid diminution of stream flow downstream, the ponds should provide for a minimum discharge as suggested in the report by Pare Engineering. Care should be exercised to keep irrigation withdrawals from depleting the reservoir to a point where normal discharges to downstream areas are interrupted.

Wildlife and birdlife can be encouraged to return to the area by plantings which provide cover and food sources. Suitable plant materials maybe found in the USDA publication "Conservation Plantings for the Northeast."

Careful restoration of disturbed wetlands and proper design of the ponds and sediment control measures can serve to meet the property owners goals while providing a measure of environmental enhancement. If properly implemented, these measures should serve to mitigate the impact of the future pond project as well as the existing altered wetland resource.

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 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.