KING'S MARK ENVIRONMENTAL REVIEW TEAM

REPORT FOR

HERITAGE WOODS

SOUTHBURY,
CONNECTICUT

King's Mark Resource Conservation and Development Area, Inc.

HERITAGE WOODS

SOUTHBURY, CONNECTICUT

Environmental Review Team Report

Prepared by the King's Mark Environmental Review Team
of the King's Mark Resource Conservation
and Development Area, Inc.

Wallingford, Connecticut

for the

Southbury Inland Wetlands Agency

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the Inland Wetlands Agency and the Town. The results of the Team action are oriented toward the development of a better environmental quality and long-term economics of the land use. The opinions contained herein are those of the individual Team members and do not necessarily represent the views of any regulatory agency with which they may be employed.

JUNE 1990

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team Coordinator, Nancy Ferlow, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this study:

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I would also like to thank Susan Anderson, Secretary of the King's Mark Environmental Review Team for assisting in the completion of this report.

Finally, special thanks to Mark Cooper, Beatrice Collins, Debbie Haray, Paul Palmer, Nelson Caye and Coleman Lee of the Southbury Inland Wetlands Agency, Curtis Jones, Heritage Development Corporation, Mark Lancor, DYMAR Technical Services and Philip Barske, ecological consultant, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The Southbury Inland Wetlands Agency has requested an environmental review of Heritage Woods, a 94.6-acre site proposed for residential development. The site contains second growth mixed forest with several areas of steep slopes. A large wetland system is found in the central portion of the site. There is an existing erosion problem concerning 6 eroded, intermittent watercourses which drain the wetlands and flow toward Transylvania Brook.

The developer proposes a cluster development, including 150 single-family units, for the site. The remainder of the site will be left as open space. The site will be served by municipal water and sewer. Several roads will serve the development, crossing the wetlands in 6 places and the gullies in 10 places. The developer plans to stabilize portions of the gullies with riprap. Stormwater will be discharged directly to the wetlands and watercourses. A berm is proposed to convert an existing wetland to a wet marsh.

The review process consisted of 4 phases: (1) inventory of the site's natural resources; (2) assessment of these resources; (3) identification of resource problem areas; and (4) presentation of planning and land use guidelines. Based on the review process, specific resources, areas of concern, development limitations and development opportunities were identified.

Location, Zoning and Land Use

The site is located north of South Britain. It is bounded by Route 172, Southbury Training School, Heritage Village and private, wooded land. The site is zoned R-30A with a maximum density of 175 units. The vicinity is characterized by residential uses and some agricultural land. Over the years there has been a decrease in farmland and an increase in forested land and residences.

Proposed Project

The proposed development consists of 150 single-family detached dwellings on 94.6 acres and approximately 6,530 linear feet of paved road. Each home will be served by water and sewer mains supplied by the Heritage Village Water Company and Heritage Water Company Treatment Plant, respectively.

Topography

The site is located southwest of East Hill and north of Rattlesnake Hill. Site elevations range from approximately 170 feet above mean sea level near Route 172 to 450 feet above mean sea level at the northeast corner. The majority of the slopes on the site are moderately steep, but there are some areas of gentle slopes and very steep slopes.

Geology

The bedrock underlying the site has been mapped as New Haven Arkose, a red, fine- to coarse-grained arkosic sandstone with lenses of conglomerate. The maps indicate that there are 2 inactive faults on the site. The bedrock is covered by glacial till and stratified drift. Texture of the till ranges from sandy and loose to stony and compact (hardpan). Hardpan soils are usually associated with a seasonally high watertable condition which is an important design constraint for keeping basements dry and stabilizing slopes. Stratified drift deposits are very thick near Route 172. Regulated wetland soils have been mapped for the site. The primary limitations of wetland soils are wetness, frequent flooding and low development potential. All work in wetlands requires a permit from the Inland Wetlands Agency.

Geologic Development Concerns

The development will be served by water and sewer lines tied into the Heritage Village system. The applicant should demonstrate that there is adequate capacity in both systems to accommodate the proposed development. Development constraints include steep slopes, hardpan soils, seep areas and regulated wetland soils. The development plan generally avoids the steep slopes, but some cuts for roads and driveways will be needed. Deep cuts in hardpan soils are difficult to stabilize. Soil slopes should not exceed 2:1. Seasonally high watertables and seeps will require drainage to keep basements dry. Water collected should be included in the stormwater management system. The developer has made an effort to keep houses outside of a 50-foot wetland buffer, but several houses are constructed over topographic swales which may carry water. Steep slopes and till soils with a high silt content are susceptible to erosion. A proper E&S plan should be implemented. There are several wetland crossings planned. Although undesirable, wetland crossings are feasible, provided they are properly designed.

Hydrology

The entire site lies in the Transylvania Brook watershed and represents approximately 2% of the total watershed area. Surface waters on the site have not been classified by the DEP and are presumed to be Class A. Transylvania Brook is Class B/A and is known or inferred to be degraded. The State's goal is to upgrade the water quality. Groundwater on the site is Class GA.

Development on the site will increase the amount of runoff. All runoff should be handled by a stormwater management system. Because the post-development peak discharges are insignificant and because of the site's proximity to Transylvania Brook, there are no control structures planned. The only proposed improvement is the replacement of 4 culverts under Route 172. There is a documented flooding problem where Transylvania Brook crosses Spruce Brook Road. Despite the opinion that this problem will occur regardless of the proposed development, runoff increases from the site will further aggravate the problem. This should be addressed by the Town and the developer. The deep gullies already present on the site underscore the need for proper E&S control measures. Small storms are important in designing erosion controls for streambanks.

Soil Resources

The soils in the eastern portion of the site are derived from glacial till. Soils at the base of the hill are derived from stratified drift. The major soil limitations are steep, highly erodible slopes and wetness from perched watertables.

Erosion and Sediment Control

The E&S control plan for the development is basically adequate. Comments include evaluating the effectiveness of the plunge pools, locating diversions at the top of the cut or fill slopes, placing lime and fertilizer schedules on the plans, specifying the size of the stone in swales, leaving no more than 20 feet of utility ditch exposed at one time, clarifying the phasing of the development and providing provisions for capture of road sands, oil and grease.

Wetland Considerations

The wetlands found on-site are mixed hardwood swamps with pockets of emergent marsh. Wetland functions include water collection and wildlife habitat. It is unclear in the developer's report whether DEP Bulletin #9 was used to identify wetland functions or the consultant conducted his own analysis. If the DEP method was used, every wetland in the watershed must be analyzed to compare values. The numbers presented in the report indicate that the DEP method was not used, but this should be clarified. Numerous watercourses transverse the site and have erosion problems. The measures detailed in the E&S plan must be strictly followed to minimize the problems. A "wetland enhancement" was recommended for a wet marsh area. This wetland is functioning well at the moment, and enhancement is unnecessary.

Approximately 0.51 acres of wetlands will be altered, primarily through road construction. Alterations to the watercourses include piping, riprap and plunge pools. Many of these impacts could be reduced through an alternative configuration, but alternatives may be limited due to slope and resource constraints. There has been an effort to concentrate development outside of the wetlands. Primary intrusions will be road crossings. Secondary impacts should also be addressed. Deed restrictions should be considered to prevent homeowners from intruding the wetlands. E&S control is extremely important. Regular inspections should be conducted. Clearing for units should be limited to allow a naturally landscaped appearance.

Wildlife Considerations

Habitat on the site includes hardwood forests, wetlands, early successional stage and 6 streams. The area offers a variety of food and cover to wildlife, including deer, grouse, weasel, raccoon, fox, coyote, various birds, reptiles and amphibians. The forested areas provide cover, nesting, roosting and denning sites. Early successional areas and wetland areas provide diversity, travel paths and edges needed by many species. The site offers good habitat.

As with any development, the impact on wildlife habitat will be negative. Habitat will be broken-up and lost with the construction of roads, driveways, walkways, parking areas and homes. Other impacts include the creation of lawns and the presence of humans, traffic, dogs and cats. Certain species will disappear, and others will increase. Wetland use by wildlife can be preserved by the use of a 100-foot buffer. Excavating plunge pools in wetlands is not prefered because wetlands will be altered with development and will continue to be affected with maintenance equipment. Maintaining good water quality is important, and all precautions should be taken to protect the quality of the water entering the wetlands.

Islands of open space will least benefit wildlife. Open space areas should be connected by natural travelways. There are many measures which can make the area more suitable for wildlife, including providing buffer strips, using natural landscaping techniques, excavating detention basins outside of wetlands, providing proper E&S controls, using bridges instead of culverts, using deed restrictions to protect the remaining wetlands and maintaining forest wildlife requirements.

Threatened and Endangered Plant and Animal Species

According to the DEP - Natural Diversity Database there are no Federally listed Endangered Species or Connecticut "Species of Special Concern"on the site. A Proposed State Threatened Species, Swamp Cottonwood, is located south of the site.

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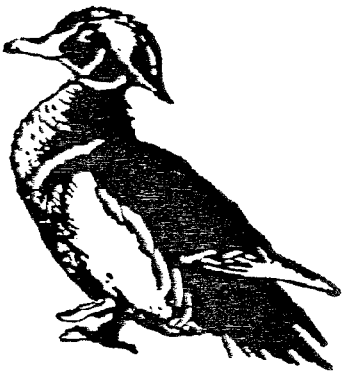


INTRODUCTION

The Southbury Inland Wetlands Agency has requested an environmental review of Heritage Woods, a 94.6-acre site proposed for residential development. The developer owns 2 additional parcels adjacent to the site, but development plans for these parcels are unavailable. The site is located in central Southbury near South Britain. Access is provided by Route 172.

The site contains second growth mixed forest with several areas of steep slopes. A large wetland system is found in the central portion of the site. There is an existing erosion problem concerning 6 eroded, intermittent watercourses which drain the wetlands and flow toward Transylvania Brook. A Connecticut Light and Power Company (CL&P) power line easement runs through the site.

The developer proposes a cluster development, including 150 single-family units, for the site. The remainder of the site will be left as open space. The site will be served by municipal water and sewer. Several roads will serve the development, crossing the wetlands in 6 places and the gullies in 10 places. The developer plans to stabilize portions of the gullies with riprap. Stormwater will be discharged directly to the wetlands and watercourses. A berm is proposed to convert an existing wetland to a wet marsh.

The primary goal of this ERT is to inventory the natural resources of the site and provide land use information. Specific objectives include:

1) Assess the hydrological and geological characteristics of the site, including geological development limitations and opportunities;

2) Determine the suitability of existing soils to support the proposed development;

3) Discuss soil erosion and sedimentation concerns;

4) Discuss water quality concerns, including stormwater management;

5) Assess the impact of the development on the wetlands, including alternatives for consideration; and

6) Assess the impact of the development on wildlife, including alternatives for consideration.

THE ERT PROCESS

Through the efforts of the Southbury Inland Wetlands Agency, the developer's representatives and the King's Mark ERT, this environmental review and report was prepared for the Town. This report primarily provides a description of on-site natural resources and presents land use guidelines. The review process consisted of 4 phases:

1) Inventory of the site's natural resources (collection of data);

2) Assessment of these resources (analysis of data);

3) Identification of resource problem areas; and

4) Presentation of planning and land use guidelines.

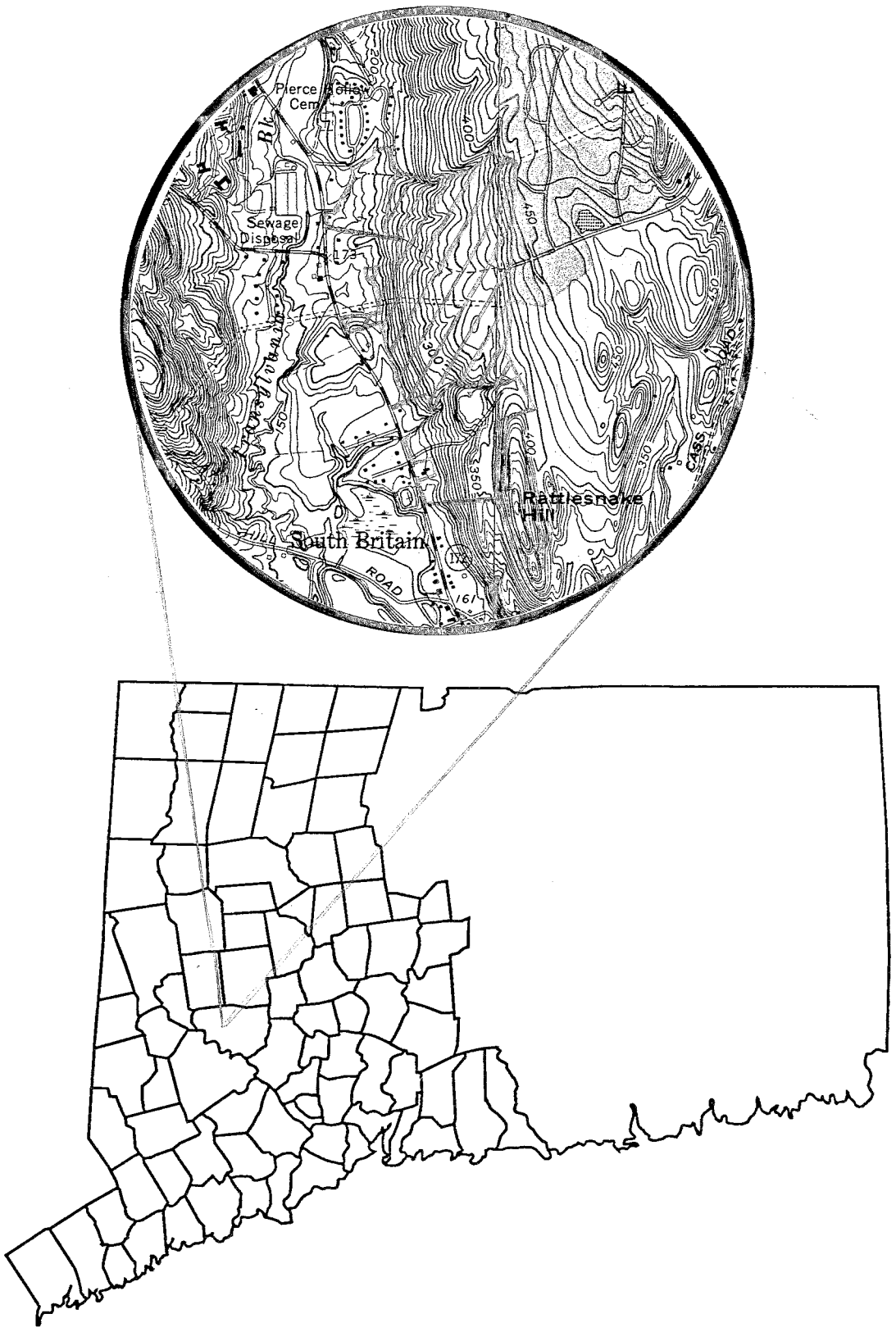
The data collection phase involved both literature and field research. The ERT field review took place on May 24, 1990. Field review and inspection of the proposed development site proved to be a most valuable component of this phase. The emphasis of the field review was on the exchange of ideas, concerns or alternatives. Mapped data or technical reports were also perused, and specific information concerning the site was collected. Being on-site also allowed Team members to check and confirm mapped information and identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. The results of this analysis enabled the Team members to arrive at an informed assessment of the site's natural resource development opportunities and limitations. Individual Team members then

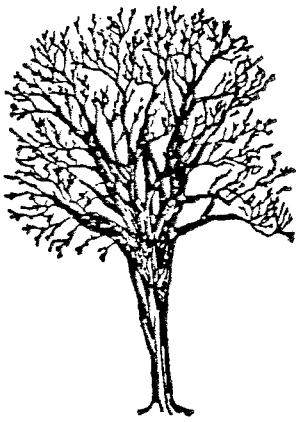
prepared and submitted their reports to the ERT Coordinator for compilation into the final ERT report.

Figure 1

LOCATION OF STUDY SITE



PHYSICAL CHARACTERISTICS



LOCATION, ZONING AND LAND USE

The site, known as parcel 1A, contains 94.6 acres and is located north of the South Britain section of Southbury. The site abuts Route 172 on the west, Southbury Training School on the north, Heritage Village (a high density condominium development) on the east and wooded, undeveloped land on the south. The developer owns 2 additional parcels, known as 1B and 2, located south and northwest of the site, respectively. Development plans for these parcels are unavailable. Route 172 will provide access into and out of the site via a boulevard that extends approximately 850 feet eastward from Route 172 on parcel 1B. An emergency access road will connect to East Hill Road on the east.

Based on a 1988 superior court ruling, the site is zoned entirely as R-30A and has a maximum density of 175 units, subject to receiving federal, state and local permits.

The site and vicinity are characterized mainly by residential land, including a high density condominium development (Heritage Village) and low density single-family homes. Agricultural land, consisting of open fields and the Southbury Training School also occur in the area. A review of air photos of the site and vicinity indicates land use changes over the past 56 years include a decrease in farmed land, an increase in forested land and an increase in residential properties. The 1934 photo indicates that the western half of the site and some interior parts once comprised open pasture land, but are presently wooded. A CL&P easement, consisting of overhead electrical utility lines, parallels a segment of the northeast corner boundary for a distance of 2,000 feet and bisects the central parts in an east-west direction for a distance of approximately 1,500 feet. The easement is managed by the CL&P to prevent tree growth and provide access for maintenance workers.

PROPOSED PROJECT

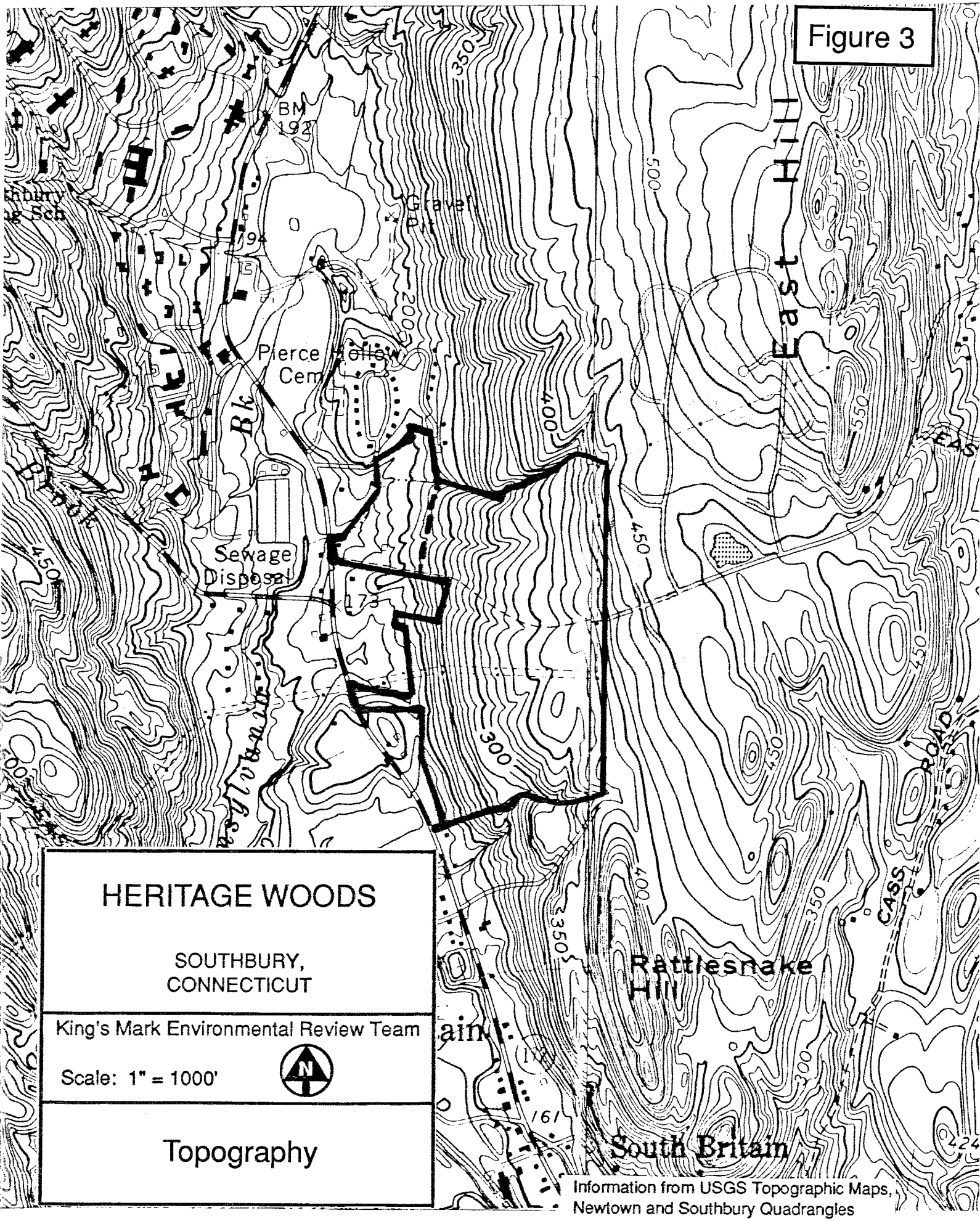
The proposed development consists of 150 single-family detached dwellings on 94.6 acres and approximately 6,530 linear feet of paved road. The development will be organized under a homeowner's association.

Each home will be served by water and sewer mains supplied by the Heritage Village Water Company and Heritage Water Company Treatment Plant, respectively. The proposed development roads will cross wetlands in 6 places. Also, deeply incised gullies that occur in several areas on the site will be crossed in 10 places.

Approximately 2.3% of the regulated wetlands on the site and the 14.6-acre parcel known as 1B will be disturbed for road crossings, drainage envelope, wetland enhancement and/or utility crossings.

TOPOGRAPHY

The site is located southwest of East Hill and north of Rattlesnake Hill in central Southbury. Site elevations range from approximately 170 feet above mean sea level near Route 172 to 450 feet above mean sea level at the northeast corner. The majority of the slopes on the site are moderately steep, but there are some areas of gentle slopes and very steep slopes (see Figure 3). Very steep slopes occur at the western limits, and gentle slopes occur in the southeast corner. At least 6 west flowing streamcourses have deeply incised the land surface of the site and, in places, have exposed the underlying bedrock. These streambanks are very steep in places.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Information from USGS Topographic Maps, Newtown and Southbury Quadrangles

GEOLOGY

Except for a narrow strip at the eastern limits, the site is encompassed by the Newtown topographic quadrangle. The strip at the eastern limits of the site is located in the Southbury topographic quadrangle. Bedrock geologic maps have been published for these quadrangles, including Map QR-33 (Bedrock Geology of the Newtown Quadrangle by Rolfe S. Stanley, 1976) and Map QR-30 (Bedrock Geology of the Southbury Quadrangle by Robert B. Scott, 1974). Both maps were published by the Connecticut Geological and Natural History Survey. Surficial geologic maps for the quadrangles have not been published to date, but there is surficial geologic information available for both quadrangles at the Department of Environmental Protection (DEP) Natural Resources Center in Hartford. Other information referenced includes the Bedrock Geological Map of Connecticut (John Rodgers, 1985), the Soil Survey of New Haven County, Connecticut (1979) and the unpublished Surficial Materials Map of Connecticut (Janet Stone, et. al., 1985).

Bedrock Geology

The site occurs on the western edge of the Pomperaug Valley, an outlier to and miniature version of Connecticut's Central Valley. The rocks in these valleys consist of a "layer cake" of sedimentary rocks and igneous rocks.

A sedimentary rock unit, known as New Haven Arkose, underlies the site (see Figure 4). Sedimentary rocks are composed of bits and pieces of older rocks that were eroded from one area, transported to and re-deposited in anther area and then cemented together. The New Haven Arkose, which is exposed in places within the deeply incised gullies on the site, consists of red, fine- to coarse-grained arkosic sandstone with beds and lenses of conglomerate. Arkose refers to a red to brown, medium- to coarse-grained, sandstone-like sedimentary rock that contains quartz, feldspar and rock fragments. These rocks were deposited into the Pomperaug basin

during the Triassic geologic period approximately 220 million years ago. Generally speaking, the rock strata in the New Haven Arkose on the site dip moderately eastward.

The bedrock geologic maps for the site indicate the presence of 2 northeast/southwest trending faults that traverse the site. They occur at the northern and southern limits of the site. The upper 150-200 feet of bedrock is probably considerably fractured close to the fault zones. These faults are not currently active.

Surficial Geology

The unconsolidated materials overlying bedrock on the site consist of the glacial sediments, till and stratified drift (see Figure 5). Except for the area west of the 200-foot contour, the site is covered by glacial till. Till consists of an unstratified, unsorted mixture of silty, coarse to fine sand, including varying amounts of boulders. These materials were transported and deposited directly by glacial ice as it advanced through the region.

Although the texture of the till varies, it is generally sandy, stony and relatively loose in the upper 2-3 feet or in shallow to bedrock areas, but it may become siltier and more compact with depth. The site contains both varieties of till. According to soil mapping data, an area of sandy, loose till occurs in the central parts. The eastern half of the site is dominated by till which is characterized by extreme stoniness and a compact soil zone approximately 1.5-2 feet below ground surface. This compact soil zone (hardpan) is composed largely of fine-grained sediments (i.e., silt, clay and fine sand). The presence of a hardpan layer usually results in a seasonally high watertable condition. Also, some areas of very wet seeps were observed in this area during the field review. Seeps and seasonal high watertable conditions are important design constraints for keeping basements dry and for slope stabilization where deep cuts occur. Although the thickness of the till is variable, it

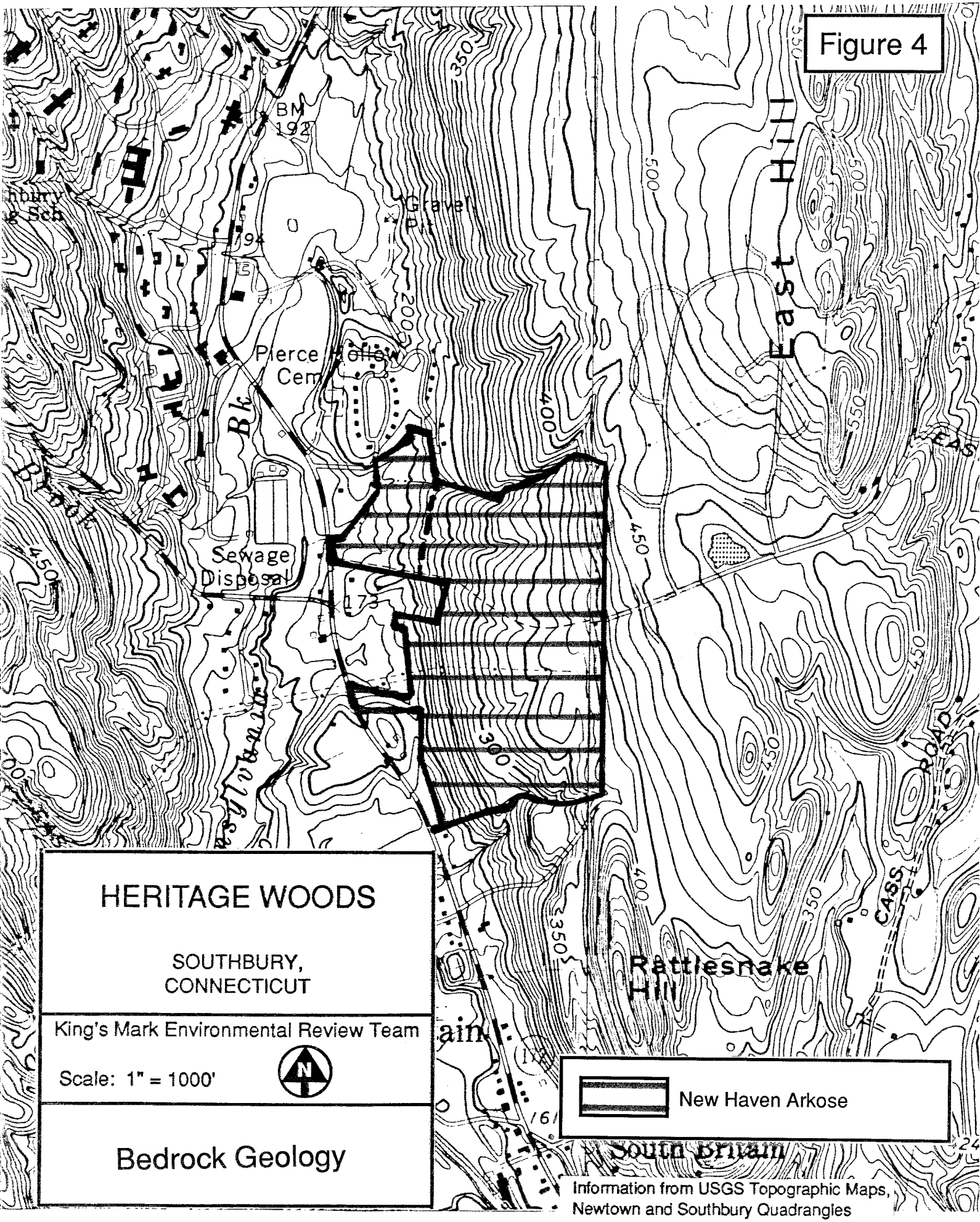
Figure 4
BM 192
Gravel Pit
Pierce Hollow Cem
Bk
Brook
Sewage Disposal
East Hill
Rattlesnake Hill
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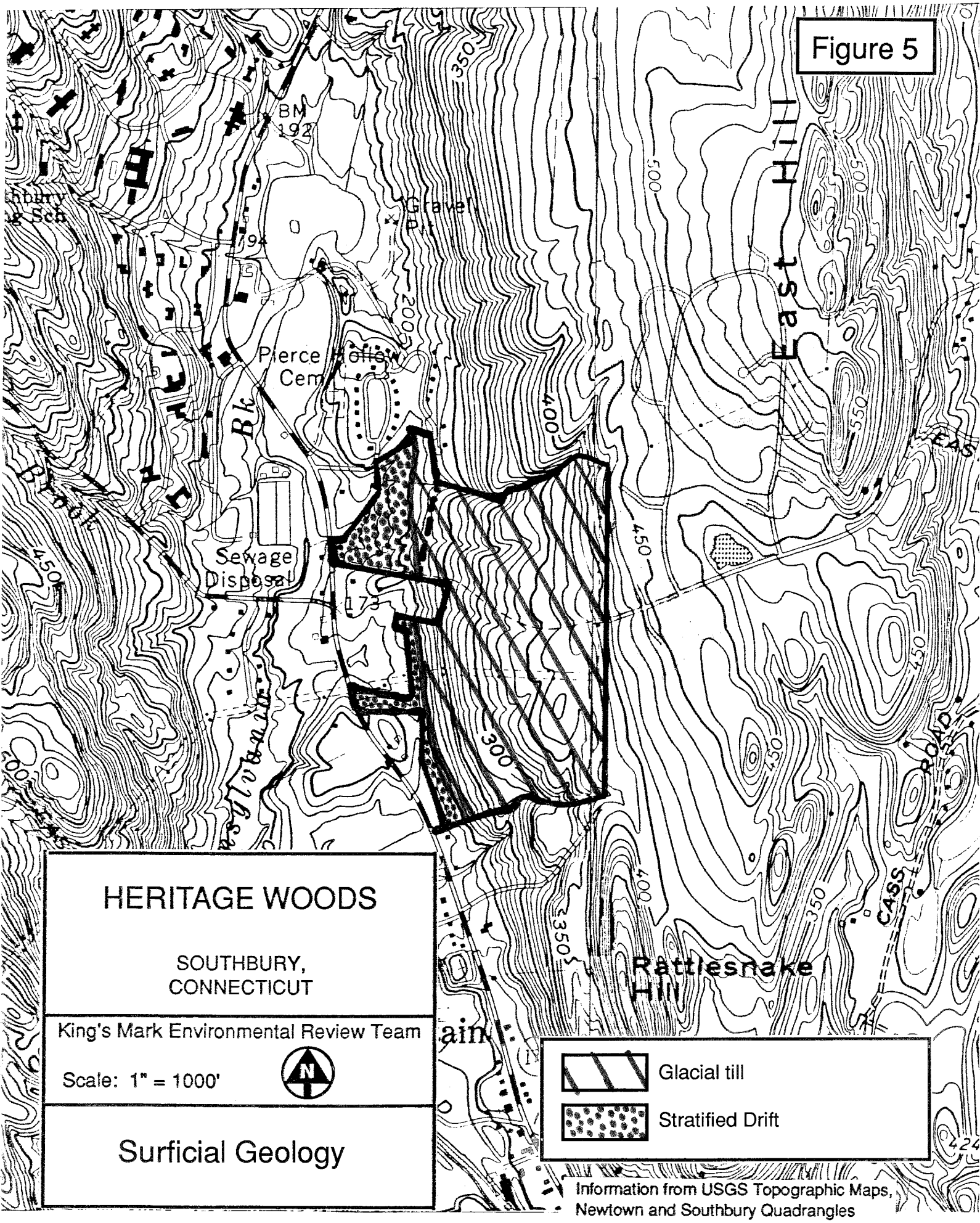
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BM 192
Gravel Pit
Pierce Hollow
Cem
Bk
Sewage Disposal
East Hill
Rattlesnake Hill
CASS
ROAD
Glacial till
Stratified Drift
HERITAGE WOODS
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Surficial Geology
Information from USGS Topographic Maps, Newtown and Southbury Quadrangles

probably is generally greater than 10 feet in the areas proposed for development (see Geologic Development Concerns).

The western limits of the site (west of the 200-foot contour) consist of sand and gravel deposits (stratified drift) that were laid down by meltwater streams adjacent to a stagnant tongue of ice occupying Transylvania Brook Valley. Theses deposits are very thick near Route 172. The log of a well west of the proposed entrance to the site showed 122 feet of sand, fine sand and gravel overlying bedrock.

The applicant's soil scientist has mapped the regulated wetland soils on the site. It is estimated that 16.1 acres of parcels 1A and 1B comprise regulated wetland soils. According to the Hydrology and Soil Survey Plan, the principal regulated soils found on the site are of Ridgebury, Leicester and Whitman extremely stony fine sandy loams. These wetland soils parallel the 6 streamcourses which flow across the site to Transylvania Brook and occur as medium to large sized wetland pockets in the eastern half of the site. This undifferentiated soil unit comprises very deep, loamy soils that formed in glacial till. The Ridgebury and Whitman soils developed in compact till, while the Leicester soils developed in more friable till. They range from poorly drained (Leicester and Ridgebury) to very poorly drained (Whitman). In general, the Leicester and Ridgebury soils are nearly level to gently sloping soils in drainageways and low-lying positions of till-covered uplands. The Whitman soils occur on nearly level to gently sloping depressions and drainageways on till-covered uplands. From an engineering standpoint, the major limitation of these soils is the seasonally high watertable (wetness). A high watertable condition is at or near ground surface in the Leicester and Ridgebury soils generally between November and May. A high watertable condition is at or above ground surface in the Whitman soils September through June. According to present plans, these regulated wetland soils will be affected (i.e., filled, modified and/or disturbed) by:

1) Road construction and accompanying grading;

2) Soil erosion and sedimentation during construction; and

3) Construction of stormwater discharge points.

Other regulated wetland soils found on the site include a pocket of Saco silt loam (Sc) located in the eastern parts (Wetland Area C4) and Raypol silt loam (Rb) located in the northwest corner (Wetland Area F).

The Saco soils consist of nearly level very poorly drained soils that typically occur on low flood plains of major streams, but may be found in topographical depressions subject to sedimentation. According to the applicant's certified soil scientist, the Saco soil has a "topsoil layer that ranges from 20 to 40 inches or more in thickness and consists of very dark gray to black silt loam and very fine sandy loam. The surface may also have inclusions of muck on top less than 12 inches thick. The underlying subsoil and substratum also consists of silt loam, but may have inclusions of fine sandy loam to loamy sand, especially below 36 inches." The Saco soil has a high watertable at or near the surface most of the year and is subject to frequent flooding. It has low potential for development and should be avoided. A berm is proposed near the outlet (southern end) of this wetland pocket. The purpose of the berm is to turn the existing wetland into a wet marsh. A visual inspection of this area during the field review revealed a viable, well-functioning wetland and the construction of the berm is unnecessary.

The Raypol soils which occur on parcel 1B are described by the applicant's certified soil scientist as "poorly drained silty soil on floodplain or depressions. The topsoil consists of 20 to 40 inches or more of dark brown to grayish brown silt loam or very fine sandy loam. Below 40 inches, the soil material is highly variable in color and textures. Permeability is moderate." According to the Soil Survey for New Haven County the Raypol soils have a seasonal high watertable at a depth of

approximately 8 inches from fall until late spring. Additionally, they may be flooded or ponded for periods of several days each year. These soils also hold low potential for development and should be avoided. Present plans indicate that the southern end of the Raypol soils will be filled by the construction of the entrance boulevard (see Geologic Development Concerns).

For parcels 1A and 1B, it is estimated that 0.51 acres or 3.2% of the regulated wetlands will be affected by the proposed development. This work will require a permit and ultimate approval by the Inland Wetlands Agency.

GEOLOGIC DEVELOPMENT CONCERNS

The proposed development will be served by public water and sewers tied into the Heritage Village water and sewer systems. The applicant should demonstrate to the Town that there is adequate capacity in both utility lines to accommodate the proposed units. Extension of the utilities to the site will allay the principal hydrogeologic limitations for the installation of on-site septic systems such as a seasonal high watertable condition, surface seeps, slow percolation rates and steep slopes. Despite the availability of public water and sewer lines, the presence of moderately steep to very steep slopes, hardpan soils that are characterized by seasonally high watertables, seep areas and regulated wetland soils warrant careful examination.

The proposed development plan generally avoids placing buildings on the steepest slopes which principally occur in the western parts. For the most part, roadways have been designed to cross slopes and conform to the contours rather than run perpendicular to steep slopes. This will reduce the amount of cuts and fills necessary to construct segments of the road and driveways and limit the amount of

disturbance from grading. However, there are places where road/driveway cuts will be necessary on the hillside.

Deep cuts or excavation in hardpan soils, which occur in the eastern parts of the site, are extremely difficult to stabilize due to the seepage of groundwater over the restrictive layer approximately 1.5-2.5 feet below ground surface. This water may create an unstable condition just below the seepage line. The weight of the unstable soil causes the soil to flow downslope. Once this begins, the slope is very difficult to stabilize. The establishment of a good vegetative cover is practically impossible on these eroding slopes. Besides the unsightly condition, the eroded soil must be removed from the base of the slope. Soil slopes usually cannot exceed 2:1 (horizontal:vertical).

The potential for seasonally high watertables and wet seeps in the eastern parts of the site suggests that building footing drains should be installed for all homes to minimize the potential for wet basements. Subsurface water collected in building footing drains and roof gutters should be included in the stormwater management plan. All drains must be properly outletted to prevent drainage problems to neighboring units or properties. The developer has made a conscientious effort to keep houses outside of the 50-foot wetland buffer. However, in the northcentral and southeast corner of the site, the construction of homes over topographic swales that convey at least seasonal water flows presents a potentially high risk for water-related problems to proposed homes.

Moderately steep to very steep slopes and till soils which may contain a high silt, fine sand and/or clay content make the soil, especially in the eastern parts, susceptible to erosion. Proper erosion and sediment (E&S) control measures must be implemented. These measures should minimize adverse environmental impacts to wetlands or watercourses on- and off-site due to erosion and sedimentation.

Development plans indicate that the road network will cross or encroach wetlands/gullies in several areas. Although undesirable, wetland crossings are feasible, provided they are properly engineered. Roads must constructed adequately above the surface elevation of the wetland to permit better drainage of the road and decrease the frost heaving potential. Road bed preparation should include removal of all organic material before the fill material is placed. In cut areas, underdrains should be installed on both sides of the road. Road construction through wetlands should be done during the dry time of the year and should include provisions for effective E&S control. Culverts should be properly sized and located to prevent altering the water levels in the wetland and flooding.

All wetland impacts require a permit and ultimate approval by the Inland Wetland Agency. In reviewing the proposal, Agency members must determine the impact that the proposed activity will have on the wetlands. If Agency members find that the wetland is serving an important hydrological or ecological function and that the impact of the proposed activity will be significant, they may deny the activity altogether, or at least require measures that would minimize the impact. All prudent and feasible alternatives should be carefully investigated and considered by the applicant and the Town. The Inland Wetland Agency and appropriate staff should arrange to meet with the applicant and technical staff to view areas where alterations to wetlands are proposed.

HYDROLOGY

The entire site lies within the Transylvania Brook watershed area. From its point of outflow to Pomperaug River, Transylvania Brook drains an area of 7.51 square miles or approximately 4,800 acres. The site represents approximately 2% of the total watershed area.

Surface runoff originating on the site flows generally downslope toward discharge points such as the 6 seasonal streamcourses that flow in an easterly direction through the site and/or wetland areas. Water that reaches the streamcourses is piped under Route 172 and routed to Transylvania Brook. The applicant's engineer has divided the pre-development site into 4 subwatershed areas which are designated as J, K, L and M on the maps. The culverts that pipes water from each subwatershed under Route 172 and ultimately to Transylvania Brook are also shown. These reference points are represented by the letters G, H, M and J, respectively. Each of the 4 culverts under Route 172 will be replaced by larger pipes to pass post-development runoff from each subwatershed area. The pipes will be designed to pass up to the 50-year storm event as prescribed by ConnDOT.

According to the Water Quality Classification Map of Connecticut (Murphy, 1987), the surface waters on the site have not been classified by the DEP and are considered Class A water resources by default. Class A water resources are suitable for drinking water, recreational or other uses and may be subject to absolute restrictions on discharges, although certain discharges may be allowed. All watercourses discharge to Transylvania Brook, a Class B/A water resource. Class B/A water resources are known or inferred to be degraded in water quality and are generally suitable for recreational, agricultural or certain industrial uses such as process or cooling water. The State's goal is to improve, through Best Management Practices (BMPs), the water quality of Transylvania Brook to Class A. Groundwater within the study area is classified as GA which means it is suitable for private drinking water supplies without treatment.

Development of the site as planned will increase the amount of runoff for each subwatershed area during periods of rainfall. These increases will arise mainly from soil compaction, removal of vegetation and placement of impervious surfaces (i.e., rooftops, driveways, etc.) over permeable soils. Also, groundwater intercepted

in cut areas and collected by building footing drains should be accounted for and properly handled in the runoff management system. This system should be used to regulate the rate and amount of runoff and sediment from the development site during and after construction and to minimize undesirable effects such as flooding, erosion and sedimentation.

Because of the site's proximity to Transylvania Brook and because the calculated post-development peak discharges for the 10-, 25- and 50-year storm frequencies along Transylvania Brook are insignificant, no on-site control structures such as detention basins are proposed. The only proposed improvement is the replacement of the 4 culverts that drain each subwatershed area for the site. The new pipes will be designed for the 50-year storm event. However, there is a documented flooding problem where Transylvania Brook crosses Spruce Brook Road. Despite the applicant's engineer's opinion that the flooding problems will consistently occur in this area regardless of any improvements made on the Heritage Woods site, post-development runoff increases from the proposed development will further aggravate the existing problem. Therefore, this problem should be addressed by the developer and the Town. Possible improvements (i.e., culvert enlargement and maintenance measures) could be employed to alleviate the flooding problem in this area.

The presence of deeply incised gullies on the site underscores the necessity for proper streambank erosion control measures. Small storms (1- to 2-year frequency, 24 hour duration type III distribution storms) are most important in designing for streambank erosion control. Keeping the post-development 2-year frequency storm within the streambanks is normally not sufficient to prevent downstream bank erosion, since the 2-year flood itself can be an erosive condition. All stormwater discharge points should terminate outside of wetlands and watercourses and be designed to reduce flow velocities and minimize soil erosion at the discharge point. This can be achieved by a properly designed energy dissipater. Failure to address

this concern may lead to accelerated undercutting of streambanks in places, especially where the stream has eroded down to the bedrock surface. Because the bedrock is resistant, the stream will be forced into the sidebanks.

SOIL RESOURCES

The soils map generated by Soils Consulting Service of Southbury should be used for evaluation of the site due to the greater mapping intensity. Wetland soil boundaries were flagged in the field. Upland soil boundaries are based on the Soil Survey of New Haven County with more detailed adjustments for slope.

Soils in the upper eastern portion of the site consist of glacial till derived soils, including the well-drained Paxton, moderately well-drained Woodbridge, and the poorly and very poorly drained Ridgebury, Leicester and Whitman. Midslope are the deeper, well-drained and steeply sloping Charlton fine sandy loams. At the base of the hillside, along Route 172, the soils are formed in sandy and gravelly glacial outwash and stratified drift deposits. A soils table which outlines the various soil map units found on the site and their limitations for the proposed uses is included in Appendix A. The major limitations to development of the site are the steep highly erodible slopes and the wetness problems posed by perched watertables in the glacial till soils.

EROSION AND SEDIMENT CONTROL

In 1983 Public Act No. 83-388, "An Act Concerning Soil Erosion and Sediment Control" was passed to "reduce the danger from storm water runoff, minimize nonpoint source sediment pollution from land being developed and conserve and protect the land, water, air and other environmental resources of the state." Under

this law, most applications for development must have a comprehensive E&S control plan, including a map and narrative. Although the proposed development has an E&S control plan, these additional comments should be considered:

1) An evaluation of the effectiveness of the proposed plunge pools in preventing additional erosion from occurring downslope due to increased velocities and volumes of flows discharged from the proposed storm drainage system is needed.

2) There is potential for the boulders placed in channels (p. 3-9 of narrative, #1) to induce scouring of channel side slopes.

3) In item #3 on p. 3-9, diversions should be located at the top of cut or fill slopes to intercept runoff flows before they pass down over the slopes and to convey these flows to stable outlets.

4) The lime and fertilizer specifications on the plans should also be included in the seeding specification section of the narrative.

5) The rock swale detail is included on recently revised detail sheet 10/12. The size of the stone to be placed in the swale should be specified.

6) When installing underground utility lines, no more than 20 feet of ditch should be left exposed for an extended period of time.

7) The first statement in C of sheet 5/12 should be clarified for a better understanding of the timing of the various phases of the development and the sequence of construction for each of these phases. For example, if Sequence 1 of all phases is done at once, then the intent of phasing a development to minimize disturbed area is not realized.

8) Provisions for capture of road sands, oil and grease from the proposed development should be provided along with a schedule of maintenance for planned measures.

BIOLOGICAL RESOURCES

WETLAND CONSIDERATIONS

General Site Conditions

East Hill is a drumlin upon which the land slopes steeply on the western half, with a network of wetlands occurring at the higher elevations where the slopes become gentler. Numerous intermittent and permanent watercourses convey runoff from the site into Transylvania Brook located on the west side of Route 172. The water then drains into the Pomperaug River. Many of the watercourses have severely eroded banks, resulting in several major gullies. While the site is primarily forested, shrub dominated, grassed and shallow marsh areas are interspersed. The CL&P easement is periodically mowed, allowing for a good composite growth of grasses and shrubs.

Wetland Description and Functions

The wetland soils on the site have been mapped as the poorly drained and very poorly drained Ridgebury, Whitman and Leicester extremely stony fine sandy loams, 0-5% slopes (Rn); the poorly drained Raypol silt loam, 0-3% slopes (Rb); and the very poorly drained Saco silt loam, 0-2% slopes (Sc). For a complete description of the soil characteristics, refer to the Soils Consulting Service report prepared by Henry T. Moeller, Soil Scientist, dated December 6, 1989.

The majority of the wetlands on the site are mixed hardwood forested swamp systems displaying the typically associated vegetation (i.e., red maple, tussock sedge, spicebush, skunk cabbage and several species of ferns). The pockets of emergent marshes are characterized by common vegetation such as cattails, reed canary grass and tussock sedge.

The wetlands on the site function primarily as collection areas for upland runoff, including the many seep areas located on the easterly portion of the site.

These seep areas play a significant role in replenishing the water supply to the wetlands and provide a source of water for wildlife.

The second major function of the wetlands on the site is wildlife habitat. The combination of upland (especially the power line easement) and wetland areas along with the many intermittent and permanent streams facilitates the utilization of this site by a variety of wildlife species (i.e., small mammals, various amphibians and reptiles, nesting birds and larger mammals such as deer). The vertical stratification in the forested wetland systems (i.e., vegetative growth on several layers: canopy, understory, shrub story and ground) adds to the habitat value of the wetlands by increasing shelter, feeding and nesting opportunities. Forested wetlands are important to wildlife because they offer a stable habitat. In times of drought, surface water may be obtained in wetlands. In times of windy winter cold, wetlands provide windless refuges, producing seeds and fruits that may be consumed as food. Additionally, forested wetlands are often warmer than more open areas because of the close proximity of unfrozen and often flowing surface water and springs, combined with the windbreaking ability of the trees. Thus wetlands offer insurance for survival to animals in times of climatic extremes.

The report entitled Development Plan Proposal and Environmental Assessment Report (DYMAR Technical Services Corp., February 9, 1990) makes several references to DEP Bulletin #9 - "Method for the Evaluation of Inland Wetlands in Connecticut." It is unclear by reading the report whether the DEP methods of evaluation for the various functions were conducted, or if the author simply referenced the listed functions from that manual and conducted an analysis of his own. In any case, to use the DEP evaluation method accurately, every wetland within a single watershed must be analyzed. The numerical values are then compared, and a relative importance value is established. To use the DEP method to evaluate wetlands on a parcel without examining the entire watershed is

inappropriate, and the numbers are meaningless. The numbers presented in Table 2 "Qualitative Analysis of Wetland Functions" indicate that the DEP method was not used. Nevertheless, this uncertainty should be resolved.

There are numerous watercourses that flow off of the hillside into Transylvania Brook. The banks of several of these watercourses are severely eroded and undercut, resulting in a tremendous sediment problem in Transylvania Brook. The most significant concern regarding the proposed development is that the erosion problems already present will be aggravated by construction activities and the increase in runoff resulting from the creation of impervious surfaces. The measures detailed in the Sediment and Erosion Control Plan should be strictly adhered to, and extreme caution during the early construction phases of development should minimize the potential for problems.

The consultant has recommend "wetland enhancement" in the marsh area located near the eastern portion of the site. This wetland enhancement consists of installing a leaky dike to back up water into the marsh, creating a more open water habitat. This wetland is functioning well under the conditions in which it exists, and enhancement is unnecessary in this case. While the introduction of an open waterbody may attract waterfowl, the wetland is stable and undisturbed, and there is no reason to modify it.

Project Impacts and Regulated Areas

Approximately 0.51 acres of the 16.1 acres of wetlands on the site are to be altered, primarily through the construction of the roadway. There will be 6 major wetland crossings and numerous crossings of the watercourses by roads, leaving the bulk of the wetlands untouched. The major crossings along the eastern border will employ seepage envelopes, designed to maintain the flow into the wetlands. There are also some secondary fringe impacts along the road corridor. Major alterations to the watercourses include the result of piping, the placement of riprap and the

installation of plunge pools. Many of these impacts can be reduced or eliminated by a reconfiguration of the roadway and the reduction of the number of units. However, given the slope and natural resource constraints of the site, alternative designs may be limited. Nevertheless, the applicant is required to investigate alternatives (Section 7.1.4.d of the Southbury Inland Wetland Regulations) to the proposed activities so that Agency members may determine that no feasible and prudent alternatives exist. A feasible and prudent alternative in this case may be reducing the number of units to minimize wetland crossings. For example, Units 105, 106 and 107 could be removed, eliminating 3 watercourse crossings. Or a combined driveway could be utilized to eliminate 2 of the crossings.

Although a court decision has dictated that the Planning and Zoning Commission allow a maximum of 175 units, the Inland Wetlands Agency, a resource protection agency, is not necessarily bound by that planning decision. If the wetlands and watercourses on the site can be further protected by an alternative design, then the applicant should be directed to provide such alternatives.

General Comments and Recommendations

The applicant has made an effort to concentrate development activities outside of the wetlands on the site. Although the primary intrusions (i.e., the road crossings) have been mitigated somewhat by the use of seepage envelopes, secondary impacts should also be addressed. For example, homeowners frequently intrude wetlands to expand their lawn and/or add an accessory structure. Deed restrictions should be placed on individual units to prevent this from occurring. Also, the wetlands and undeveloped uplands should be deeded as open space.

E&S control is a primary consideration. Too often, the plans and specifications appear to be adequate, but are not followed by the contractor. Regular inspections (weekly or bi-weekly) of the site should be conducted to insure that the E&S control plan is implemented effectively. Clearing for units should be limited in scope to

allow for a more naturally landscaped appearance instead of the "cleared and planted" look.

WILDLIFE CONSIDERATIONS

Description of Area/Habitats

The 94.6-acre site contains a variety of habitats, including hardwood forest, wetlands, early successional stage habitat and 6 streams, 4 of which are intermittent. The site contains gently sloping to steeply sloping land.

Wildlife habitat is the complex of vegetative and physical characteristics that provide for all the requirements of wildlife, including shelter, resting, nesting and escape cover, water and space. Generally, the greater the habitat diversity and degree of interspersion of various habitat types, the greater the variety of wildlife there is using an area. Because of the variety of habitats on the site and the degree of mixing of these habitat types, the area provides good wildlife habitat. The wetlands on the site increase its value for wildlife.

A wide variety of wildlife species utilize the site to serve all their needs, while many other species find it a place to meet some requirements. These species include deer, ruffed grouse, weasel, raccoon, fox, coyote, hawks, owls, catbirds, sparrows, juncos, chickadees, reptiles and amphibians. A detailed description of the vegetation/wildlife habitat found on the site is contained in the report entitled Development Plan Proposal & Environmental Assessment Report, (DYMAR Technical Services Corp., February 9, 1990).

Forestland: A major portion of the site is covered by mixed hardwood forest containing various hardwood species and some small stands of hemlock, white pine and red cedar. Hardwood species include American beech, sugar and red maple, black and yellow birch, white ash, shagbark hickory, ironwood, tulip poplar and

various oaks. In some areas, especially in the deciduous wetland areas and areas that were more recently open, there is a fairly thick understory consisting of species such as spicebush, dogwoods, viburnums, birch, witch hazel and maple. These areas provide adequate cover and food for various birds and mammals.

Forests provide many things to wildlife. Softwood stands provide important year-round cover for species such as turkey, grouse and songbirds. Stands of hemlocks are preferred nesting sites for some species, including the veery and junco. The winged seeds produced by the hemlock are readily sought by red squirrel, pine siskin and chickadees. Oak trees provide a source of acorns or mast for a variety of species. Beech and hickory trees provide nuts. Larger diameter sized trees generally produce more mast and are typically more valuable to wildlife. Birch trees provide catkins and seeds which are used by ruffed grouse, chickadees, pine siskins and tree sparrows. Deer browse on the twigs. Snag trees (dead trees) are a source of insects which serve as food for many species such as woodpeckers and chickadees. Den trees (trees with cavities) can serve as a nesting or denning place for animals such as squirrels and raccoons.

Power Line Easement: The power line easement that runs through the site is maintained in early successional stage vegetation by CL&P. This area contains a variety of vegetation, including grasses, herbs, shrubs and saplings. Wetland vegetation predominates in wetland areas under the power lines. Because of the great variety of vegetation, this area offers good food and cover to a variety of species adapted to utilize early successional stage vegetation. Many songbirds, including the catbird, cardinal and hooded warbler, utilize this type of habitat for nesting and feeding. Seed and berry production tends to be high in these areas. Many species of small mammals such as mice and voles use grassy herbaceous growth areas. Also, because insect production is higher in grassy/herbaceous openings, these areas are attractive to birds and mammals that feed on insects.

The power line easement not only increases the overall diversity of the site, but also increases the "edge" or "edge effect." Edge effect is the phenomena that occurs where vegetational types meet with a high degree of interspersion, vegetational diversity or richness is achieved, and the needs of a wide variety of wildlife species are met.

Wetlands: Because wetlands increase the habitat diversity of an area and offer a variety of food and cover to wildlife, they are important areas to consider for protection. Acre for acre, wetlands and their associated riparian zones exceed all other land types in wildlife productivity. In addition to their value as wildlife habitat, wetlands serve other valuable functions, including water recharge, sediment filtering, flood storage, etc. For these reasons, the development of, filling in and/or crossing of wetlands should be avoided or limited whenever possible.

The majority of the wetlands on the site are deciduous or forested type wetlands. There is an area of shrub/scrub habitat under and to the north and south of the power line easement (noted in the DYMAR Technical Services Corp. report as C-3 and C-4).

The deciduous tree/shrub wetlands found on the site offer some variety of vegetation and are useful to a variety of wildlife species, including songbirds, mammals, reptiles and amphibians. Wetlands with seasonally standing water are important places for amphibian and reptile reproduction and are useful to many other species. Wetlands with a year-round supply of standing water are more diverse and are even more beneficial to wildlife in general. All wetlands benefit some wildlife.

The shrub/scrub wetlands (C-3 and C-4) found under and on both sides of the power lines offer a greater vegetational diversity and appear as though they contain some standing water year-round. These wetland areas are important for a variety of

species, because they provide a great diversity of vegetation which offers a variety of food and cover.

The deciduous type wetlands found on the site offer less vegetation diversity in general, but still provide wildlife habitat for an array of species. Although the evaluation for these types of wetlands may not be as "high" as for some other types of wetlands (i.e., marsh or emergent type habitat), they are still wetlands and are a sensitive areas important to wildlife. Because they are often viewed as "less valuable," allowances are sometimes made that impact on these wetlands. Many times these areas are used to build ponds in, construct detention/retention basins in, etc., resulting in a net loss of wildlife habitat and degradation of remaining habitat. Refer to the DYMAR Technical Services Corp. report for more wetland details.

There are 6 badly eroded watercourses on the site, 4 of which are intermittent. These badly eroded gullies offer little wildlife habitat. Some reptiles and amphibians might use these areas during the spring and fall when the gullies have more water in them. The 2 watercourses noted as Watercourse #1 and Watercourse #6 are less gullied and eroded and support vegetation in some places. These watercourses are more valuable to wildlife.

Wildlife Habitat/Recommendations

As with any development, the impact on wildlife habitat will be negative. The impact at this site will probably be fairly extensive, because of the density of the development, addition of roads and numerous wetland crossings. Large portions of the site will be broken-up in the construction of homes, parking garages, roads, parking lots and walkways. Habitat will be lost where cover is cleared for lawns and landscaping. Another impact is the increased human presence, vehicular traffic and a number of free roaming dogs and cats. This could drive the less tolerant species from the site, even in areas where there has been no physical change. The

value of the site for wildlife habitat correspondingly decreases as the amount of development on the site increases.

Certain species which are adaptable to man's activities may increase due to his presence, and associated nuisances may occur. Typical species which can become a nuisance include pigeons, starlings and raccoons. Species sensitive to man's presence or the changes made at the site will either move away or perish. Deer will probably be a common occurrence in the area and in the backyards of future residents. New residents should understand that successfully growing gardens or certain ornamental shrubs will probably require repellents which have only limited effectiveness, and fencing, which can be unsightly.

Wetlands: Because of the importance of wetlands to wildlife and because wetlands are limited in quantity and continue to dwindle on an almost daily basis in the State of Connecticut, it is always preferable to chose the option or path of development that least impacts wetlands. The value of wetlands increases as the quantity of the resource diminishes. A buffer of at least 100 feet is recommended around any wetland to preserve its value to wildlife. Activities such as pasturing animals in a wetland or filling them in for extra lawn and/or garden should be restricted.

It is never preferable to excavate plunge pools, silt basins, etc. in wetlands because this results in a net loss of wetlands, represents a long-term change/disturbance to the wetlands and can alter wetland vegetation by the fluctuating water levels caused and by the addition of sand, salts and oils from the roads and fertilizers from lawns. Also, silt basins require cleaning out or regular maintenance and must be accessible by equipment. If basins are excavated in wetlands, the wetland vegetation and soils will be disturbed each time equipment is brought in to clean out the basins.

Berms should not be constructed within wetland areas. This represents a long-term permanent change to the wetlands. No matter how well the silt basins work to settle out sediments, some will end up in the wetlands and settle out behind the berms. Since this cannot be cleaned out without greatly disturbing the wetlands, it presents a real problem. If possible, all silt basins, berms and riprap channels should be located outside of the vegetated wetlands.

Maintaining good water quality in wetlands is important for people as well as wildlife. Silts and oils from runoff can smother invertebrate life forms, thereby effecting the food chain in the wetland. A more readily observable effect of siltation is the change in vegetation caused. Road salts can alter water chemistry and change which types of wildlife can ultimately utilize a wetland area. All precautions should be taken to insure that any water entering the wetlands during and after development is of adequate quality.

Open Space Areas: Whatever type or combination of types of areas are set aside, setting aside an "island of open space" surrounded by development is the least desirable for wildlife. Open space areas should be connected and, ideally, should be connected with open space areas outside of the development site. The open space area should have natural travel pathways for wildlife (i.e., streams, valleys and ridgetops) to enter and exit to other open space areas outside the development. The open space area is more valuable to wildlife if not traversed by roads which may impede the movements of wildlife. Setting aside a combination of habitat types in conjunction with wetlands is desirable.

In a small but heavily developed and populated State like Connecticut, where available habitat continues to decline on a daily basis, it is critical to maintain and enhance, where possible, existing wildlife habitat.

In planning and constructing a development, there are measures that should be considered to minimize adverse impacts to wildlife. Despite these measures, wildlife

habitat will increasingly be adversely affected as the amount of development increases on a site. These measures include:

1) Maintain a 100-foot (minimum) wide buffer zone of natural vegetation, where practicable, around all wetland/riparian areas to filter and trap silt and sediments and to provide some habitat for wildlife.

2) Utilize natural landscaping techniques (avoiding lawns and chemical runoff) to lessen acreage of habitat lost and possible wetland contamination.

3) Stonewalls, shrubs and trees should be maintained along field borders.

4) Early successional stage vegetation (i.e., field) is an important habitat type and should be maintained, if possible.

5) Detention basins should be excavated outside of wetland boundaries.

6) Water draining into any wetlands should be of the best quality possible to prevent degradation of the wetland. BMPs should be used. Oil separators should be installed in catch basins.

7) Proper E&S controls should be maintained throughout construction. Degradation can occur during construction as well as after.

8) Where possible, use bridges instead of culverts.

9) Where applicable, some provision such as a deed restriction or conservation easement should be made to restrict activities such as pasturing animals in a wetland or filling in wetlands for extra lawn and/or garden space after construction.

10) During land clearing, care should be taken to maintain certain forest wildlife requirements:

    a) Encourage mast producing trees (i.e., oak, hickory and beech). A minimum of 5 oaks/acre, 14 inches dbh or greater should remain.

    b) Leave 5 to 7 snag/den trees per acre because they are used by birds and mammals for nesting, roosting and feeding.

    c) Exceptionally tall trees, used by raptors as perching and nesting sites, should be encouraged.

    d) Brush debris from tree clearing should be piled to provide cover for small mammals, birds, amphibians and reptiles.

e) Shrubs, vines and trees which produce fruit should be encouraged (or can be planted as part of the landscaping in conjunction with the development), especially those that produce fruit which persists through the winter (i.e., winterberry). See Appendix B for a list of suggested shrub and tree species that can be encouraged and/or planted to benefit wildlife.

THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

According to the Natural Diversity Data Base, there are no known extant populations of Federal Endangered and Threatened Species or Connecticut "Species of Special Concern" occurring at the site. There is a population of Populus heterophylla near the southwest corner of the site (see Figure 6). Populus heterophylla, Swamp Cottonwood, is being proposed as a State Endangered Species according to Public Act 89-224, "An Act Establishing a Program for the Protection of Endangered and Threatened Species."

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

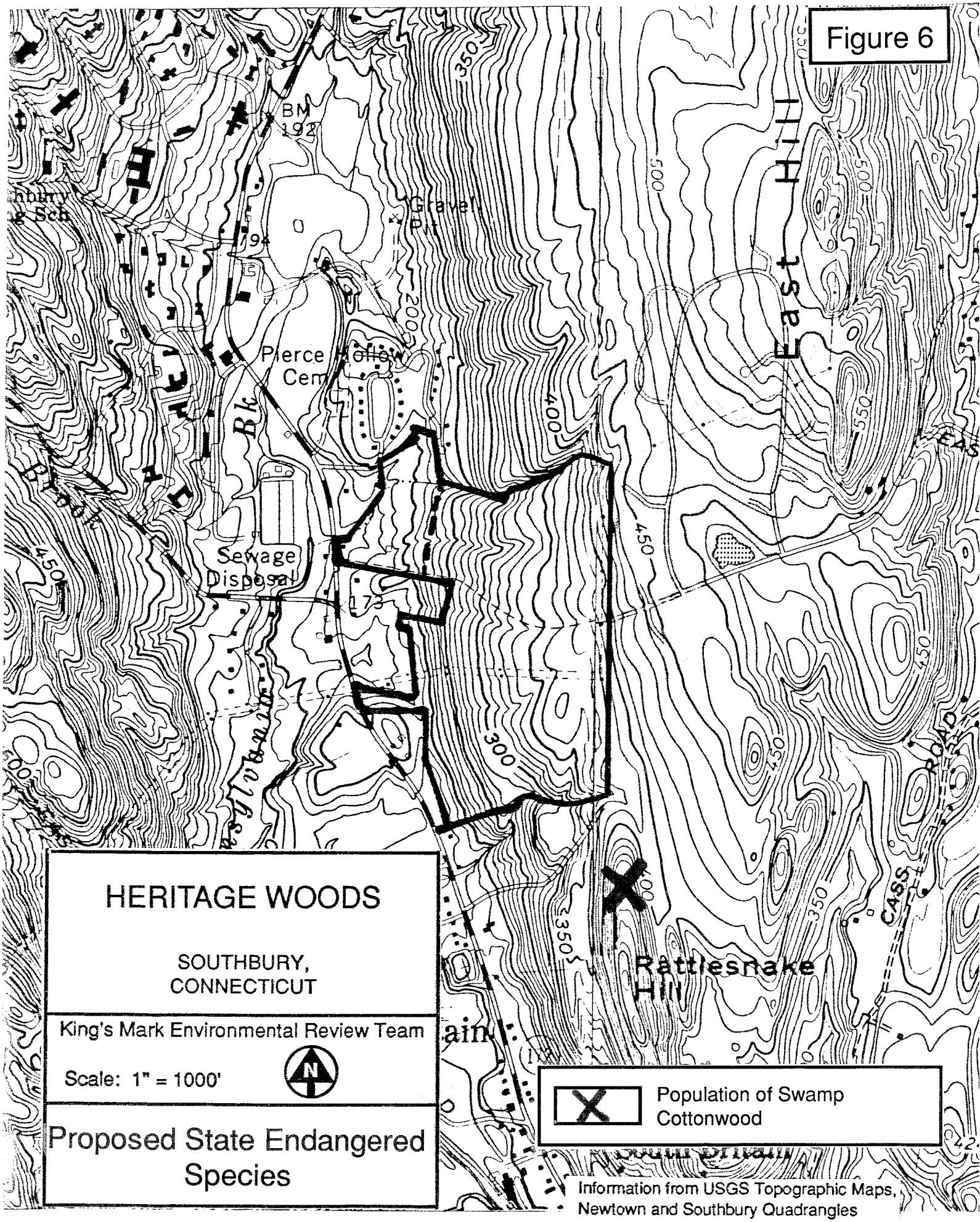
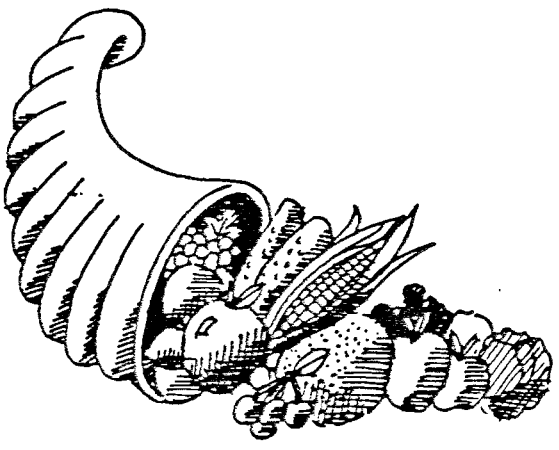


Figure 6
BM 192
Gravel Pit
Pierce Hollow Cem.
Rk
Sewage Disposal
East Hill
Rattlesnake Hill
CASS
ROAD
HERITAGE WOODS
SOUTHBURY, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 1000'
N
Proposed State Endangered Species
Population of Swamp Cottonwood
Information from USGS Topographic Maps, Newtown and Southbury Quadrangles

APPENDICIES



Appendix A: Soil Limitations Chart

MAP UNIT NAME	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	MAJOR LIMITATIONS TO THE DEVELOPMENT OF:	
			HOMES WITH BASEMENTS	ROADS AND STREETS
AfB - Agawam fine sandy loam, 3-8% slopes	Very deep soils on outwash plains and stream terraces	Well-drained >6.0 feet	None	None
AfC - Agawam fine sandy loam, 8-15% slopes	Very deep soils on outwash plains and stream terraces	Well-drained >6.0 feet	Slope	Slope
CfD - Charlton fine sandy loam, 15-25% slopes	Very deep loamy soils formed in friable or firm glacial till on uplands	Well-drained >6.0 feet	Slope	Slope
HkB - Hinckley gravelly sandy loam, 3-8% slopes	Very deep soils formed in water sorted material	Excessively drained >6.0 feet	None	None
HME - Hinckley and Manchester soils, 15-35% slopes	Hinckley - Very deep soils formed in water sorted material	Excessively drained >6.0 feet	None	None
	Manchester - Soils formed in sandy and gravelly glacial outwash and stratified drift	Excessively drained >6.0 feet	None	None
NN - Ninigret fine sandy loam	Very deep soils formed in loamy over sandy and gravelly glacial outwash	Moderately well-drained 1.5-2.5 feet	Wetness	Frost action

MAP UNIT NAME	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	MAJOR LIMITATIONS TO THE DEVELOPMENT OF:	
			HOMES WITH BASEMENTS	ROADS AND STREETS
PbB - Paxton fine sandy loam, 3-8% slopes	Deep loamy soils formed in compact glacial till on uplands	Well-drained perched 1.5-2.5 feet	Wetness	Wetness, frost action
PdC - Paxton very stony fine sandy loam, 8-15% slopes	Deep loamy soils formed in compact glacial till on uplands	Well-drained perched 1.5-2.5 feet	Wetness	Wetness, frost action
PeC - Paxton extremely stony fine sandy loam, 8-15% slopes	Deep loamy soils formed in compact glacial till on uplands	Well-drained perched 1.5-2.5 feet	Wetness	Wetness, frost action
PeD - Paxton extremely stony fine sandy loam, 15-35% slopes	Deep loamy soils formed in compact glacial till on uplands	Well-drained perched 1.5-2.5 feet	Wetness	Wetness, frost action
*RN - Ridgebury, Leicester and Whitman extremely stony fine sandy loams	Soils formed in glacial till	Very poorly and poorly-drained Ridgebury 0-1.5 feet Leicester 0-1.5 feet Whitman +1-0.5 feet	High water table, ponding	Ponding, frost action
*Rb - Raypol silt loam	Very deep soils formed in loamy over sandy and gravelly glacial outwash	Poorly-drained 0-1.0 feet	Wetness	Wetness, frost action

MAP UNIT NAME	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	MAJOR LIMITATIONS TO THE DEVELOPMENT OF: HOMES WITH BASEMENTS	MAJOR LIMITATIONS TO THE DEVELOPMENT OF: ROADS AND STREETS
*Sc - Saco silt loam	Very deep soils formed in alluvial deposits	Very poorly-drained 0-0.5 feet	Flooding, wetness	Flooding, wetness, frost action
WzC - Woodbridge extremely stony fine sandy loam,3-15% slopes	Deep loamy soils formed in compact glacial till on uplands	Moderately well-drained perched 1.5-2.5 feet	Wetness	Frost action
UD - Udorthents, smoothed	Cut or borrow areas, filled area and areas consisting of both cut and fill	Well-drained to excessively drained	Not rated	Not rated

* Inland wetland soil

Appendix B: Suitable Planting Materials for Wildlife Food and Cover

SUITABLE PLANTING MATERIALS FOR WILDLIFE FOOD AND COVER

Herbaceous/Vines	Shrubs	Small Trees
Panicgrass	Sumac	Hawthorn
Timothy	Dogwood	Cherry
Trumpet creeper	Elderberry	Serviceberry
Grape	Winterberry	Cedar
Birdsfoot trefoil	Autumn olive	Crabapple
Virginia creeper	Blackberry	
Switchgrass	Raspberry	
Lespedeza	Honeysuckle	
Bittersweet	Cranberrybush	
Boston ivy		

NOTES

ABOUT THE TEAM

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, soil scientists, foresters, climatologists, landscape architects, recreational specialists, engineers and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - an 83-town area serving western Connecticut.

As a public service activity, the Team is available to serve towns and/or developers within the King's Mark RC&D Area - free of charge.

Purpose of the Environmental Review Team

The Environmental Review Team is available to assist towns and/or developers in the review of sites proposed for major land use activities. For example, the ERT has been involved in the review of a wide range of significant land use activities including subdivisions, sanitary landfills, commercial and industrial developments and recreational/open space projects.

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 site and highlighting opportunities and limitations for the proposed land use.

Requesting an Environmental Review

Environmental Reviews may be requested by the chief elected official of a municipality or the chairman of an administrative agency such as planning and zoning, conservation or inland wetlands. Environmental Review Request Forms are available at your local Soil and Water Conservation District and through the King's Mark ERT Coordinator. This request form must include a summary of the proposed project, a location map of the project site, written permission from the land owner/ developer allowing the Team to enter the property for purposes of review and a statement identifying the specific areas of concern the Team should investigate. When this request is approved by the local Soil and Water Conservation District and King's Mark RC&D Executive Committee, the Team will undertake the review. At present, the ERT can undertake approximately two (2) reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil and Water Conservation District or Nancy Ferlow, ERT Coordinator, King's Mark Environmental Review Team, King's Mark RC&D Area, 322 North Main Street, Wallingford, Connecticut 06492. King's Mark ERT phone number is 265-6695.