

Heft Brook Estates Subdivision

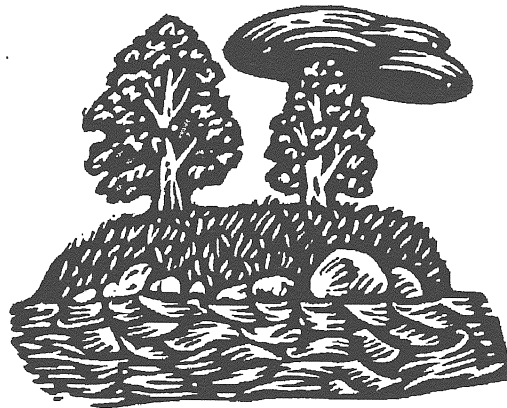
Killingworth, Connecticut

Eastern Connecticut
Environmental Review Team Report

Eastern Connecticut Resource Conservation and Development Area, Inc.

Heft Brook Estates Subdivision

Killingworth, 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
Planning and Zoning Commission
Killingworth, Connecticut**

October 2002

**CT Environmental Review Teams
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Acknowledgments

This report is an outgrowth of a request from the Killingworth Planning & Zoning 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 Thursday, August 15, 2002.

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I would also like to thank Charles Martens, chair, planning & zoning commission, Wayne Addy, chair, inland wetlands and watercourses commission, David Gumbart, chair, conservation commission, Jere Adametz, zoning, Maurice Woodworth and Michael Louran, Waldo & Woodworth, project engineers, Rich Snarski, project soil scientist, Peter Richards, Fred Jackson, adjacent property owners, Rob Sonnichsen, environmental consultant for the adjacent property owners, and Terry McDermott, area resident, 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 Killingworth Planning and Zoning Commission has requested assistance from the Eastern Connecticut Environmental Review Team in conducting a review of the proposed Heft Brook Subdivision.

The 61.5 acre site is located on Parker Hill Road in the northeast section of Killingworth. An eight (8) lot conservation subdivision is being proposed, two (2) lots will be accessed directly from Parker Hill Road and six (6) lots will be located on a new ≈1000 foot cul-de-sac road. All homes will be served by individual on-site sewage disposal systems and water supply wells. Two open space parcels (2.36 acres and 31.19 acres) are identified that total approximately 33 acres. Heft Brook, which runs north to south through the property, is contained in the larger open space parcel.

Objectives of the ERT Study

The commission is requesting the review to assist them in their evaluation of this proposed project. Specific concerns include water quality, wetland impacts, erosion and sediment control, stormwater management, potential off-site impacts to Murray Pond, impacts to aquatic and wildlife habitats and site design compatibility. The ERT report will provide a discussion of potential impacts, and guidelines and recommendations for the mitigation and protection of the natural resources.

The ERT Process

Through the efforts of the planning and zoning commission this environmental review and report was prepared for the Town of Killingworth.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the commission. 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 Thursday, August 15, 2002. 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.

Location Map

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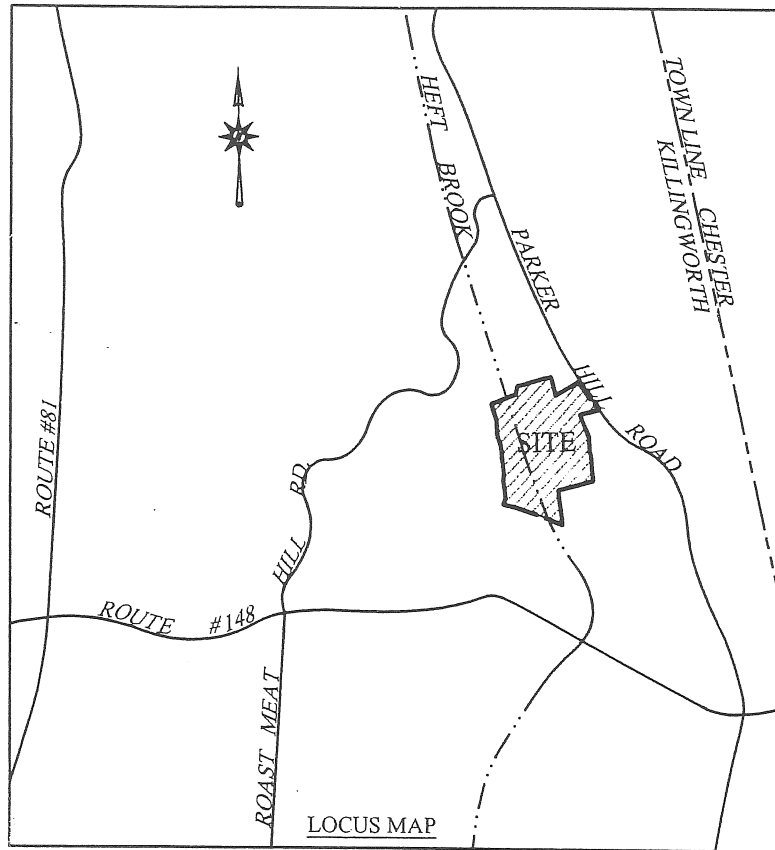


Figure 2.

Topographic Map

Scale 1" = 2000'

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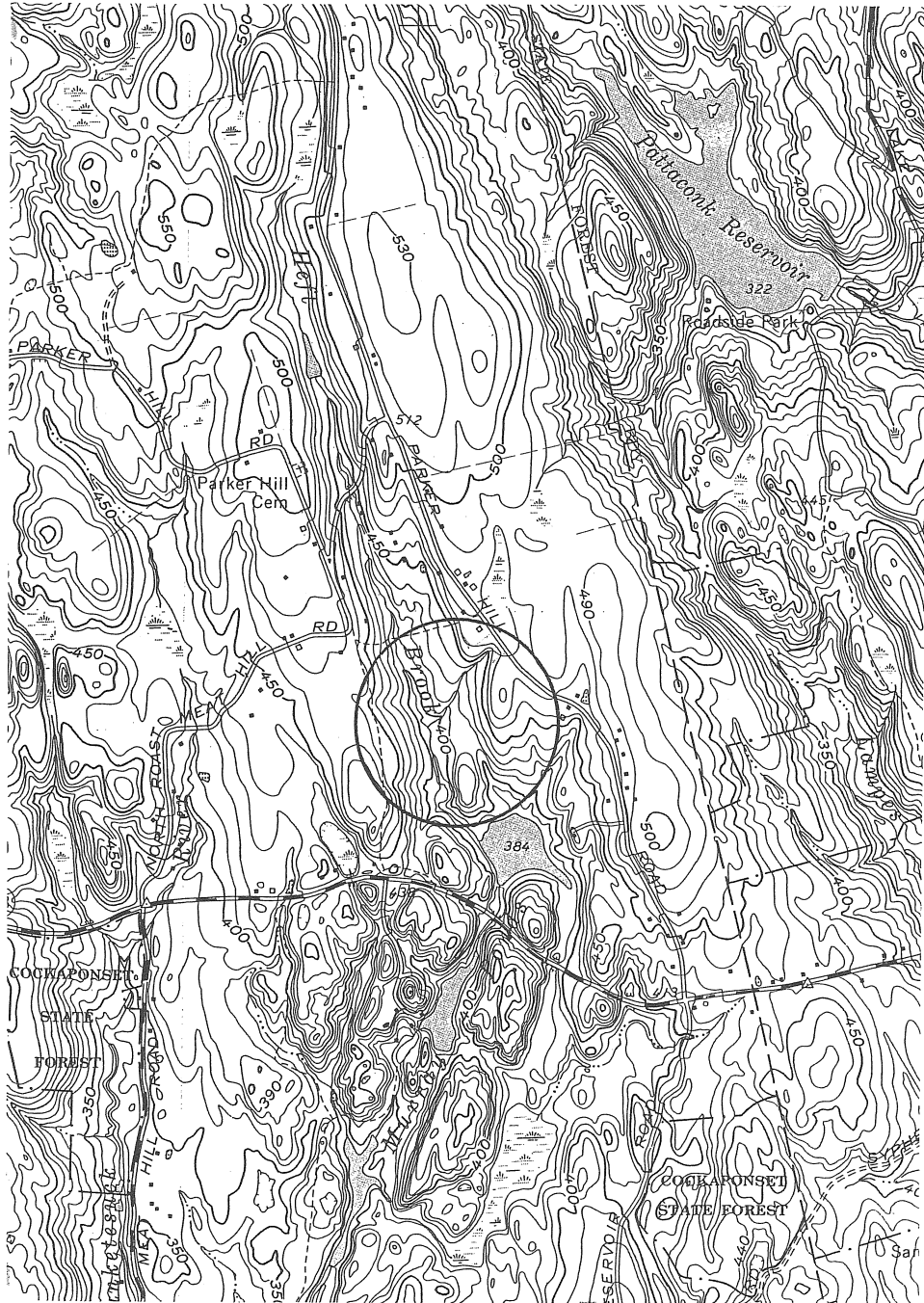
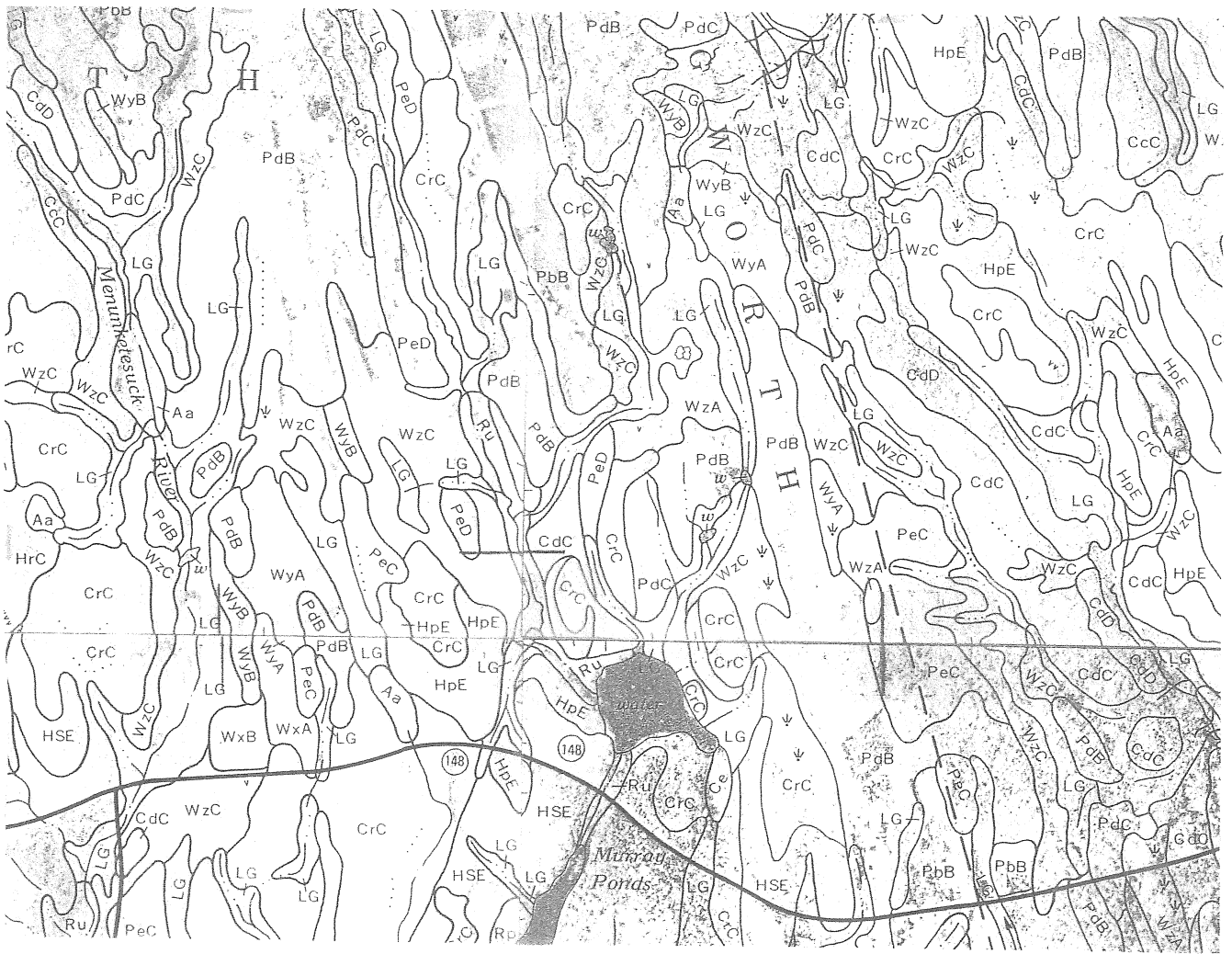


Figure 3.

Soils Map

Scale 1" = 1320'



Soils Resource Review

These comments based on review of available documents and the site visit.

- It would appear that stormwater management within the planned development could easily be accomplished without conduits and catch basins, but given this Team member's conversation with Town officials at the site, it is apparent that this is not an available option.
- It is also well understood that, once the development is completed, control of uses within and maintenance of land cover in wetland buffer zones is problematic at best. Particular attention should be given to an attempt to ensure that the protective functions of wetland buffers are maintained in perpetuity.
- See Appendix for Soils Report (Non-technical Descriptions and Limitations)

Stormwater Management

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 developer registers with the Department of Environmental Protection (CTDEP) and submits a Stormwater Pollution Control Plan (the "Plan" *at least* thirty days before the start of 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. To prevent this and to ensure adequate review time, the Department recommends early submittal of the Plan. The permit requires that the "Plan shall ensure and demonstrate compliance with the Connecticut Guidelines for Soil Erosion and Sediment Control (the "guidelines")". Also, the Plan must be flexible to account for adjustment of controls as necessary to meet field conditions. Please note that many erosion, sediment control, and stormwater detention issues must be dealt with on a local level before being included in the Plan.

The Plan must include a site map as described in Section 6(b)(6) of the permit and a copy of the erosion and sediment (E & S) control plan for the site. The E & S plan that has been approved by the Town in conjunction with the CTDEP Inland Water Resources Division (IWRD) and the local Soil and Water Conservation District may be included. The Plan must include a description of the E & S controls that will be used during each phase of construction, construction details for each control used, details of all outlet structures and velocity dissipation controls, and a description of procedures to maintain all erosion and sediment

control measures. Specific dewatering procedures must be addressed. Section 6(b)(6)(C)(ii) requires that dewatering wastewater be infiltrated into the ground unless otherwise approved by the commissioner in writing. The locations of all stockpiled materials must be shown along with necessary erosion control measures. The permit requires inspections by qualified personnel provided by the permittee at least once every seven calendar days and after every storm of 0.1 inches or greater. In addition, the Plan must include monthly inspections of stabilized areas for at least three *months following* stabilization. The Plan should note the qualifications of personnel doing the inspections and must allow for the inspector to require additional measures as necessary. All contractors and subcontractors must sign the contractor certification (Section 6(b)(6)(E)). The Plan must be maintained on site during construction and updated as necessary.

Erosion and Sediment Control Notes

Section 6(b)(6)(C)(i)(2) of the permit requires the installation of sediment traps or basins which will provide a minimum of 134 cubic yards of water storage per acre drained from a disturbed area during construction activities. This section further states that the installation of a sediment basin designed in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control is required for any discharge points that serve an area with more than 5 disturbed acres at one time. The Plan must indicate how this requirement will be met.

The developer should note that the use of temporary silt fence or a hay bale barrier at the detention basin outlet is not sufficient to convert a detention basin to a trap to provide sediment storage during construction. The Department recommends a fabric-wrapped perforated riser pipe and gravel cone, or an alternative outlet that conforms to the guidelines. Also, outlet structures from sedimentation basins must not encroach upon a wetland as stated in Section

6(b)(6)(C) of the general permit. As noted above, a detail of all outlet structures must be included in the plan.

Also, haybales and silt fence often do not provide adequate protection for catch basins during construction. The developer should review the need to provide additional sediment controls, particularly for the catch basin at the end of the cul-de-sac.

Post-construction Stormwater Treatment

Section 6(b)(6)(C)(iii) of the general permit contains three post-construction stormwater treatment requirements of which two apply to this project. Subsection 1 states that the Plan must include a design for treatment that achieves a goal of 80% removal of suspended solids from the stormwater discharges. The developer must address this requirement. Subsection 2 requires that velocity dissipation devices be placed at stormwater discharge locations and along the length of any outfall channel as necessary to provide non-erosive flow. The developer must provide justification that the rip rap pads at the outlets of the detention basin and the cul-de-sac catch basin will provide sufficient velocity dissipation to prevent erosion.

Conclusion

The plans provided for the ERT review must be expanded to incorporate all of the elements required by the permit prior to submittal to the CTDEP. This review does not constitute a complete review of the Plans for permitting purposes.

Wetland Resources Review

Site Overview

This development proposed for 61.5 acres of land in east central Killingworth. The proposal lies within the Heft Brook watershed and Heft Brook flows through the property on its way to a confluence with the Menunketesuck River, about 1.85 miles south of the site.

There are eight house lots proposed, all to be served by on-site wells and sewage disposal systems. Of the total 61.5 acres, 33.55 acres will be preserved as open space. This represents 55% of the parcel. The bulk of this open space is land adjacent to Heft Brook and west of the brook.

The parcel slopes from the 470 feet elevation on Lot 1 down to Heft Brook at an elevation of 390 feet, about 800 feet to the west. This drop in elevation represents a slope of 10%. This is typical of the slopes on this parcel, though some areas have a lesser slope and many areas have greater.

The parcel for the most part is wooded. The exception to this is the open fields towards the northern end of the site. The tree canopy often completely shades the ground. This limits the understory shrub layer and the herb layer to a thin, and sometimes nearly nonexistent presence.

Heft Brook is the most dominant wetland/watercourse on the property. It flows north to south through the property dividing it roughly 40 percent to the west, which is proposed as open space and 60 percent to the east which is where the proposed development will take place. Heft Brook was visited in the vicinity of wetland flag number ML243. Here the brook was eight to ten feet wide with a

black, flat rock and sandy bottom. The main channel was one to three feet wide, pooling in places to about ten inches in depth. It was in this vicinity that several small (juvenile) wood frogs were found. These were approximately one inch long in the sitting position and about one and a half inches long with legs extended. Frogs this size are new this year and still in the general vicinity (a few hundred feet) of their host pond. Wood frogs are an obligate vernal pool species.

National Wetland Inventory Clarification

The U.S. Fish and Wildlife Service has mapped and classified the wetlands and watercourses using a system of codes for all the topographic maps in the state. This parcel occurs on the Haddam quadrangle, 1:24,000 scale National Wetland Inventory (NWI) maps. Because of the scale of mapping, the inventory classifies wetlands that are the largest or most conclusively observed on the aerial photography.

At this location the single large wetland observed has been mapped as Palustrine wetlands, with palustrine being defined as: *of or pertaining to a swamp; marshy.*

The single palustrine classification on this property, Heft Brook, is classified as PFO1E. The description is as follows: palustrine (P), forested (FO), broad leafed deciduous (1), seasonally saturated (E). This classification applies to both Heft Brook and the finger of wetlands between lots six and seven.

Water Quality

The surface water quality (which includes the wetlands and watercourses) of the area surrounding the parcel have been mapped by the Department of Environmental Protection as being Class AA. Assumptions are made on many of the classifications over the extent of the map and not all surface water gets

quality tested. However, with no known sources of major pollutants upstream, the wetlands on the site can be assumed to have the water quality classification of AA.

The groundwater of entire area is classified as GAA which is the highest classification given in the state. As with the surface water, not all of this was field checked for the creation of the map but indications point to, and the result is mapped as, excellent water quality.

The water quality classifications as described in the: *Summary of the Water Quality Standards and Classifications (1977)* are as follows:

Inland surface water classifications

Class AA

Designated uses: existing or proposed drinking water supply, fish and wildlife habitat, recreational use (may be restricted,) agricultural and industrial supply. Discharge restricted to: discharges from public or private drinking water treatment systems, dredging and dewatering, emergency and clean water discharges.

Groundwater Classifications

Class GAA

In addition, the groundwater classification for the area is also GAA for the same reasons listed above.

Soils

The wetland soils on these parcels were delineated by Soil Scientist Richard Snarski. The wetland boundaries appear on the map(s) that the Team received

on the day of the field walk. Unfortunately, most of the flags in the field were not present at the time of the walk.

There are two wetland soils present on the property. Rippowam fine sandy loam (Alluvium and Flood Plain soils) underlie Heft Brook. Rippowam soils are described as: "Poorly drained. Surface runoff is slow. Permeability is moderate or moderately rapid in the upper loamy layers and rapid or very rapid in the underlying sandy materials. These soils typically flood in the spring of each year. Rippowam soils have a water table at or near the surface much of this year."

All other wetland soils are Leicester, Whitman, Ridgebury Very Stony Fine Sandy Loam complex shown as Lg on the map. This soil type is described as being "... being made up of poorly drained Leicester and Ridgebury soils and a very poorly drained Whitman soil. All of these soils are nearly level and very stony. They occur in similar patterns and they are similar enough in behavior that their separation is not important for the objectives of this survey . . . Forest covers most of the acreage but scattered areas have been cleared and are used for unimproved pasture . . ." in the County Soil Survey. Similar comments are made in USDA Soil Information and Data Page which can be found at:

<http://ortho.ftw.nrcs.usda.gov/osd/index.html>

The wetlands the Team visited on the field walk were all forested wetlands with a full overstory of trees and a mixed, often thin, understory of shrubs and herbs except for the isolated finger of wetlands in the northern reach of the property which was an open, wet meadow wetland.

Comments Regarding the Site

In all, the proposed plan does well to avoid impacts to wetlands. Killingworth wetlands regulations limit encroachment upon wetland soils to 100 feet from wetlands in this area of the town.

It is likely that most of the downhill drainage on this sloped site is not channeled but occurs as sheet flow downhill across the forest cover. Even the smaller intermittent stream courses dispersed into sheet flow upon encountering coarse woody debris perpendicular to their flowpath.

- Of the 61.5 total acres in this proposal 33.6 acres, or 55%, are proposed to be set aside for Conservation Easement. Of the remaining 27.9 acres, less than one acre will be used for roads, driveway and footprint of the houses combined.
- There is a double storm drain at the end of the cul-de-sac. It features a systematic removal of storm water downslope 300+ feet discharging onto a 10 by 10 foot rip rap pad. Without regular cleaning of the catch basins, sediment will bypass these units as collection devices and flow directly to the pad. In time, under these conditions, the pad will fill with sediments and then the sediment laden overrun will be carried directly into the wetland setback area. It is always a challenge for the Public Works to clean the catch basins, but the Conservation Commission and/or Wetland Commission could have a list of important areas to clean in the case of limited resources. This might be one of them in the future.
- It is a nice step to have the interior of the cul-de-sac vegetated for groundwater recharge and to decrease runoff. Taking this impervious surface concept to the limit includes creating a surface area that is concave to

keep water and snowmelt in place. Subsequent plantings would then be with plant species that can tolerate occasional times of inundation or “wet feet”.

- Just to the west of the of Lot 5, when the Team visited Heft Brook downslope from the reserve septic area on Lot five, the Team encountered many Wood frogs (*Rana sylvatica*). The Wood Frog is recognized as an Obligate vernal pool species by biologists. They were predominantly in the area of the riparian zone of the river, that is, within 100 feet of the river edge. One of the many wood frogs was captured, identified, shown to the rest of the Team members and released. The Wood frogs in this area were quite small - this initial one being about one inch long when sitting. As we moved slightly upslope from the Brook the other specimens were increasingly larger. The largest one observed was between 1 1/2 and 1 3/4 inches long when seated. The occurrence here was under a full canopy cover with no shrub layer and very little herb layer vegetation. The ground was covered with leaves.

Since Wood Frogs are an obligate vernal pool species, there must be a vernal pool in the general area. The size of the wood frogs indicates they are juveniles - four to six months old. As such, their range in this first season is not as extended as when they are adults. Klemens and Calhoun in their publication *Best Management Practices - Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States, 2002*, cite mean juvenile migration distances as 1550 feet from their host pool. Thus, by insinuation, somewhere within approximately three fifths of a mile from the location where the frogs were found is a vernal pool. Although we looked, no members of the Team were able to locate any pool or depression that had dried up. That leaves the question of where the vernal pool(s) is located, and this may be unanswerable until springtime when the pools reappear on the landscape.

- Further upstream, near Wetland Flag 150, were located several ponded areas in the Heft Brook floodplain. These appeared to be vernal in nature. Only further investigation will reveal if they are breeding pools. These were located in the area just to the west of Lot 7.

The town will have to make a decision about going forth with any approval of this proposal until they have a qualified springtime review of these areas. This review should locate the pools, label as breeding pools or not and decide upon acceptable impacts to the pool populations - and to decide if this is of concern to the town.

- The wet meadow wetland east of Lot 8 has been avoided with this proposal. The town may want to consider a plan for maintaining this area as wetland and keeping out invasive species. Possibly the local Scouts or garden clubs could work with the owner of Lot 8 along these lines.
- In the southeast corner of the property is a finger of wetland that drains the local relief into Murray Pond Number One. The wetland is situated about halfway between Lots 3 and 4. From the northernmost point of the wetland to the pond shore it is about 950 feet. The lake measures 9.1 acres in surface area size. The water quality as mapped by the DEP (same reference as cited above) is AA. This is the highest water quality rank available. One of the goals of this project should be to maintain the quality of this water body. Potential impacts are sediments from the basin that is proposed at the northern edge of the wetland and septage from the septic system at Lot 3 if there should be a failure of that system. Addressed individually, the stone berm on the downslope side of the basin should be a good sediment filter for outflows especially if there is some detention time to any water collected. Additionally, the failure of the septic system on Lot 3 would 1) be only temporary until it was repaired, and 2) based on the topographic information presented, any surface flow would be

directed almost due south. And, as mentioned above there is a distance of several hundred feet to the water's edge which is all vegetated. Certainly any runoff would be greatly modified and at least partially renovated before its entrance into the pond.

- More on vernal pools: Typically vernal pools are small, shallow, circular or oblong depressions in the landscape which 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 pools, making these areas attractive to certain animals that would normally fall prey to carnivorous fish.

The impacts the proposed development may have on the vernal pool wildlife assemblage could be significant. The amphibian life that use the pools as breeding grounds 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 could have a significant impact on the associated wetlands.

Migration distance vary significantly between species. Klemens and Calhoun show mean distances from the host pool for the spotted salamander at 386 feet, for the Jefferson salamander at 477 feet, juvenile wood frogs at 1550 and adult wood frogs with a maximum of 3835 feet.

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 that occur at the site in question. However, a record of red-shouldered hawk was reported in the April 12, 2002 letter from David Gumbart, Chairman of the Killingworth Conservation Commission (a copy of the letter follows). There will be a follow up with Mr. Gumbart to verify the record of the red-shouldered hawk.

According to the letter from Mr. Gumbart, a state listed species of special concern, red-shouldered hawk, was observed during a site visit to the property in April 2002. No information has been placed on file with the DEP at this time (8/6/02).

Red-shouldered hawks (*Buteo lineatus*) nest in early February - March in lowland wet tracts of woods, swamps, wooded river bottoms, even narrow strips of woods along creeks. They have a strong attachment to the nesting area and may return year after year. They catch and eat mice, chipmunks, rabbits, skunks and occasional birds. They winter over much of the nesting range.

The Wildlife Division has not made an on-site inspection of the project area nor been provided with details or a timetable of the work to be done. It is recommended that a survey be conducted in spring to determine where the species is nesting in relation to the proposed work.

Consultation with the Wildlife Division should not be substituted for site-specific surveys that may be required for environmental assessments.

Natural Diversity Data Base information includes all information regarding critical biological 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 substitutes 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.



KILLINGWORTH CONSERVATION COMMISSION
Town Office Building • 323 Route 81 • Killingworth, CT 06419-1298

April 12, 2002

Mr. Wayne Addy; Chairman
Inland Wetlands Commission
Town of Killingworth
323 Route 81
Killingworth, CT 06419

Dear Mr. Addy.

I am writing to you on behalf of the Conservation Commission of the Town of Killingworth, in regard to the application of (Heft Brook subdivision), located west of Parker Hill Road, and along Heft Brook. The purpose of this letter is to inform you of a conservation easement held by the Town of Killingworth over Murray Pond, on property immediately downstream of the proposed subdivision, and to express concerns the Conservation Commission has regarding the proposed subdivision.

The conservation easement was granted to the Town in 1986, in order to protect the conservation value of Murray Pond during the development of the Murray Pond Estates subdivision. It is recorded in the Town land records, in Volume 90, Page 299. According to easement language, the easement was requested by the Town Planning and Zoning Commission, which "determined that the maintenance and conservation of [Murray Pond] can best be accomplished by a Conservation Restriction in favor of the Town of Killingworth."

As such, the easement was put in place to "perpetually preserve, protect, limit, conserve and maintain the land...in its present natural, scenic, and open condition." The Conservation Commission is named as the acting agency on behalf of the Town. The restrictions placed over the pond (and, thus, on the three landowners with lots abutting the pond) include no dumping of materials; no excavation or dredging; no removal or destruction of natural vegetation or spraying of pesticides.

Having become aware of the proposed (Heft Brook subdivision) plans and the easement itself, the Conservation Commission has visited the pond and surrounding land, meeting with several neighbors whose property is encumbered by the easement. The following represents some of our observations and those of the neighbors we met with.

INLAND WETLANDS COMM.
RECEIVED 4/23/02 #6



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The pond itself remains free of algae in the summer time, suggesting a clean flow of water from Heft Brook and that current nutrient loading of the pond is negligible. Because Heft Brook flows into a public drinking supply reservoir owned by the Connecticut Water Company (south of route 148 and east of Reservoir Road), it may be worthwhile to seek the input of the Water Company in regard to any potential adverse affects of additional homes built adjacent to Heft Brook on its water supply.

During a site visit of 4/11/02, a red-shouldered hawk was observed. This is a state rare species, designated by the State Department of Environmental Protection as being of special concern, and is a confirmed nesting species in Killingworth. The definition of a special concern species is: "any native plant or nonharvested wildlife species documented by scientific research and inventory to have a naturally restricted range or habitat in the state, or to be at a low population level..."

The pond provides excellent habitat for nesting and migrating waterfowl; species observed (and reported by neighbors) include canada goose, mallard, american black duck, wood duck, common merganser, hooded merganser and ring-necked duck. Egrets, herons and kingfishers have also been spotted here.

Beaver are present, with a lodge visible at the western edge of the pond. Potential dams that could be built could alter upstream habitat by creating wider expanses of wetlands and open water. Native brook trout are present in Heft Brook, a species susceptible to water quality degradation. River otter have also been spotted in the pond.

Though subdivision property itself was not walked, surrounding habitat suggests the potential exists for vernal pools to be present on the property. These ephemeral water bodies are essential for the breeding success of a variety of frogs and salamanders, which spend the majority of their lives in upland habitat away from the pool. Alterations to this upland habitat can displace vernal pool organisms and degrade the pools themselves. If it is possible, a field visit to the site is recommended, whereby the presence of any vernal pools could be verified.

Enclosed with this letter are a series of photographs of the area, taken by neighbor Fred Jackson (used with his permission). In photos 1N and 1S (for north and south), an intermittent stream is shown, flowing from the proposed subdivision property over property of Peter Richards, whose land is encumbered by the easement. The presence of



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this intermittent stream suggests this narrow "finger" of land would be subject to surface water runoff from potential new home sites. Nutrient input into Murray Pond would be a concern with both septic systems and fertilizers associated with lawn care.

Photo 2N, looking onto proposed subdivision property, further illustrates the topography of this low elevation area. Photo 3S is taken from where Heft Brook enters Murray Pond, the natural resource protected by the conservation easement. Any erosion and sedimentation resulting from habitat alteration north of the pond could adversely affect the pond. This could include possible road or driveway crossings and clearing of vegetation in the building of house lots.

Photos 4N, 5N and 6N all show portions of Heft Brook, just north of Murray Pond, in its current natural state. It is the hope of the Conservation Commission that any activity proposed over, or near to Heft Brook be reviewed carefully, so as to avoid negative impacts to the wetland habitat here, particularly in view of the Town-held conservation easement over Murray Pond.

The Conservation Commission appreciates the willingness of the Inland Wetlands Commission to consider our comments regarding the (Heft Brook subdivision), and its potential impacts on the protected Murray Pond. If you or any other Wetlands Commission member have any questions or comments regarding this letter or the Murray Pond easement itself, we would be pleased to discuss this with the Wetlands Commission at its convenience.

Very truly yours,

David Gumbart, Chairman
Conservation Commission

Fisheries Resources

Fisheries Resources

Heft Brook, a tributary of the Menunketesuck River, runs through the property. Due to its small size, this stream type is often overlooked as far as its relative importance as an aquatic resource. However, this small perennial stream supports a viable coldwater fish community. Although the stream has not been sampled by the Inland Fisheries Division, it is known to support native brook trout. In 2001, a very large, 17 inches total length, native brook trout (non-hatchery reared) was documented in this watercourse by Inland Fisheries Division staff. This fish, captured downstream of the proposed subdivision near Route 148 was the largest native brook trout ever documented in Connecticut. Brook trout typically spawn in Connecticut during the month of October. Eggs incubate within gravel over the fall and winter periods with eggs hatching in late February or early March. Fry remain in the gravel until their yolk sacs are absorbed at which time the fry emerge from underneath the gravel and move into preferred stream microhabitats. The stream may also support other stream species such as blacknose dace, fallfish and white sucker.

Heft Brook, adjacent to the proposed subdivision is of low to moderate gradient. Common to many Connecticut streams, Heft Brook has overwidened through time being characterized by a high width-depth ratio. This condition creates very shallow water habitats during base flow conditions. Albeit variable, most mesohabitat is in the form of alternating stretches of riffle/run habitat. Shallow pool habitats are mostly located at meander bends. Deep pool and holding habitats for adult brook trout are limited. Streambed substrates are composed of small cobbles, small to large size gravels, and coarse sand. Pool habitats have accumulated coarse sands. Most coarse sands that are present in the stream

appear to have emanated through streambank erosion. The stream is well shaded with a very tight, closed overhead canopy.

The unnamed tributary to Heft Brook does not support year round fish populations. Although displayed on the USGS topographic map as a perennial stream, the stream was dry the day of the field review 9/4/2002 and appears to be more aptly defined as intermittent. The lower end of the stream, near its confluence with Heft Brook may seasonally support fish populations during higher stream flows. One of the more important functions of this stream is to provide clean and unpolluted waters to downstream areas of a watershed, which contain an increased diversity of aquatic organisms.

Surface water quality of both Heft Brook and the unnamed tributary to Heft Brook are classified by the Connecticut Department of Environmental Protection as Class AA. Designated uses of Class AA waters are as follows; existing or potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply and other purpose.

Potential Resource Impacts

Soil Erosion and Sedimentation

During housing and road construction topsoil within the parcel may become exposed and susceptible to runoff events, especially near steep slope areas. Surface topography from this parcel drains downslope into the unnamed tributary of Heft Brook and Heft Brook; thus, sediment runoff, if not properly controlled, could impact these aquatic resources. Erosion and sedimentation due to construction related activities have long been regarded as a major cause of aquatic habitat degradation. If sediment runoff does occur, the following damage to stream ecosystems could be expected: (1) Sediment reduces the survival of resident fish eggs and hinders the emergence of newly hatched fry. Adequate

water flow, free of excess sediment particles is required for fish egg respiration and successful hatching, (2) Sediment reduces the survival of aquatic macroinvertebrates. Since aquatic insects are important food items in fish diets, reduced insect populations levels in turn will adversely affect fish growth and survival, (3) Sediment reduces the amount of usable habitat required for spawning purposes. Excessive fines can clog and even cement gravels and other desirable substrates together, (4) Sediment reduces stream pool depth. Pools are invaluable stream components since they provide necessary cover, shelter, and resting areas for fish, and (5) Turbid waters impair gill functions of fish and normal feeding activities of fish.

Stormwater Drainage

Stormwaters that outlet to wetlands and watercourses can contain a variety of pollutants that are detrimental to aquatic organisms. Pollutants commonly found in stormwaters are hydrocarbons (gasoline and oil), herbicides, heavy metals, road salt, fine silts, and coarse sediment. Nutrients in stormwater runoff can fertilize stream waters causing water quality degradation. Additionally, some fine silts in stormwaters that remain in suspension for prolonged periods of time often cannot be effectively removed from roadway catch basins and/or stormwater detention basins. Accidentally spilled petroleum based chemicals or other toxicants can cause partial or complete fishkills if introduced in high concentrations.

Lawn Fertilizers and Chemicals

Runoff and leaching of nutrients from lawn fertilizers can stimulate aquatic weed and algal growth in riverine habitats and degrade ambient water quality conditions. Excessive applications of lawn insecticides and herbicides have been documented to cause "fish kills" and surface water quality degradation.

Recommendations/Comments

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

Riparian Corridor Protection

It is the policy of the CTDEP Inland Fisheries Division that riparian corridors be protected with a 100 ft. wide riparian buffer zone. A riparian wetland buffer is one of the most natural mitigation measures to protect the water quality and fisheries resources of watercourses. Most infrastructure development for this 8-lot conservation subdivision will occur outside of the 100 ft. wetland setback area with only a portion of Heft Brook Lane, a portion of driveways for Lots 7 and 8, and the stormwater detention basin, being constructed within the 100 ft. setback area. Thus, subdivision design and development is fairly consistent with CTDEP Inland Fisheries Division riparian corridor protection policy.

However, the Town of Killingworth may want to consider placing conservation restrictions along Heft Brook to minimize the future alteration of existing upland and adjacent floodplain wetland habitats. Otherwise, it's quite possible that some property owners may want to convert forested areas over to manicured turfgrass lawns. Also, the Town of Killingworth may want to consider the use of a common driveway entrance for Lots 7 and 8 to push the footprint of this access as far away from the wetland edge of the unnamed tributary of Heft Brook as is feasible.

Erosion and Sediment Control Plan

Proper installation and maintenance of erosion/sediment controls is critical to environmental well being. This includes such mitigative measures as filter fabric barrier fences, staked hay bales, and temporary sediment basins. With the proper precautions and maintenance, excessive erosion can be preventable. Land

disturbance and clearing should be kept to a minimum. Exposed unvegetated areas should be protected from storm events. The applicant and the local wetland enforcement officer should be responsible for checking this development on a periodic basis to ensure that all soil erosion and sediment controls are being maintained. In addition, the applicant should post a performance bond with the town to protect against possible soil erosion violations. Past siltation disturbances in Connecticut have occurred when individual contractors either improperly deployed mitigation devices or failed to maintain these devices on a regular basis.

Stormwater Management

The effective management of stormwaters and roadway runoff can be accomplished through proper design, location, and maintenance of stormwater detention and catch basins. Particular attention should be made to stormwater discharges that outlet to wetlands and watercourses to ensure that instream erosion is not accelerated. Maintenance is very critical. Catch basins should be regularly maintained to minimize eventual adverse impacts to aquatic resources. The use of sand and sodium chloride road salt to de-ice paved surfaces should be minimized.

Lawn Chemicals/Fertilizer

Property owners should consider having the soil in lawns tested to identify which nutrients are sufficiently abundant and which nutrients are not. This information tells you which nutrients you need and don't need to put on your lawn. Whenever possible, landowners should use fertilizers with little or no phosphorus. The use of low or non-phosphorous fertilizers can provide nutrients while avoiding threats to water quality. As previously mentioned, conversion of forested areas to lawns could be prevented thorough the use of a conservation restrictions along Heft Brook.

Instream Fish Habitat Improvements

Due to lack of deep pool habitat and diversity of instream cover for adult brook trout in Heft Brook, opportunities exist in this stretch of brook along the proposed subdivision to enhance instream fish habitats. If the Town of Killingworth the developer or private property owners along the brook are interested in exploring instream fish habitat enhancements, the Team's fisheries biologist is willing to further evaluate such opportunities in Heft Brook.

Enhancements are designed to emulate natural stream features and would likely involve adding features such as large woody debris, logs, and boulders.

Collectively, these features will create instream cover and variations in channel depths, flow patterns and increase the quality and availability of fish and aquatic macroinvertebrate habitats.

Planning Review

Description of the Property

Heft Brook Estates is an eight-lot conservation subdivision located off Parker Hill Road north of Route 80 near the Chester municipal border. The 61.5-acre site is characterized by a significant wetland belt and watercourse, Heft Brook, and hilly terrain with bedrock outcroppings and moderate to steep slopes. Heft Brook crosses the site from north to south. The applicant has submitted a Preliminary Conventional Subdivision Plan that establishes the eight lot count. Based upon that lot count, a second set of plans entitled Record Map of an Open Space Subdivision has been submitted. The Open Space Subdivision Map shows the eight proposed lots along with two open space parcels, one totaling 2.36 acres and the second totaling 31.19 acres. The larger of the two parcels includes Heft Brook and the majority of its bordering wetlands.

Comments

Submitted information suggests that environmental issues are of primary concern for the Heft Brook subdivision property. Specifically, concern exists over what impacts the proposed development may have on Heft Brook and its wetland system and, ultimately, Murray Pond further downstream. Issues raised include water quality, stormwater management, erosions and sediment control, wetland impacts, potential impacts to Murray Pond, aquatic habitat, wildlife habitat, and site design capability as well as the Connecticut Water Company's water supply to which Heft Brook eventually feeds. Comments regarding these issues are as follows:

Stormwater Runoff - Construction

It would appear that stormwater runoff would potentially be one of the most important considerations when discussing water quality of the nearby Heft Brook watercourse system. The applicant has provided a specific listing of Management Strategies which appear on the plan entitled "Site Details and Erosion and Sediment Control Narrative and Details". As long as the construction proceeds consistent with the management plan submitted with the application, it appears that every effort will have been made to minimize stormwater runoff impacts that may result during construction. As the Commission realizes, daily inspections of the silt fencing and hay bales is critical to the success of an erosion and sediment control plan. It is noted that the applicant indicates that daily inspection and inspection after "significant" rain events is proposed. In addition to such inspections, inadequate installation is also a primary cause of management plan failure. Such inadequate installation can take the form of improperly buried silt fence and poorly staked hay bales. As the Commission realizes, improperly installed erosion control measures can allow bypassing of the devices.

Stormwater Runoff - Post-Construction

The applicant has proposed the construction of two drainage basins - the larger one a detention basin, and the smaller a retention basin. As the Commission is likely aware, a detention basin is designed to detain stormwater so that it can metered out at a rate equal to or less than the rate of stormwater drainage that would occur on the site had the development not been built (i.e. zero rate of runoff increase). A retention basin, on the other hand, is designed to retain the stormwater, allowing it to sit and eventually evaporate without being released to another drainage system.

It appears that the primary drainage structure proposed for the site is the detention basin located adjacent to road mark 7+50. Based upon the overall design of the detention basin, it appears that the stormwater drainage system will

likely minimize impacts of stormwater to the Heft Brook system to the greatest extent possible, this assuming that the basin is sized properly. An especially important consideration with stormwater runoff is the extent of vegetated buffer that such stormwater will pass through prior to emptying into the nearby watercourse system. The applicant should be clear that vegetated buffers will remain in all areas downstream of the detention basin to the greatest extent possible.

Site Design/Septic System

For the most part, the locations of most of the proposed septic systems seem to be in areas that are sufficiently separated from the wetland and watercourse areas. Lots 4 and 5 are designed so that the proposed septic systems are nearest the sensitive resources. Due to the fact that the systems are best located down-gradient from the dwelling, it doesn't seem that their locations can be significantly moved toward the proposed structures and away from the wetlands to the west. Assuming the drainage gradient mirrors the surface gradient, it is noted that the western portion of Lots 4 and 5 seems to flatten somewhat between the septic system locations and the wetlands, presumably slowing the movement of effluent through the soils in the area. This presumed gradient condition would likely be more favorable to resource protection than if the gradient were steep and consistent.

Construction Impacts

Review of the submitted plans indicates that most construction will be sufficiently separated from the nearby wetlands resources, thereby minimizing potential impacts during the construction period. It is noted, however, that the proposed driveway for Lot 7 seems to be in close proximity to the small wetland belt that passes beneath Parker Hill Road and connects to Heft Brook further west. Although a silt fence is shown along the entire length of the proposed driveway, concern is raised with respect to whether or not a single silt fence will be sufficient where the driveway is proposed to pass within 15 feet of the mapped

wetland boundary. In addition, only a minimal vegetated buffer will exist adjacent to such driveway.

It is not clear whether Killingworth Subdivision Regulations allow for shared driveways, particularly where two adjacent lots do not have at least 150 of frontage on Parker Hill Road. If regulations (Section 7.4. 1(d)(1), Building Sites, Examples) require two separate driveways for Lots 7 and 8, perhaps the applicant could request a waiver of subdivision regulations so as to allow the combination of the two driveways with the resulting shared driveway being located as far from the wetland belt as practicable, presumably on Lot 8. An access easement in favor of Lot 7 should then be included with the subdivision application.

Conclusion

It seems that the proposed open space subdivision has been designed to minimize potential resource impacts to the greatest extent possible. As long as the construction personnel (1) follow the management strategies presented in submitted plans, (2) insure that erosion and sediment control measures are installed properly, inspected daily and repaired when necessary, and (3) retain vegetated buffers to the greatest extent practicable in areas down gradient from the detention basin and adjacent to the Lot 7/8 driveway, impacts to the nearby resources should be minimal. Relocation/combining of the driveway access for Lot 7 will also provide an added insurance against potential resource impacts.

Appendix

Please Contact the ERT Office at
860-345-3977 for Appendix Information

ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.

**The services of the Team are available as a public service
at no cost to Connecticut towns.**

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, landfills, commercial and industrial developments, sand and gravel excavations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Soil and Water Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.