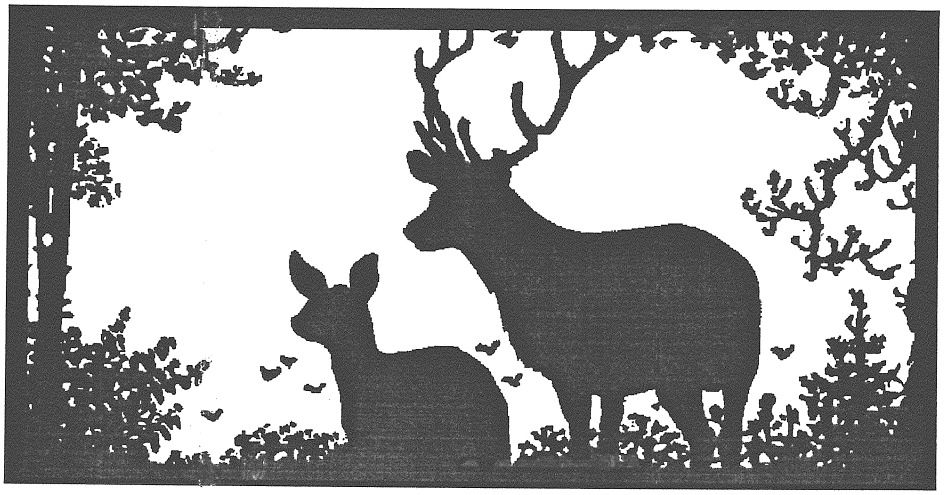
Deer Ridge Subdivision

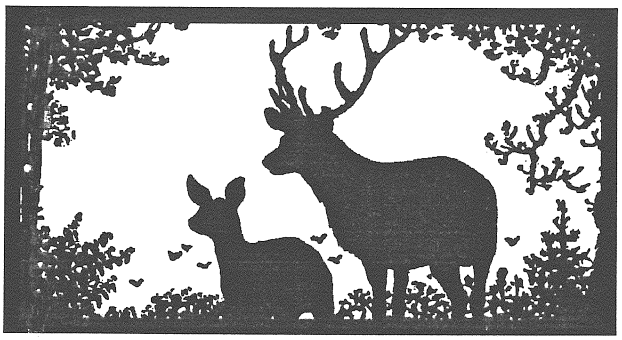
Westbrook, Connecticut



Eastern Connecticut Environmental Review Team Report

Eastern Connecticut Resource Conservation & Development Area, Inc.

Deer Ridge Subdivision
Westbrook, Connecticut



Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team
of the
Eastern Connecticut
Resource Conservation and Development Area, Inc.

for the

Conservation Commission
Westbrook, Connecticut

September 2001

CT Environmental Review Teams
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Acknowledgments

This report is an outgrowth of a request from the Westbrook Conservation Commission with support from the Inland Wetlands Commission and the Planning Commission to the Middlesex County Soil and Water Conservation District (SWCD). The SWCD referred this request to the Eastern Connecticut Resource Conservation and Development Area (RC&D) Executive Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The Eastern Connecticut Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

The field review took place on Wednesday, July 11, 2001.

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I would also like to thank Tom ODell, conservation commission, Beth Jennings, town planner, Heidi Wallace, inland wetlands enforcement officer, Raymond Fontaine and John Clements, inland wetland commission members, Marilyn Ozols and Thomas Elliot, planning commission members, Hubert Kauffman, intervenor, Joseph Russo, applicant, Ken Mullett, J. J. Russo & Son Construction, and Stuart Fairbank, engineer for the applicant, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with location and soils maps. During the field review Team members were given plans and additional reports and information. Some Team members made individual or additional visits to the project site. 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 plans 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 applicant. This report identifies the existing resource base and evaluates its significance to

potential development, and also suggests considerations that should be of concern to 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 reviewing this proposed subdivision.

If you require additional information please contact:

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Introduction

Introduction

The Westbrook Conservation Commission with the support of the Inland Wetlands Commission and Planning Commission have requested assistance from the Eastern Connecticut Environmental Review Team in conducting a review of the proposed Deer Ridge Subdivision.

The ±143 acre site is located on Route 145 (Horse Hill Road) approximately 3/4 of mile north of I-95. The Clinton town line forms the western property boundary. A 22 lot single family residential subdivision is proposed that will have individual on-site water supply wells and sewage disposal systems. One new road is proposed that will end in a cul-de-sac near the Clinton town line. The forested site is characterized by ridges and wetlands. Plane Brook, a perennial stream, runs through the eastern portion of the property from north to south. There is one wetland road crossing proposed and two driveway crossings.

Objectives of the ERT Study

The commissions are requesting the review to assist them is their evaluation of this proposed project. Specific concerns include wetland impacts, stream crossing designs, erosion and sediment control, stormwater management, planning issues, and open space design. The ERT report will provide a natural resource inventory, a discussion of impacts, guidelines and recommendations for the mitigation and protection of the natural resources and also raises some areas of concern where additional information may be required.

The ERT Process

Through the efforts of the conservation, inland wetlands and planning commissions this environmental review and report was prepared for the Town of Westbrook.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the commissions. Team members were able to review maps, plans and supporting documentation provided by the applicant.

The review process consisted of four phases:

1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted on Wednesday, July 11, 2001. Some Team members made individual and/or additional site visits. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.

Figure 1.

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Location and Topographic Map

Scale 1" = 2000'

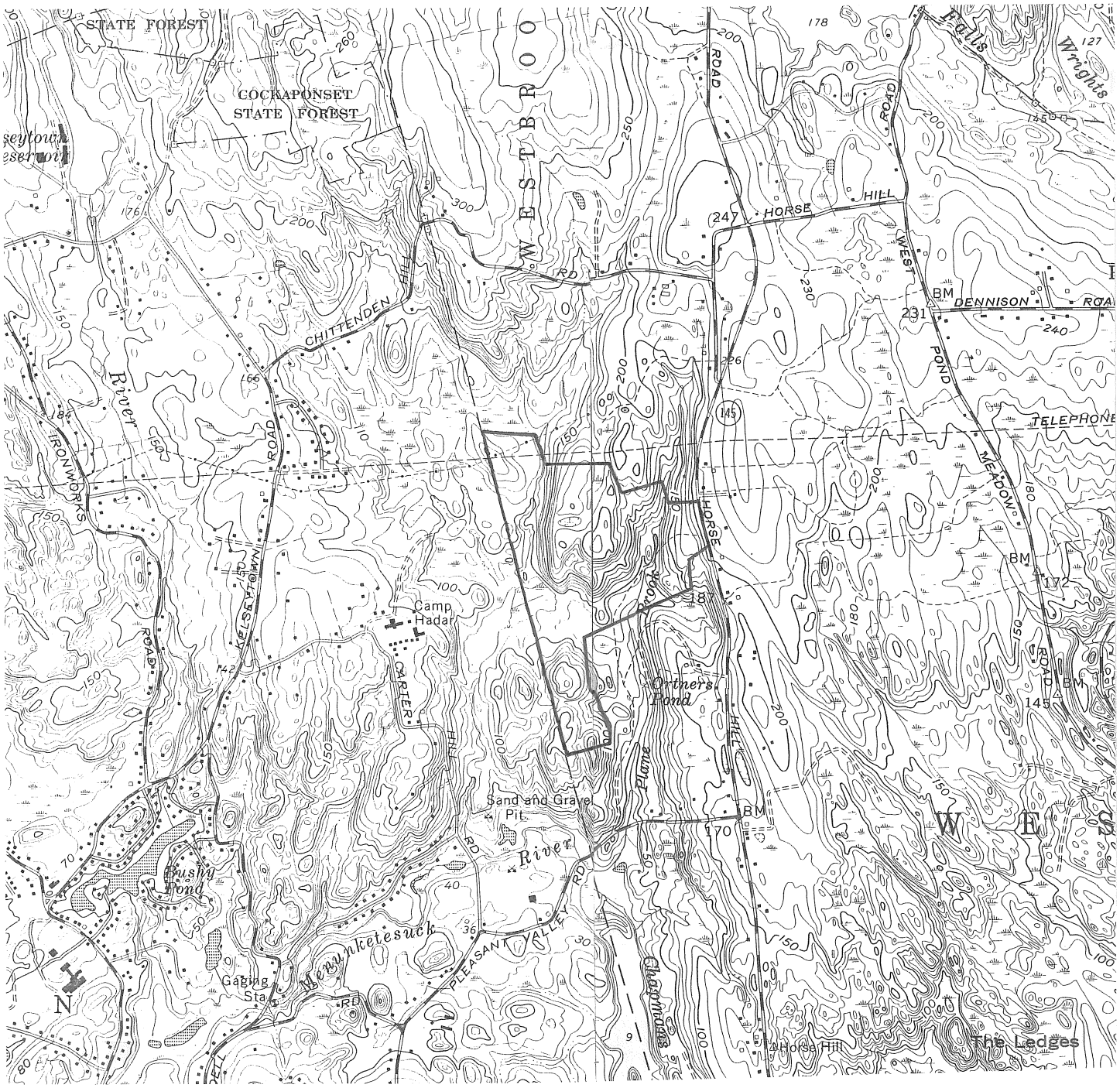

Figure 2.

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Soils Map

Scale 1" = 1320'

Topography, Surficial Geology and Bedrock Geology

Topography

The proposed 145-acre Deer Ridge subdivision straddles a major NNE-SSW trending bedrock ridge. A steep sided 1000-foot wide flat-bottomed WNW-ESE trending valley divides the uplands on the property. The uplands are characterized by rocky ridges, cuesta* -like SW facing bedrock cliffs and steep sided gullies. The topography seems to be controlled by a series of readily eroded NNE-SSW fractured zones (see Air photo, Figure 3) and glacial plucking of large bedrock slabs along a shallow dipping prominent foliation. Plucking of large joint bounded blocks has left closed basins (now vernal pools) at the base of some SW facing upland cliffs.

The entire site lies within the drainage area of the Menunketesuck River. However, the eastern portion of the site drains into Plane Brook that enters the Menunketesuck just north of Chapmans Pond. Runoff from the western half enters the Menunketesuck near Carter Hill Road. (see Figure 4)

Bedrock Geology

The Monson Gneiss, a rather homogeneous, light gray, feldspar-quartz-biotite-hornblende gneiss, interlayered with amphibolite and granite underlies the site. The rock is not conspicuously rusty weathering, which suggests that high levels of dissolved iron will not be a problem in domestic wells. In outcrop vertical NNE joints and fractures parallel to the prominent shallow dipping foliation are common. Bedrock wells should be quite productive. The highest yielding wells will no doubt be sited in the highly fractured NNE ravines delineated in Figure 3.

Surficial Geology

A thin (generally <10 ft.) irregular veneer of glacial till covers much of the uplands on the site (Figure 5). The till cover when deposited by flowing ice 20,000 years ago, may originally have been thicker but was eroded by subglacial meltwaters during the early stages of deglaciation. Indeed, just to the east Horse Hill Road the till blanket is much thicker and has been molded into smooth streamlined ESE trending hills. As a result some of the small upland gullies and depressions may be filled with a sandy, less compact, more permeable till than might normally be expected in upland areas.

The low, flat ground along the ESE valley that cuts the upland ridge is underlain by several 10's of feet of ice contact stratified sands and gravels. This material

was deposited by glacial meltwaters during the final stages of deglaciation roughly 14,000 years ago.

References:

Essex Quadrangle

Flint, Richard, F., 1975. The Surficial Geology of the Essex and Old Lyme Quadrangles. Connecticut Geologic and Natural History Survey, QR-31.

Lundgren, Lawrence, 1964. The Bedrock Geology of the Essex Quadrangle. Connecticut (Geologic and Natural History Survey. QR-15.

Clinton Quadrangle

Flint, Richard, F ., 1971. The Surficial Geology of the Guilford and Clinton Quadrangles. Connecticut Geologic and Natural History Survey, QR-28.

Lundgren, Lawrence and Thurrell, Robert, F., 1973. The Bedrock Geology of the Clinton Quadrangle. Connecticut Geologic and Natural History Survey, QR-29.

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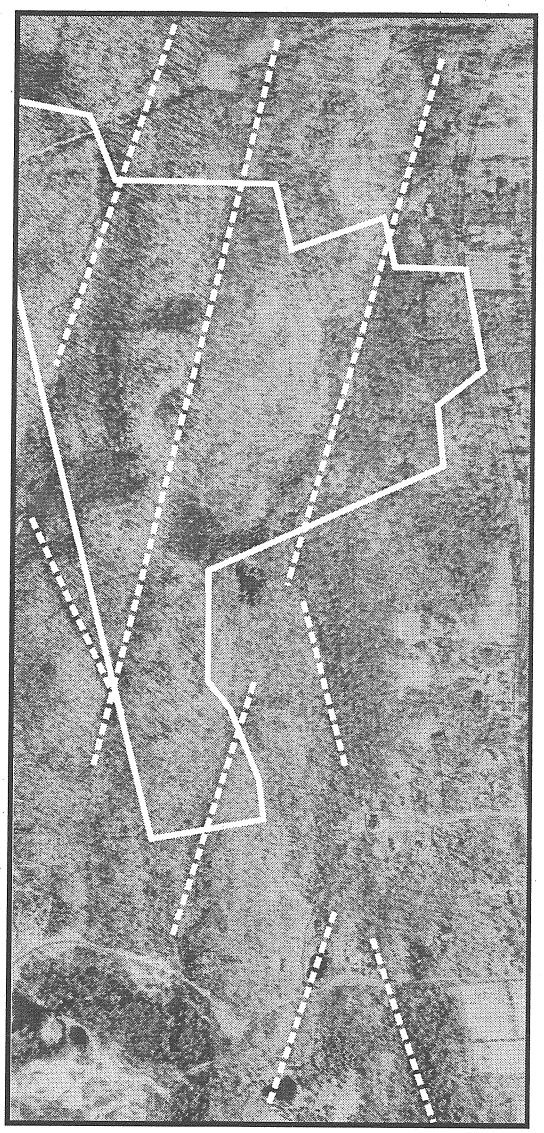
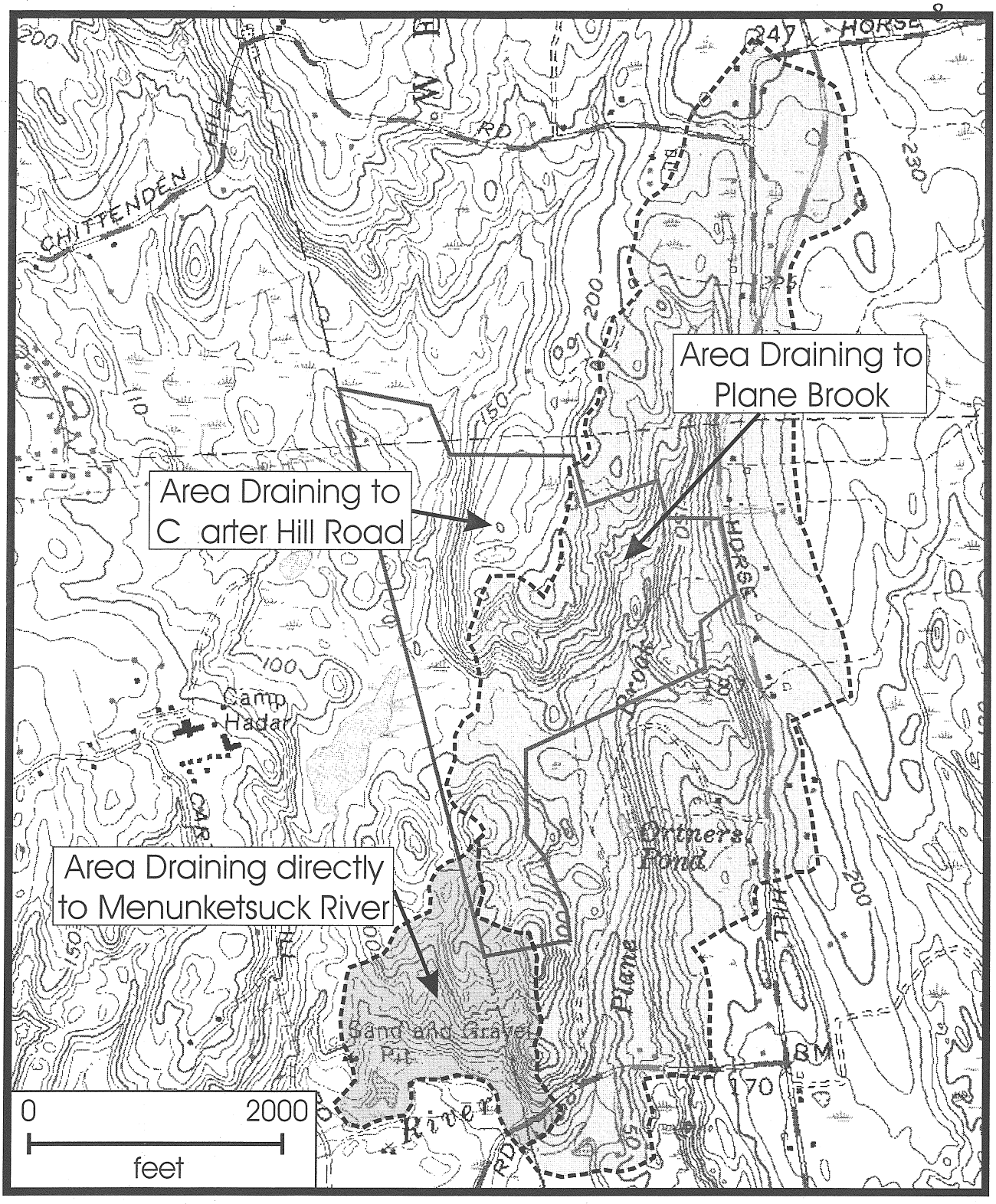
* A land elevation with a gentle slope on one side and a cliff on the other.

Figure 3.



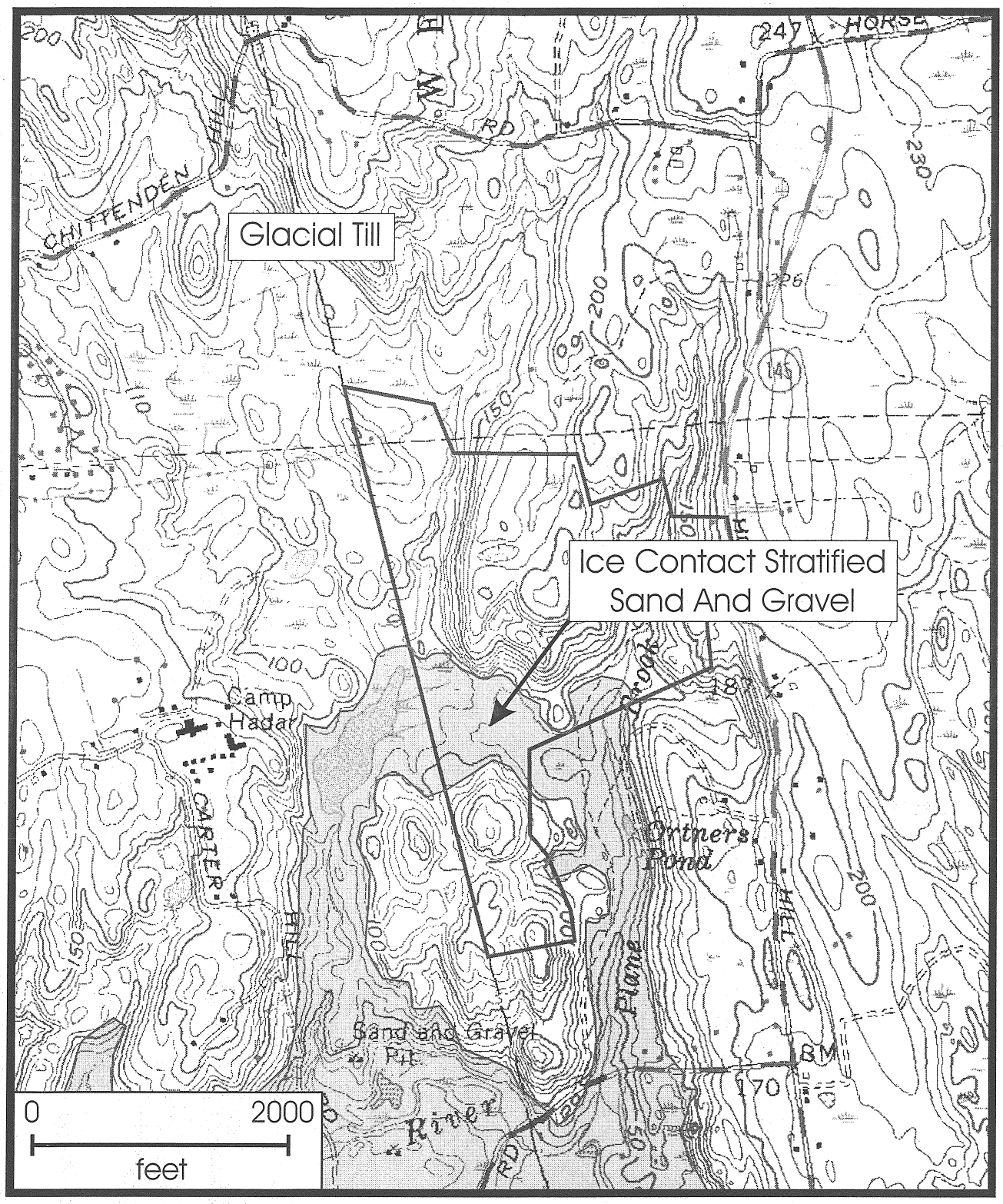
Fracture linements shown as dashed white lines

Air Photo Deer Ridge Subdivision
Westbrook, Connecticut



Destination of Runoff from the Deer Ridgr Subdivision
Westbook, Connecticut

Figure 4.



Surficial Geology - Deer Ridge Subdivision
Westbrook, Connecticut

Figure 5.

Wetland Resources Review

Wetland Inventory Introduction

The Deer Ridge property lies along the west-central Westbrook/Clinton border and encompasses 142.4 acres. Of this amount ±21 acres is mapped as wetland. 42 acres will be deeded as Open Space.

The parcel is divided into two watersheds. About 55% is in the Plane Brook watershed on the east and 45% in the unnamed watershed to the west. This unnamed watershed is dominated by a series of wetlands connected by a series of watercourses which flow north to south through the drainage. Large wetlands and two of the three potential vernal pools on site occur in this unnamed drainage. But these wetlands are for the most part in the deeded open space or substantially buffered from development and thus only cursorily dealt with in this report. It is the wetlands that contribute to the Plane Brook drainage that are impacted by road and driveway crossings and thus the subject of both this report and the review of the town commissions.

The impacted wetlands on the parcel are part of the Plane Brook watershed. This roughly north/south, 1.7 mile long basin is 409.2 acres in size. Deer Ridge subdivision sits in the middle fifth of the watershed. At its headwaters, about 260 feet above sea level, the watershed is nearly flat and home to wetlands. These headwater wetlands give rise to Plane Brook which flows south through the basin and over the site. Seven tenths of a mile south of the site, Plane Brook empties into the Menunketesuck River at elevation 25 feet.

On the site, the brook elevation drops from about 120 feet at the north boundary to about 80 feet at its southern boundary. Five west-to-east cross sections of the watershed yield an average profile of 155 feet of elevation on the hilly west side of the watershed dropping 43 feet to the watercourse at 112 feet and then back upslope to the hillier 220 foot east side hills. Thus, Plane Brook sits on the bottom of a U-shaped valley with wetlands contributing to it from the slopes. It is on this landscape the Deer Ridge subdivision is laid out.

At the time of the ERT visit the 142.2 acre parcel was almost totally wooded. Only a few woods roads pass through. The only open water the Team observed was in the two southern most potential vernal pools; and even those were very nearly shaded with overhanging trees. The balance of the wetlands were forested, often dominated by red maples at the tree layer. The herb layer and the forest floor, especially on the low lying Leicester complex soils, were dominated by skunk cabbage and a variety of wetland ferns. Large organic debris in the form of fallen trees and branches add to the health and function of these forested wetlands.

There are many apparent wetlands on the site. When looking at the single sheet site plan the three potential vernal pools are easy to find mostly because of their

isolated and unimpacted nature. Additionally, the wetland that makes up a portion of lots 14 and 15 is quite large, but only partially on this parcel.

Less apparent in the map lines of the steeper topography is the network of forested wetlands that contribute to the Plane Brook watercourse. These wetlands, for the most part, lie along the low topographic areas and border, or drain downhill into, Plane Brook.

Two types of soil underlie the wetlands on the site. The wetland soil of greatest extent is Lg: the Leicester, Ridgebury, Whitman complex. This soil underlies Plane Brook, the contributing wetlands on lots 3 and 4, and the two northern most potential vernal pools. The second wetland soil type is present on lots 1 and 2 by Route 145 and at the wetland that runs off the property to the west (lots 14 and 15). These are Aa: Adrian muck wetlands. The Leicester complex is formed over glacial till and is classified as poorly drained. The Adrian muck is a deep organic soil over loamy substrate and considered very poorly drained.

All of these Plane Brook wetlands are important as they systematically occur right in the middle of the overall north-south wetland system. As a result of their placement on the landscape, they are functionally providing and maintaining good water quality and quantity to the watercourse further down in the watershed.

Wetland Assessment

Water Quality

The water quality for this 142.2 acre parcel as mapped by The Connecticut Department of Environmental Protection indicates that the surface water quality classification for all of the Plane Brook watershed including the Deer Ridge site, and its unnamed neighboring watershed to the west, is A. Ground water quality for both watersheds including the site is GA. The descriptions of these classifications are:

- Class A

  Designated uses: potential drinking water supply; fish and wildlife habitat; recreational use; agricultural and industrial supply and other legitimate uses including navigation.

  Discharge restricted to: same as allowed in AA (i.e.: Discharge restricted to: discharges from public or private drinking water treatment systems, dredging and dewatering, emergency and clean water discharges.).

- Class GA

  Designated uses: existing private and potential public or private supplies of water suitable for drinking without treatment; base flow for hydraulically connected surface water bodies.

Discharge restricted to: same as for GAA (i.e.: discharges limited to: treated domestic sewage, certain agricultural wastes, certain water treatment wastewaters.) and discharge from septage treatment facilities subject to stringent treatment and discharge requirements, and other wastes of natural origin that easily biodegrade and present no threat to groundwater.

Source: Protection Summary of the Water Quality Standards and Classifications, Connecticut Department of Environmental Protection, Bureau of Water Management.

National Wetland Inventory

The Fish and Wildlife Service National Wetland Inventory (NWI) maps have mapped the area on its Clinton and Essex NWI maps. These maps classify Plane Brook and its contributing wetlands and watercourses as PFO1E . This is (P) Palustrine, the most common type of wetland in Connecticut, Forested (FO), broad leafed deciduous (1), and seasonally saturated (E). Due to the scale of NWI mapping, 1:24,000, only one of the three potential vernal pools was mapped and that has the same classification as above. The wetlands in the unnamed watershed to the west are also classified as PFOIE with the exception being the large wetland that lots 14, 15, and 16 drain into. This is PSSIE, similar to the above class only the Scrub Shrub (SS) replaces the Forested aspect of vegetation growth.

The soils on-site were delineated by Richard Snarski, Professional Soil Scientist.

Potential Wetlands Impacts /Problems/Recommendations

- Route 145 storm water: The entrance road to the subdivision will intercept and redirect stormwater runoff from Horse Hill Road/Route 145. Plans show this stormwater diverted towards the wetland situated on lot 1. This storm drain/storm water system has the great opportunity to carry road sand and clog the plunge pool/rip rapped level spreader. The construction of this storm water system should include a catch basin with a sediment trapping device accompanied by a maintenance schedule for cleanout to avoid future water and sediment overrun into the wetland.

- Soil Erosion and Sedimentation: Potential long term concerns about sedimentation include the maintenance of the two sediment ponds, A and B. The discussion of the effective life before maintenance was never brought up in general discussion, but it should be addressed. With the nature of the slopes, roads and driveways on the proposed subdivision (sometimes exceeding 10%), the likelihood of there being an abundance of road sand in winter is quite high. The two sediment ponds, based on their depth, seem to

have capacity enough for a large volume of sediment. But over time the effectiveness of the ponds will be compromised by filling due to sediment laden stormwater runoff. The result will be storm water pass-through with sediment deposition ultimately into the wetlands. A dedicated schedule of identifying who is responsible for long term maintenance and a schedule thereof should be instituted.

- Vernal Pools: are typically small, shallow, circular or oblong depressions in the landscape with no permanent inlet or outlet. They fill with water during the wetter periods of the year (spring and late fall) and become drier during the warmer summer months. True vernal pools also support unusually diverse and dynamic assemblages of wildlife. Much of this wildlife is solely dependent on these areas for one or more periods of their life cycle. Because of the absence of permanent water, fish do not live in these ephemeral pools, making them areas attractive to certain animals that would normally fall prey to these carnivorous fish. Impacts from development on the vernal pool wildlife assemblage can be significant. The amphibian life that use the pools as breeding grounds and soon migrate into the surrounding uplands to live out their adult phase and return to the pools only to breed. Modification of these adjacent upland areas therefore would have a significant impact on the associated wetlands. Migration distances vary significantly between species. One literature search turned up figures ranging from a minimum of 200 feet and a maximum of 750 feet with an average of about 525 feet. The wood frog has a significantly larger dispersal range, known to be as far as a half a mile from their host pool. Due to the fact that these pools have no inlets or outlets and rely on groundwater and accumulated surface water for their hydrology they may be very susceptible to changes in their water quality. Therefore, it is a prudent conservation technique to allot these features to the relatively undisturbed open space on the site.

- Vernal Pool Status: Located north of lots 16 and 17 are two and possibly three isolated seasonally ponded wetlands otherwise known as a vernal pools. In the Team wetland reviewer's discussion with Mr. Snarski, soil scientist for the applicant, on 7-18-01 he indicated the potential for the two southern most wetlands being vernal. He noted that in his discussions with the town he had offered to review the pools at a seasonally appropriate time to confirm their status. It was decided this was not necessary due to their protected location within the deeded open space and thus being minimally impacted anyway. Discussion while on the ERT site walk revealed that the chorus of spring peepers has been heard at the suspected vernal pools. But since spring peepers can inhabit many wetland types they are not indicative of vernal pools. However, if photographs can verify the presence of wood frog egg masses, this information would qualify these ponded areas as vernal pools since wood frogs are considered an obligate vernal pool species. That leaves unresolved the status of the northern most site although its location provides no/low impact and based on the above discussion regarding the need for vernal pool isolation on the landscape, the long term health of the system should be guaranteed. Still, a prepared list of prohibited activities

within the open space would prevent, once adopted by the town, future conflicts with these sensitive areas.

- Vernal Pool Drainage ~ Lot 16: The potential vernal pool situated north of lot 17 appears to intermittently drain over lot 17 and onto lot 16. The proposal calls for an interception of this overland drainage at lot 16 and diversion of it into the stormwater system. A description of the drainage entrance into the system and assumptions of maintenance should be presented to the town and/or future lot owner.

- Wetland Crossing ~ Main Road: It is enigmatic that the proposal would observe 100 foot wetland buffers, avoid impacts to the potential vernal pools, and maintain controls to prevent sedimentation of low, often wet elevations but then constrict a 170 foot wide wetland corridor to an eight foot wide passage under the road (the width of the culvert) for the distance of over 100 feet. This proposal would effectively segment the wetland system into two separate entities, much like an hourglass, north and south of the road.

  It is the opinion of the Team wetland reviewer that the loss of 95% of the wetland's functioning width is a burden that the currently healthy and diversely functioning wetland system situated in the middle of its watershed should not have to incur. The consideration of a prudent alternative design(s) should include factors that both reduce the road fill segmenting width and allow for the passage of groundwater under the roadway to prevent groundwater damming and to maintain its downslope flow.

- Wetland Crossing ~ Lot 5 Driveway: Just as the wetland crossing of the main road needs to be closely considered, the driveway crossing on lot 5 is equally if not more sensitive. Below the proposed main road crossing, Plane Brook takes on drainage from at least three mapped intermittent watercourses and becomes a larger watercourse and wetland system as a result. Because of its increase in flow this proposal calls for a 16 foot width to carry the Brook under the road bed. The result of the driveway crossing is that a 76 foot wide wetland corridor is reduced to 16 feet ~ the width of the two side by side culverts ~ for a linear distance of 25 feet. This is a 76% reduction in wetland width. Because more of the mapped wetland here is dominated by flowing surface water than at the main road crossing, the question of maintaining a natural bottom to preserve the integrity of the streambed was raised. While the impact to fisheries will be dealt with in another section of this report, including the need for natural bottom materials, the same comments about segmenting the wetlands by constriction are applicable as described in the main road crossing section above. The Team wetland reviewer believes it is incumbent upon the applicant to maintain a larger percentage of the wetland width with a more prudent wetland resource protection proposal.

- Wetland Crossing ~ Lot 3 Driveway: The driveway crossing at lot three impacts a watercourse which most likely has, as its primary function, the

overland passage of seasonal water flow. Certainly the twin 24 inch side by side culverts would pass the water (based on field conversation regarding general over design of culverts). One consideration to make here is the use of a 48 inch wide box culvert in lieu of two 24 inch round pipes to decrease the chance woody debris would have to clog the opening and force water to flow around the structure. This change in type of passage would have an increase of approximately a 27% of undivided area opening.

- On-Site Sedimentation: the steepness of slope on much of this parcel offers the opportunity for sedimentation concerns during construction. Correct installation and maintenance of silt fence along with adherence to and proper use of stockpiling will help minimize the potential siltation of wetlands and watercourses. Existing water quality has been shown to be high throughout the basin and should be maintained at this level during and after construction. Confirmation of construction phasing with the builder should include an agreement of having hard surfaced roads in place before heavy equipment is on site for house construction.

- Wetland Crossing - Lot 22 Driveway: The crossing at lot 22 is an age old stream crossing that will make use of the existing roadbed for driveway access to the house site. Discussion in the field found this crossing to have withstood the test of time. The builders of this structure likely did not want to have to do the work twice and as a result sized the water passage accordingly to take what they knew, or expected, to be occasional high water. This sizing can be easily duplicated through engineering calculations. But this historic construction offers two environmental aspects not often seen today. First is the overall porosity of the stone construction materials the road bed is built upon. In this case it is clear the stone work construction style allowed the passage of groundwater thereby having less of a wetland segmenting impact than much of the constructed roadway fill used today. This same feature allows for high water passage decreasing the overall upstream damming effect. Second, the stonework construction appears to provide for a natural bottom for the stream it crosses. Groundwater passage and natural stream bed are two issues of key concern in any perennial stream crossing and they seem to have been tackled well in this historical location.

- Minimizing Impervious Surfaces: In an effort to closely mimic the pre-development path of water after development, the minimizing of impervious surfaces is key. In this light some of the design features of the plan are in keeping with the latest concepts. Road width for instance of 24 feet versus wider roads is a big player in this goal with the added benefit that the 24 foot width has been found to be the safest width in suburban settings. Other features to consider are:

    - the use of curbless road/ vegetated drainage swale stretches where slope and safety considerations allow;
    - non-hard surface/porous driveways (gravel, crushed stone, well spaced paving blocks) where slopes allow;

- **vegetated center circles in cul-de-sacs;**
- **and roof drainage discharging directly into the ground.**

In combination all of these efforts, despite the seemingly trivial nature of some, add up to minimizing peak runoffs and serving to maintain a steady groundwater recharge with resulting increased stream flow throughout the year.

Soil and Water Conservation District Review

The following are general comments and recommendations regarding the proposed Deer Ridge Subdivision in Westbrook, CT. The project consists of 22 residential homes to be constructed on approximately 143 acres. The comments are based on a review of a: 1"= 40' site plan dated January 26, 2001, 1"= 40' storm water renovation pond plan dated April 19, 2001, Drainage Analysis prepared for Deer Ridge dated February 19, 2001, and a site visit conducted on July 11, 2001. These comments are advisory in nature and are intended to assist the Westbrook Planning, Inland Wetlands and Watercourses, and Conservation Commissions in their charge.

Site Description

The Deer Ridge subdivision site is located in the Menunketesuck River Watershed. Wetlands and hilly terrain with moderate to steep slopes and bedrock outcrops characterize the site. Trees and shrubs cover the majority of the site. Canopy cover is greater than 75 percent.

Plane Brook and an unnamed brook, flow from north to south across the property. Plane Brook crosses lots 3-6, 21, and 22 on the eastern side of the site. The unnamed brook crosses the open space area along the western portion of the site. According to the drainage analysis prepared by Angus McDonald, Gary Sharpe & Associates, Inc., approximately 60% of the water from the site drains into Plane Brook, with the remaining water draining into the unnamed brook. Both brooks eventually flow into Chapman's Pond, the Menunketesuck River and associated tidal wetlands, and finally into Long Island Sound. The water quality for the brooks and downstream watercourses is Class A. This designation indicates that the watercourses are not impaired by pollution.

The proposed residential development will significantly alter the existing site as:

- vegetation is removed and impervious surface area is increased,
- wetlands are filled,
- the topography and surface drainage patterns are changed by grading,
- groundwater flows are redirected, and
- future property owners create new landscapes for their individual lots.

Careful design and sound construction practices can minimize the adverse impacts of residential development and protect the water quality of the brooks, downstream watercourses, and tidal wetlands.

Soils

The soil types were not shown on the January 26, 2001 site plans. Soil information was obtained from the Soil Survey of Middlesex County.

Connecticut, 1979. The soils are a mix of: Canton and Charlton very stony and extremely stony fine sandy loams (3-8% and 15-35% slopes), Charlton-Hollis very stony fine sandy loams (3-15% slopes), Hinckley gravelly sandy loam (3-15% slopes), Hollis-Charlton extremely stony fine sandy loam (15-40% slopes), Paxton and Montauk very stony fine sandy loam (3-8% slopes), and Leicester, Ridgebury & Whitman extremely stony fine sandy loams (wetland soils).

The soils have the potential to be moderately-to-highly erodible, with the exception of the wetland soil complex, Leicester, Ridgebury, & Whitman. Steeply sloped areas of Paxton and Montauk soils are susceptible to slumping when excavated.

Soil Description	Erosion Hazard
Canton and Charlton very stony fine sandy loams (3-8% slopes)	moderate hazard
Canton and Charlton extremely fine sandy loams (15-35% slopes)	severe hazard
Charlton-Hollis very stony fine sandy loams (3-15% slopes)	moderate to severe hazard
Hinckley gravelly sandy loam (3-15% slopes)	moderate hazard
Hollis-Charlton extremely stony fine sandy loam (15-40% slopes)	severe hazard
Paxton and Montauk very stony fine sandy loam (3-8% slopes)	moderate hazard
Leicester, Ridgebury & Whitman extremely fine sandy loams	wetland soils

Recommendation:

- Request that the soil types are shown on the site plans.

Erosion and Sediment Control

Erosion and sediment control will be critical given the hilly terrain, steep slopes, erodible soils, and proximity to the wetlands. Road construction for this development involves significant cuts and fills. Construction of the steeply sloped development road and proposed driveways will erode and channel water and sediment to wetland areas during the early development phases even with erosion and sediment controls in place. Substantial erosion within the wetlands can also occur during construction of the four wetland crossings. The primary goal on this site is to minimize erosion and sediment loss during the early phase of construction. Appropriately designed, installed, and maintained erosion and sediment controls will reduce the amount of erosion and sediment loss, reduce the amount and total cost for replacement fill, protect water quality, protect upland and wetland habitat.

Road construction will require careful layout to prevent erosion. The road slopes downward at an approximately ten percent grade from the site entrance at Rt. 145 to the wetland crossing between lots 4 and 19. The 24-foot wide road is bordered by a 5-foot sidewalk on the southeast side and a 25-30 percent

downsloping shoulder on the northwest side. Drainage from lot 2 will concentrate along the south side of the road.

Significant gully erosion was observed on the existing dirt road that traverses the site during the July 11, 2001 site visit. The eroded areas will deepen and expand during early phase road construction. Stabilizing the site and diverting water off the road before it reaches the base of the ten degree slope is necessary in order to reduce erosion and sediment impacts on the wetlands.

The proposed driveways are another source of significant erosion and drainage problems. Overall, the majority of the driveways are steep with slopes exceeding 10 percent and are long with driveway lengths exceeding 170 feet. Several shared driveways to service lots 4~5, 10~11, and 18~21 were designed to circumvent wetland areas and hilly terrain. However, these driveways are exceptionally steep (generally slopes of 12~16 percent), long (500~1650 feet), and have at least one steeply curved segment (slopes of 12~16 percent).

Specific wetland areas that are particularly susceptible to erosion from the road and the driveways include:

- the proposed road and driveways that cross the wetlands on lots 2~6, 19, and 22.
- wetland areas on for adjacent to lots 2, 3, 20~22 that are located directly downslope from road and driveways with steep slopes of 12~35 percent.
- wetland areas on or adjacent to lots 3, 4, 7, 10, 15, 19, 20 and 22 that are located directly downslope from proposed house locations with steep slopes of 11~30 percent.

Other areas on the Deer Ridge site that are susceptible to erosion include:

- driveways with slopes greater than 10 percent on lots 3~ 6, 10~13, 17~22.
- driveways longer than 170 feet (3~5, 8~12, 15~22). The majority of these driveways have steep segments with slopes exceeding 10 percent. Driveways for lots 8, 9, 15, and 16 have slopes less than 8 percent, but will channel water and create both drainage and erosion problems.

Angus McDonald, Gary Sharpe & Associates, Inc. submitted an erosion and sediment control plan that includes provisions for silt fences, baled hay erosion checks, and a seeding plan. Additional comments regarding the plan are discussed below.

<u>Recommendations:</u>

- Request that a complete narrative of the project with details regarding the maintenance program for all proposed erosion and sediment controls be included on the final plan Specifically, the name of the person responsible for installation and maintenance of erosion and sediment control measures

during construction and the name of the person responsible for overseeing the maintenance of permanent controls after the project is completed.

- Exposed areas should be temporarily seeded to reduce erosion as soon as possible. Specifically, stockpiles should be seeded within 15 days of formation per Connecticut's Guidelines for Soil Erosion and Sediment Control with sediment barriers erected around the stockpiles. Mulch should be applied to all areas immediately following seeding to aid growth and protect the exposed soil surface. Mulch should also be applied to areas that cannot be seeded within the seeding dates.

- Request that a construction sequence and dewatering plan is developed to address erosion and sediment control concerns for installation of the road, driveways, and wetland crossings.

- Request that silt fence is installed:
  - ⇒ Along the southeast side of the road between the entrance to the site and the proposed driveway entrance for lot 1. The purpose of the silt fence at this point is to protect lot 1 from eroding fill on the steep shoulder.
  - ⇒ On lot 17 between the road and the recontoured area.

- Request that the design specifications are shown for the plunge pool with modified rip rap and level spreader shown on lot 1 on page 4 of 16

- Request that a construction entrance pad for the proposed development road is shown on the plan. The current plan only shows the design specifications for a construction entrance pad, but not the location of the construction entrance pad. Consider stockpiling extra rip rap to maintain the entrance.

- Request antitracking pads for individual lots when house construction begins.

- Request that road diversions are incorporated into the erosion and sediment control plan especially for the road segments with 10 percent downsloping grade. Request that driveway diversions are incorporated into the erosion and sediment control plan especially for driveways longer than 100 feet and/or with a slope greater than 5 percent.

- Clarify the purpose of the haybale check dam that is approximately 90 feet southwest of the wetland crossing.

- The CT DEP requires that applicants obtain a general permit for the discharge of stormwater and dewatering wastewaters for construction activities that result in the disturbance of five or more acres. As part of this general permit, the CT DEP requires temporary sediment storage to retain a minimum of 1.34 cubic yards of water per acre for any disturbed area over two acres.

During the later phase of road construction after the drainage system is completed, it might be possible to use the proposed detention basin A as a sediment basin.

- Consider constructing one or two temporary sedimentation basins on lots 2, 3, 21 and/or 22 and diverting runoff to the basins during early road construction when the catch basins are not in place in order to protect the wetland corridor.

- As each lot is developed, ensure that adequate erosion and sediment control measures are installed and maintained especially for lots with:
  - ⇒ driveways immediately adjacent to wetlands (lots 3, 5, and 22)
  - ⇒ steep and/or long driveways (lots 3-6, 8-13, 15-22)
  - ⇒ significant surface drainage from areas upslope of house locations (lots 12, 16, 18, 22)

Wetlands and Watercourses

Wetlands occupy approximately 21 acres on the site. Proposed road and driveway crossings will impact approximately 0.25 acre of wetlands. Although the impacted area represents only one percent of the entire wetlands, the crossings could constrict the wetland corridor by reducing water flow through the area and partially damming groundwater flow. As a result, downstream habitat would be deprived of water and upstream habitat could be flooded.

During the July 11, 2001 site walk meeting, questions were raised regarding the impact of different types of crossings. Specific concerns included: Which crossing type is preferred for this site: standard box culverts, open-bottom box culverts, or bridges with piers? What are the advantages and disadvantages of each crossing type? What are the maintenance costs associated with each crossing type? What are the impacts of repairs and replacement for each crossing type?

A detailed alternatives assessment was not available. Alternatives listed on the Westbrook Inland Wetlands and Watercourses application included:

- Purchase adjacent property: The "applicant has discussed purchasing the property to the south (Miele), but this would still require wetland crossings."
- Relocate road: "Relocating the road would require additional wetland filling since the proposed crossings are at the narrowest point."

A 50-foot right of way between lots 8 and 9 that ends at the end of the property line for the site has been proposed. The right of way would connect to Clinton or Horse Hill Road in the future, but would require a wetland crossing.

Recommendations:

- Request that the area of wetland impacts to be temporarily and permanently disturbed is specified on the plans. How much fill will be needed? Is an Army Corps of Engineers general permit necessary? Is a CT DEP water diversion permit needed?

- Request that the applicant provide a more detailed assessment of the alternatives for wetland crossings. A discussion regarding the impacts of eliminating all crossings and eliminating lots 3-5, and as well as a comparison of standard box culverts, open-bottom culverts, and bridges with piers should be included within the alternatives assessment. The comparison of road and driveway crossings should include the advantages and disadvantages, maintenance costs, and the impact of repairs and replacement of each method. The rationale behind each alternative should be presented so that the Westbrook Planning, Inland Wetlands and Watercourses, and Conservation Commissions have sufficient information to make an informed decision regarding maintaining the integrity of the wetlands and reducing the impact of the road and driveway crossings on the wetlands.

- Request that the specifications for the culvert or bridge design are shown on the site plan.

- Request that the 100-foot review area is shown on the site plans. The road is within the 100 foot review wetland review area at the boundary of lots 3, 4, 19, and 22.

- Request that the existing vegetation surrounding Plane Brook and the wetlands be protected to the maximum extent possible in order to protect plant and wildlife habitat within the wetland corridor.

- Consider that developing lots 3, 4-5, and 20-21, and 22 will fragment the wetland habitat.

- Consider redesigning lot 21 to protect the adjacent wetlands. Lot 21 was designed to accommodate horses. The potential exists for the future property owners to construct additional wetland crossings for horse trails.

Vernal Pools

Three potential vernal pools were observed during the site walk. One potential vernal pool was observed west of lot 17 and two pools were south of lot 20.

Vernal pool organisms spend the majority of their life in upland habitat away from the pool. Alterations in the upland habitat such as significant cuts and fills and extensive grading associated with road and driveway construction will change the topography, vegetation, and hydrology of the existing upland habitat. These changes can adversely affect vernal pool organisms that are living in the

upland areas. Consequently, road, driveway, and house construction will potentially displace existing vernal pool organisms, impede future migration, and reduce the population of these organisms.

Recommendation:

- Consider the short and long-term impacts of developing and removing upland habitat on potential vernal pools located near lots 17 and 20.

Stormwater Quality

Stormwater quality measures cited in the site plan include catch basins with 2 feet deep sumps, scour pads at culvert outlets, and stormwater retention in Pond A and stormwater detention in Pond B. However, specific design elements for removing pollutants from stormwater were not included in the plan. Although detention basins will remove some solids, they are not specifically designed for stormwater quality improvement.

Recommendations:

- CT DEP's general permit for the discharge of stormwater and dewatering wastewaters from construction activities requires treatment of at least 80 percent of the suspended solids from the post construction site. It is unclear whether the retention basins will remove 80 percent of suspended solids. While the town is not responsible for compliance with stormwater regulations, if additional treatment is required by the DEP, the treatment measures should be shown on the plan prior to final approval. A number of best management practices are available. The District can provide assistance if additional information is needed regarding the specific measures.

- Develop a stormwater pollution control plan.

Stormwater Management Review

Stormwater Permitting

Since the site construction involves the disturbance of over five acres, Connecticut's General Permit for the Discharge of Stormwater and Dewatering Wastewaters (the "Permit") will cover the project. The permit requires that the site register with the Department of Environmental Protection (CTDEP) at least 30 days before the start of construction. The registrant must also prepare, submit and keep on site during the construction project a Stormwater Pollution Control Plan (the "Plan").

Due to the size and potential impacts on natural resources of this project, the Department has recommended to the developer that the pollution control plan be submitted 180 days prior to the start construction. If the Department finds that the Plan is inadequate, Connecticut General Statutes Section 22a-430b and general permit Section 7(c) allow the Commissioner to require an individual permit, a process that could delay approval of the project for several months. In order to prevent this and to ensure adequate review time, the Department has requested early submittal of the plan.

Please note that while this review is based primarily on the state Permit, many of the erosion and sedimentation issues are included in the Connecticut Guidelines for Soil Erosion and Sediment Control (the "guidelines"), and are issues that must be dealt with on a local level before being included in the Plan. It should also be noted that the permit requires compliance with the guidelines. The developer must register for the permit, and the contractor and any subcontractors involved in grading must sign the contractor certification statement in the permit. Any registration submitted by anyone other than the developer will be rejected.

The Plan must include a site map as described in Section 6(b)(6)(A) of the General Permit and a copy of the erosion and sedimentation (E & S) control plan for the site. The E & S plan that has been approved by the Town in conjunction with the CT DEP Inland Water Resources Division (IWRD) and the local Soil and Water Conservation District may be included in the Plan. This plan and site map must include specifies on controls that will be used during each phase of construction. Specific site maps and controls must be described in the Plan, as well as construction details for each control used. The permit requires that "the plan shall ensure and demonstrate compliance with" the guidelines.

Due to the amount of soil disturbance, one of the best ways to minimize erosion potential is to phase construction in order to minimize unstable areas. The Plan must be flexible to account for adjustment of controls as necessary to meet field conditions. At a minimum, the plan must include interior controls appropriate to different phases of construction.

This site has slopes, and large amounts of wetland that must be protected, which will make weekly inspections and modifications to erosion controls an important part of this project. The permit (Section 6(b)(6)(D)) requires inspections of all areas at least once every seven calendar days and after every storm of 0.1 inches or greater. The plan must also allow for the inspector to require additional control measures if the inspection finds them necessary, and should note the qualifications of personnel doing the inspections. In addition, the plan must include monthly inspections of stabilized areas for at least three months following stabilization and the end of construction. Due to the scope and potential wetland and stream impacts of this project, there must be someone available to design and adjust E&S controls for changing site conditions, who has the authority and resources to ensure that such necessary changes are implemented. Due to the size of the project the Department during construction may require a full time erosion and sediment control inspector, approved by the Department.

Section 6(b)(6)(Ciii) of the permit requires the plan to address dewatering wastewaters that this site may generate. Specific details for construction control during installation of all wetland crossings must be provided.

Particular attention must be paid to the 15-foot slope at the entrance of the site off Route 145 .

Post-construction Stormwater Treatment

The permit (Section 6(b)(6)(C)(iii)) requires that the plan include a design for post-construction stormwater treatment of 80% of total suspended solids from the completed site. In order to comply with this requirement, the Department recommends incorporating swirl concentrator technology. Although swirl concentrators are effective at removing sediment, they require a long term maintenance commitment from the town or a homeowners association greater than that required for a basin once it is fully grown-in and stabilized. If an in-ground, "black-box" solution is used, swirl concentrator technology is a minimum requirement. Some newer generation swirl concentrators also incorporate filtration systems to address other pollutant issues, but these also require long-term maintenance plans.

Erosion and Sediment Control Notes

General permit stabilization requirements include the following: "where construction activities have permanently ceased or have temporarily been suspended for more than seven days or where final grades are reached in any portion of the site, stabilization practices shall be implemented within three days".

Other Issues

It is strongly recommended that the local wetland and zoning commissions ensure that the bond required for this project be adequate to remediate all

wetlands and watercourses in the event of control failures on this site. The developer should be aware that regardless of the storm size event, he would be responsible for remediation of any impacts. The developer indicated that lots would not be individually sold off. However, if that changes, the developer must also be aware that if lots are sold off to individual homeowners, the developer is still responsible for maintenance of all control structures for three months after final stabilization of the site.

This section of the ERT report addresses some of the major issues concerning the project and does not constitute a complete review of the Plans for permitting purposes.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area have been reviewed. According to our information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species occurring at the site in question.

Natural Diversity Data Base information includes all information regarding critical biologic resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating Units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Fisheries Resources

Fisheries Resources

Plane Brook, a tributary of the Menunketesuck River, runs through the property. Due to its small size, this type stream is often overlooked as far as its relative importance as an aquatic resource. However, this small perennial stream supports a viable fish community comprised of blacknose dace observed during the Team fisheries biologist's field review. Although not observed, its possible that the stream may support a native brook trout population based upon instream habitat characteristics and ambient water temperature. One of the more important functions of this stream is to provide clean and unpolluted waters to downstream areas of the watershed, which contain an increased diversity of aquatic organisms. Within the proposed subdivision property, the stream is of low to moderate gradient. Albeit variable, most mesohabitat is in the form of short stretches of riffle/pool habitat that contains small to medium size gravels, coarse sand and small cobbles. Most coarse sands that are present in the stream are due to surface water runoff from the unimproved roadway. The stream is well shaded with a very tight, closed overhead canopy.

Impacts

Stream Crossings: Fish Passage and Habitat Concerns

The proposed subdivision will cross Plane Brook at two new locations, one involves the installation of 4' x 8' box culvert associated with the construction of the main road and the other involves placement of twin 4' x 8' box culverts associated with driveway construction for Lot #5. These stream crossings were not designed with fish passage in mind, thus, if culverts are installed as proposed, upstream fish passage will be impeded and the existing fish community will become separated due to habitat fragmentation. Culverts installed "at grade" will impede fish passage by creating insufficient water depths or sheet flow conditions during low flow periods and high water velocities during storm events. In addition, culvert floors replace the natural stream materials with an artificial man-made surface.

The culvert installation for the new roadway is being installed at an acute angle, which eliminates a meander bend of stream approximately 40 feet in length. This aspect of the installation results in a direct loss of stream habitat. In addition, the culvert slope of 2.6 % also presents impediments to upstream fish passage.

Scour holes are being proposed at the downstream side of each culvert outlet. These holes which are to be armored with riprap modify existing habitat by changing the geomorphic characteristics of the stream through the creation of an oversized wide and deep hole that will accumulate fine sediments. Also, the placement of riprap to be used as a top layer of streambed armoring in lieu of natural substrates represents an unfavorable medium for the colonization of macroinvertebrates and for use as habitat by juvenile and adult finfish.

Vegetation Alteration Adjacent to Plane Brook Riparian Zone

A significant amount of disturbance will occur adjacent to riparian wetlands of Plane Brook, in particular related to the construction of stormwater pond "B", Lot #5. Vegetation removal will occupy up to the wetland edge, which in this area closely approximates the edge of Plane Brook channel. Riparian vegetation serves several vital functions in the maintenance of biologically diverse stream and riparian ecosystems. Vegetated riparian ecosystems (1) naturally filter sediments, nutrients, fertilizers, and other non-point source pollutants from overland runoff, (2) maintain stream water temperatures suitable for spawning, egg and fry incubation, and rearing of resident finfish, (3) stabilize streambank stream channels thereby reducing instream erosion and aquatic habitat degradation, (4) supply large woody debris to streams providing critical instream habitat features for aquatic organisms, (5) provide a substantial food source for aquatic insects which represent a significant proportion of food for resident finfish, and (6) serve as a reservoir, storing surplus runoff for gradual release into streams during summer and early fall base flow periods.

Recommendations

The following recommendations are provided to minimize impacts to fisheries resources:

1. Stream Crossings

A. Proposed Roadway

The 4' by 8' culvert should be sunken 6-12 inches below grade to provide more favorable fish passage conditions and be repositioned to the west in order to mitigate impacts associated with the permanent elimination of 40 feet of stream habitat. The repositioned culvert will reduce overall culvert length, which will also serve to minimize impacts to instream habitat.

It is recommended to provide for scour protection without the creation of a large scour hole by utilizing existing onsite substrates with a sublayer of riprap. The existing streambed surface layer could be scraped, saved and then placed back as a top streambed amourment over a sublayer of riprap. This strategy commonly utilized at State roadway crossings can satisfy both engineering concerns for scour protection as well as fisheries concerns for preserving instream habitat and natural streambed substrates in this area. This work should only be confined to the 8 ft. wide stream channel.

Native trees and shrubs should be planted at the crossing to mitigate for loss of streamside vegetation due to project development. Vegetation re-establishment is required to not only help stabilize slopes and soils but to eventually re-establish a streamside overhead canopy that shades the stream and helps prevent increases in surface water temperatures.

B. Stream Crossing at Lot #5

Only one of the twin 4' x 8 ' culverts should be sunken 6-12 inches below stream grade. The sunken culvert should be positioned so as to "line-up" with the existing geometry of the Plane Brook channel in this area. The sunken culvert will handle most daily stream flows with the culvert placed at grade to accommodate large storm events. As with the stream crossing at the main road, the streambed surface layer could be scraped, saved and then placed back as a top streambed armourment over a sublayer of riprap and vegetation re-establishment will be necessary.

C. Existing Perched Culvert

There is an existing 24-inch round concrete culvert that conveys Plane Brook under the unimproved road, adjacent to wetland Flag #118, Lot 22. This culvert is perched several inches above the streambed preventing upstream fish passage. It is recommended to remove this culvert and stabilize streambanks with native trees and shrubs.

2. Buffer Zone

It is highly recommended that at a 100 foot riparian buffer zone be maintained along the wetland boundary associated with Plane Brook. This buffer is one of the most natural mitigation measures to protect the water quality and fisheries resources within Plane Brook. See attached DEP Fisheries Division policy on riparian corridor protection for specifics and justification.

3. Construction Timeframe

It is critical that proper erosion and sedimentation controls must be installed and maintained throughout the duration of this project. Care should be exercised so as not to increase turbidity levels. As a best management practice, any unconfined instream work within Plane Brook should be restricted to the period from June 1 to September 30, inclusive. A June 1 through September 30 timeframe can be utilized as an effective mitigation measure for construction related disturbances due to the following reasons: (1) timeframe will serve to protect the spawning, egg incubation, and fry development of resident fishes, (2) timeframe does not interfere with seasonal migratory behaviors, and (3) timeframe coincides with historic low rainfall levels in Connecticut a period in which instream construction activities such as dewatering, excavation, trenching, and cofferdam placement are most effective.

DEPARTMENT OF ENVIRONMENTAL PROTECTION
INLAND FISHERIES DIVISION

POLICY STATEMENT
RIPARIAN CORRIDOR PROTECTION

I. INTRODUCTION, GOALS, AND OBJECTIVE

Alteration and exploitation of riparian corridors in Connecticut is a common event that significantly degrades stream water quality and quantity. Inasmuch as riparian ecosystems play a critical role in maintaining aquatic resource productivity and diversity, the Inland Fisheries Division (Division) recognizes that rigorous efforts are required to preserve, protect, and restore these valuable resources. Consequently, a riparian corridor protection policy has been developed to achieve the following goals and objective:

Goals

Maintain Biologically Diverse Stream and Riparian Ecosystems, and

Maintain and Improve Stream Water Quality and Water Quantity.

Objective

Establish Uniform Riparian Corridor Buffer Zone Guidelines.

II. DEFINITIONS

For the purpose of implementing a statewide riparian corridor protection policy, the following definitions are established:

Riparian Corridor: A land area contiguous with and parallel to an intermittent or perennial stream.

Buffer Zone: An undisturbed, naturally vegetated area adjacent to or contained within a riparian corridor that serves to attenuate the effects of development.

Perennial Stream: A stream that maintains a constant perceptible flow of water within its channel throughout the year.

Intermittent Stream: A stream that flows only in direct response to precipitation or which is seasonally dry.

III. RIPARIAN FUNCTION

Naturally vegetated riparian ecosystems perform a variety of unique functions essential to a healthy instream aquatic environment. The delineation and importance of riparian functions are herein described. Vegetated riparian ecosystems:

* Naturally filter sediments, nutrients, fertilizers, and other nonpoint source pollutants from overland runoff.

* Maintain stream water temperatures suitable for spawning, egg and fry incubation, and rearing of resident finfish.

* Stabilize stream banks and stream channels thereby reducing instream erosion and aquatic habitat degradation.

* Supply large woody debris to streams providing critical instream habitat features for aquatic organisms.

* Provide a substantial food source for aquatic insects which represent a significant proportion of food for resident finfish.

* Serve as a reservoir, storing surplus runoff for gradual release into streams during summer and early fall base flow periods.

IV. RIPARIAN CORRIDOR BUFFER ZONE GUIDELINES

Recognizing the critical roles of riparian corridors, the Division provides buffer zone guidelines that are designed to bring uniformity and consistency to environmental review. The guidelines are simple, effective, and easy to administer. The following standard setting procedure should be used to calculate buffer zone widths.

Perennial Stream: A buffer zone 100 feet in width should be maintained along each side.

Intermittent Stream: A buffer zone 50 feet in width should be maintained along each side.

Buffer zone boundaries should be measured from either, (1) edge of riparian inland wetland as determined by Connecticut inland wetland soil delineation methods or (2) in the absence of a riparian wetland, the edge of the stream bank based on bank-full flow conditions.

The riparian corridor buffer zone should be retained in a naturally vegetated and undisturbed condition. All activities that pose a significant pollution threat to the stream ecosystem should be prohibited.

Where the Division policy is not in consonance with local regulations and policies regarding riparian corridor buffer zone widths and allowable development uses within these areas, local authorities should be encouraged to adopt the more restrictive regulations and policies.

12/13/91
Date

James C. Moulton
Acting Director

Wildlife Resources

Wildlife Habitats and Values

The Deer Ridge property is primarily comprised of closed-canopy, mixed hardwood forest dominated by oak (red, white, black), hickory and birch. Softwood cover is lacking on the property with exception to some small remnant stands of red cedar that are dead or dying from being shaded-out by mature hardwood trees. Two high-quality forested wetland systems (including Plane Brook and its tributaries), dominated by red maple and yellow birch, traverse the property. Other important habitat features include rocky outcroppings and potentially two or more vernal pools. The overall value of the property to wildlife is high given its unfragmented character, its location within a large corridor of contiguous forest extending to the north, and the presence of two structurally-diverse wetland systems.

Uplands

Mature hardwood forests provide an abundance of food in the form of buds, catkins, hard mast, berries and insects for wildlife. Acorns are an especially valuable, high-quality food item consumed by a variety of mammals and birds (e.g., white-tailed deer, eastern wild turkeys, black bears, gray squirrels, southern flying squirrels, eastern chipmunks, white-footed mice and blue jays.) Snags (dead standing trees), large-diameter den trees and downed logs also provide shelter and nest sites for wildlife (e.g., short-tailed weasels, short-tailed shrews, eastern chipmunks, fishers, snakes, salamanders, owls, woodpeckers, songbirds.) The rocky outcroppings on the property may be used as den sites by snakes, raccoons, coyotes, foxes, fishers, and bobcats. The property's value to mammals and birds that require large tracts of continuous forest (e.g., forest interior nesting songbirds, fishers, bobcats) is relatively high given that the property is unfragmented and connected to undeveloped lands and protected open space to the north that are predominately forested.

Wetlands

Forested wetlands typically contain a high abundance of insects and dense undergrowth of herbaceous plants and berry-producing shrubs. Leaf litter and woody debris (e.g., logs, stumps and downed limbs) add to the structural diversity of these wetlands and contribute to a healthy forest ecosystem by returning nutrients to the soil and providing cover for small mammals, birds, reptiles and amphibians. Many species of birds use forested wetlands at varying times of the year for breeding, feeding and shelter (e.g., wood thrush, northern waterthrush, common yellowthroat, veery, eastern phoebe, American woodcock, red-shouldered hawk, and barred owl.) Other wildlife likely using this habitat for food and cover include raccoon, short-tailed weasels, star-nosed moles, wood frogs, pickerel frogs, northern spring peepers, gray tree frogs, and eastern garter snakes. Examples of birds which use forested wetlands as well as nearby upland forests include American robin, tufted titmouse, hermit thrush, dark-eyed

junco, gray catbird, rufous-sided towhee, white-throated sparrow, woodpeckers (downy, hairy and pileated), white-breasted nuthatch, broad-winged hawk and eastern wild turkey.

Riparian zones, the vegetated areas bordering rivers or streams such as Plane Brook, help protect water quality and provide valuable food and cover for wildlife. Riparian zones are used by nearly 70% of all vertebrates and are often used as travel corridors. A description of the potential vernal pools and their importance as wildlife habitat is provided in the Wetland Resources section of this report.

Wildlife Impacts

As forests become fragmented and replaced by development and roads, habitat quality and wildlife diversity decline and the potential for wetland and water quality degradation increases. Many species of neotropical migratory songbirds (e.g., thrushes, vireos and warblers) that nest in Connecticut and migrate to Central and South America for the winter are greatly effected by forest fragmentation. Although the home ranges of individual birds may be relatively small (2 to 10 acres), the maximum probability that these species will occur in a given area is greatest when available forested habitat is large (100 to 1,000 acres). Research has shown that forest patches smaller than 100 acres have a low density and diversity of forest interior breeding birds. High rates of cowbird parasitism and nest predation by house cats, raccoons, skunks and other predators have been documented where small patches of forest are surrounded by residential development and open habitats. Evidence suggests that the effects of an edge (fragmentation) can extend 150 to 300 feet into the forest interior. The abundance of more common "generalist" species (e.g., raccoon, Virginia opossum, striped skunk, grey squirrel, white-tailed deer, house wren, northern flicker, European starling, song sparrow, brown-headed cowbird, northern oriole, house finch, American crow) can be expected to increase on the Deer Ridge property following site development. Although some bird species that require large tracts of continuous forest likely will still use the property, a decline in species abundance and reproductive success may occur due to the potential for increased predation and human disturbance.

The value of the eastern wetland complex to wildlife likely will decline due to habitat loss, fragmentation and the potential for water quality degradation. Of particular concern is the potential impact of this development on amphibians. Because amphibians have small home ranges, relatively limited dispersal capabilities and high site fidelity, they are highly sensitive to local environmental changes. The uplands surrounding vernal pools and other temporary wetlands are an integral part of the wetland systems amphibians require for survival. Species such as the bullfrog, snapping turtle, painted turtle and brown snake that are able to adapt to living in ponds and other human-altered habitats are becoming more common in Connecticut and replacing species like the wood frog and spotted turtle that need a diversity of wetlands connected by undisturbed uplands. Studies have shown that wood frogs and some salamanders may move up to a half mile or more from their breeding pools

into adjoining upland habitats to feed and overwinter. Road systems can serve as barriers to this movement and can significantly impact amphibian populations through direct mortality (roadkills) where roads intersect major migration and dispersal routes. Other barriers, such as curbing, berms and drainage ditches, can trap amphibians or cause them to divert from their normal migration routes and increase their susceptibility to predation. Reptiles and small mammals can be similarly effected by these barriers.

Recommendations

The following recommendations should be considered to reduce impacts to wildlife during and following site development. Primary emphasis should be placed on maintaining as much continuous forested habitat as possible and protecting the wetlands from pollution and sedimentation.

1) Avoid conducting land-clearing activities during the peak bird nesting period from mid-April through mid-July.

2) Retain healthy, mature trees along the road, driveway and powerline cuts; future expansion of their crowns will help to reduce forest fragmentation.

3) Plane Brook, its tributaries and all wetlands on the property should be protected by a conservation easement. A minimum 100 foot buffer of vegetation should remain undisturbed adjacent to all wetlands to help filter and trap sediments, excess nutrients and pollutants and reduce disturbance within the wetland. Consideration should be given to eliminating Lots 4 and 5 from the proposal. Consideration also should be given to limiting the amount of manicured yard space (1 acre) on Lots 20 and 21 and placing the remainder of the acreage under conservation easement. The easement should restrict further development and promote the retention of primarily wooded habitat. Easements should not prohibit landowners from conducting accepted conservation practices (e.g., timber stand improvement, wildlife habitat enhancement) with assistance from a certified forester or wildlife biologist. The restrictions and uses for all easement areas should be clearly defined and incorporated into the deed of record and the boundaries marked in the field.

4) To optimally protect amphibian populations in a given area, an investigation would be required to identify breeding sites (e.g., vernal pools) and migration and dispersal routes so that roads and development can be directed away from these critical areas. In the absence of this information however, effects on amphibians can be reduced by:

- avoiding direct impacts to wetlands and watercourses (e.g., filling and hydrologic changes) and maintaining a connection between vernal pools and other wetland complexes;

- maintain water quality through a reduction of impervious surfaces, implementation of an aggressive sediment and erosion control plan, and eliminating direct discharges of stormwater into breeding pools,

- reducing barriers to migration by staggering haybales and silt fences in shorter lengths during site construction and eliminating the use of curbing where possible (where necessary, Cape Cod style curbs, i.e., curbs at 45 degree angle, are recommended; silt fences should be removed following site stabilization); and

- using open bottom arched culverts and similar designs, e.g., span bridges, at wetland crossings to maintain natural stream bottom/habitat conditions.

5) Property owners should be encouraged to use natural landscaping techniques that avoid or minimize the creation of manicured grass and chemical applications. A variety of native plantings that will provide a wide array of habitat values and take into account seasonal changes in cover and food availability would be most beneficial. Portions of lawns can be designated as "low maintenance" areas where weeds, grasses and wildflowers can grow tall. This will provide habitat for butterflies and other insects and help reduce maintenance costs. These areas will need to be mowed once a year to keep out invading shrubs. A publication developed by the Connecticut Wildlife Division entitled, "Enhancing Your Backyard Habitat For Wildlife", provides guidance for assessing wildlife habitat and describes methods for improving habitat and wildlife diversity in both rural and urban landscapes. This publication may be obtained by contacting the Connecticut DEP Wildlife Division at 860-675-8130.

6) There was some discussion regarding the creation of an access and possible trail system through the open space. A narrow, passive-use recreation trail with a natural substrate, one that would require minimal vegetation removal, maintain forest canopy closure and prohibit the use nonmotorized vehicles, would have the least impact on wildlife. Traversing wetlands and steep slopes should be avoided whenever possible to minimize erosion and sedimentation problems. A plant and wildlife/habitat inventory should be conducted to assist in locating the trail away from sensitive resource areas. Development of an informational leaflet or sign describing the resource values of the property would enhance the trails value.

The potential impact of the trail on private property owners also should be considered. Ideally, the portion of trail along the access strip should be established during the development process and potential buyers made aware of its presence. To help avoid potential conflicts between private property owners and trail users (e.g., trespass, lack of privacy) the trail and boundaries of the open space should be well-marked. Given the close proximity of the access to the proposed house location on Lot 15, the access should be shifted to the east, if site conditions warrant, or its width increased to at least 50 feet.

Archaeological Review

A review of Connecticut Archaeological Site files and maps show a prehistoric Native American archaeological site in the project area. The site (CT 154-16) is located along the western boundary of the project area across from a pond associated with Camp Hador, and appears to represent a hunting-gathering camp of unknown time period (see Figure 6). Interior swamp/wetland areas were often used by Native Americans for thousands of years. Indian hunting and gathering economies required the movement of peoples through ecological territories on a seasonal basis. Interior wetland areas would have provided an abundance of natural resources for exploitation, as well as areas of protection from winter elements. In addition, the project area has many ledges of rock outcropping that could have served as potential rock shelters for Indians during these seasonal rounds. The Deer Ridge project area contains the topographic and environmental variable that allow us to predict prehistoric utilization.

The Office of State Archaeology strongly recommends an archaeological survey be undertaken for the project area in order to professionally identify, evaluate, and manage all archaeological resources, including the relocation of CT Site 154-16. This survey should be conducted in accordance with the Connecticut Historical Commission's "Environmental Review Primer for Connecticut's Archaeological Resources". The Office of State Archaeology is prepared to provide any technical assistance in conducting the recommended survey.

Figure 6

Deer Ridge Subdivision 7-9-2001

2 mile Buffer Around Project Area
Project Location
National Register (point)
Reported Archaeological Sites
Historic
Prehistoric
National Register (polygon)

Planning Review

The following comments are offered based upon review of the subdivision for planning considerations:

East-West Roadway Connection
to Abutting Saddle Hill Reserve Subdivision in Clinton

In the Estuary region, the north-south trending ridge topography and intervening wetlands have meant that the majority of the area's major thoroughfares also trend in the north south direction. As a result, it has been common for municipal policies to promote the less common east-west connections wherever such opportunities presented themselves. The subject Westbrook property provides such an opportunity. Specifically, the subject property is located immediately east and adjacent to a recent subdivision approved by the Clinton Planning & Zoning Commission, Saddle Hill Reserve. As a result of regulation requirements and the desire of the Clinton P&Z to provide such east-west roadway connection opportunities, the Saddle Hill Reserve roadway was approved in a location which terminates at the Lot 10 boundary within the proposed Deer Ridge subdivision. At the time of the review of Saddle Hill Reserve, the Westbrook Planning Commission went on record supporting a design which provided for the opportunity for future connection to Route 145. The stated intention was to provide an opportunity to interconnect Carter Hill Road in Clinton with Route 145 in Westbrook via the Saddle Hill Reserve subdivision and the Deer Ridge subdivision application properties via a road built to modern standards. It is noted that the proposed Deer Ridge roadway layout shown on plans submitted to this office does not appear to provide for such an opportunity in this location, at least in the configuration envisioned in the previously-approved Saddle River Reserve subdivision in Clinton.

It should be noted that where it would seem to make sense to provide such east-west connectors in general, several specific factors may suggest that such a connection may not be as necessary in this location. Specifically, based upon the hearings for the neighboring Saddle Hill Reserve, that subdivision was approved despite the concern of abutting property owners for (among other issues) the potential for cut-through traffic to Route 145. In that the Westbrook Planning Commission has not commenced hearings for the proposed Deer Ridge subdivision, it is not clear how area residents may feel about such an east-west connector through the subject property. In addition, two connections between Route 145 in Westbrook and nearby rural roadways in Clinton exist less than a mile north and south of the proposed Deer Ridge outlet onto Route 145 (Breakneck Hill and Old Horse Hill/Chittenden Hill Roads). In that the two existing connectors are older roads, the Westbrook Planning Commission has indicated that those two roads are characterized by excessive grades.

Identification of Public Access Walkway

It is unclear from submitted plans whether or not public access signs are to be proposed for the walkway areas being proposed for the proposed open space and within the subdivision. Specifically, the Westbrook Planning Commission should consider requesting that small signs directing the public and showing the location of preferred off-street parking be placed in the area where the public access walkway interests the proposed roadway (Profile 22+00) and at the entrance to the 10 foot walkway easement located at the terminus of the cul-de-sac. It is understood that the Town was interested in the applicant providing an easement for public access along the municipal boundary and in the vicinity of proposed Lots 10, 11, 12 and 13. Such 10 foot easement is shown on submitted plans. Although this design would appear to allow for the kind of interconnection of public open space properties desired by the Town, the question is raised whether the public may be hesitant to proceed along what appears to be a private driveway. Perhaps a separate path which is surfaced with wood chips (at least for the first 100 feet or so) with a visual "entry" including the aforementioned public access sign would clarify that the public path continues over what appears to be private property. The physical separation of such a path from the driveways along their entire length of the proposed driveway (approximately 1200 feet) would clarify the public nature of the path for both path users AND the prospective owners of Lots 10, 11, 12 and 13. A split rail fence or similar barrier physically separating the two pathways may be appropriate as well, at least along the length of the driveway. If not already proposed, such improvements could be included as modifications of a subdivision approval.

Concern for Potential Non-Pedestrian Use of Open Space

It is our understanding that the area proposed for open space is sometimes used for off road vehicles including all-terrain vehicles (ATV's) and motorcycles. Concern has been raised over whether or not it would be appropriate to continue to allow access to such vehicles, should the subdivision be approved and the open space become public land. Although difficult to police, the Town may want to consider whether partial restriction or total prohibition of such vehicles may be warranted or even possible. If the Commission decides that such uses should be restricted or prohibited, perhaps the local police or constables could assist in suggesting alternatives that may achieve such a goal. Such advice should be acquired and submitted as a part of the record of a public hearing and included, if warranted, as modifications of an approval.

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: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.