KING'S MARK ENVIRONMENTAL REVIEW TEAM

REPORT FOR

NEWBERRY BROOK WATERSHED

TORRINGTON,
CONNECTICUT

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

NEWBERRY BROOK WATERSHED

TORRINGTON, 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

Torrington Inland Wetlands Commission

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 Commission and the City. 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.

APRIL 1990

ACKNOWLEDGMENTS

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Finally, special thanks to Edward Luckacovic, Environmental Planner, Daniel McGuinness, City Planner, City of Torrington, Raymond Antonacci, owner, Burt Hoffman, owner, Amado Budy, architect, Peter Herbst, attorney, Michael Klein, environmental consultant and Marc Beroz, soil scientist, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The Torrington Inland Wetlands Commission requested that an environmental review be conducted on an area which encompasses most of the Newberry Brook Watershed in southwestern Torrington. The City of Torrington is experiencing development pressure in this Watershed. There are 2 large developments in the planning stages. The proposed Newberry Brook Subdivision consists of 214 units, a small commercial development and an open space/school site on 159.25 acres. The proposed Southwoods Subdivision consists of approximately 81 lots on 36.34 acres. The Besse Hill Subdivision was subdivided into small lots (approximately 5,000 square feet) many years ago, and development has started on these lots. Some areas on Besse Hill have very steep slopes. The City is concerned with the cumulative effects of these developments on the water resources and environment in the area.

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.

Setting, Land Use and Topography

The study area is located in southwest Torrington between Route 202 and Highland Avenue. Land use in the area is moderate to high density residences, open fields and woodland. Municipal sewer and water lines are available to the planned developments. There are no services available to Besse Hill at this time, but both utilities are found to the south. Besse Hill has severe limitations to septic system development. The main topographic features are Besse Hill and Newberry Brook. Slopes range from steep to gentle. Development should be kept off the steepest slopes and out of drainage swales.

Geology

The major bedrock type underlying the study area is a Hartland Formation subunit. Other bedrock types include Tyler Lake Granite, Hodges Mafic Complex and the Waramaug Formation. There should be no significant differences in development potential for these rocks. If bedrock wells are drilled, there may be a slight difference in water quality and yield. The eastern part of the study area is characterized by bedrock that is less than 10 feet below the surface. Blasting may be required to place foundations, roads and utilities. Because of the density of the housing to the east, a pre-blast survey is recommended.

Glacial till covers the entire study area. Texture of the till is generally loose and sandy where it is shallow to bedrock, but there may be a hardpan layer in deeper till. The hardpan layer generally results in a seasonally high watertable and slow percolation rates. Hardpan soils can hinder on-site septic development and are susceptible to slumping. Till soils with fine-grained particles can erode if proper

controls are not implemented. Swamp deposits overlie the till in several areas. Wetland soils parallel the streamcourses.

Water Supply

Municipal water lines are available to most of the study area. The City should check with the Torrington Water Company to insure that capacity is adequate to serve the proposed developments. Bedrock is the principal aquifer for wells, if needed. Groundwater quality should be good except possibly in the vicinity of the junk yard. Caution should be used with any wells near the junk yard. Wells drilled in the Besse Hill area may detract from each another because of the small lot sizes. Consideration should be given to extending the water mains to the Besse Hill Subdivision.

Sewage Disposal

Because municipal sewers are available to the developments, many of the hydrogeologic concerns are allayed. The City should make sure that the treatment plant is capable of servicing all of the development proposed. The Besse Hill Subdivision site has severe limitations to septic systems. Due to the proposed densities, there is a potential for groundwater pollution. The water and sewer mains could be extended to serve the site or the small lots could be combined into larger lots with enough area to allow on-site septic systems. Southwoods Subdivision has some lots served by sewage pumping chambers. The Newberry Brook Subdivision shows lots where there could be pumping chambers. The pumping chambers should be located in areas not subject to seasonally high groundwater to protect the pumps from burn-out and to reduce the possibility of groundwater overtaxing the sewer lines.

Hydrology

The majority of the study area is in the Newberry Brook Watershed. A portion of the Besse Hill area drains directly to Gulf Stream. The northern parts drain to Birney Brook. The surface waters are considered Class A. Groundwater is Class GA. Despite the availability of sewer and water lines, there are concerns for impacts to water quality, including substantial land disturbances, soils that are susceptible to erosion, steep slopes which can require cuts and fills and the high percentage of impervious surface proposed. Stormwater management plans should be required for all developments. The goal of the stormwater management plan is to maintain the post-development flows at the pre-development flow levels so that flooding problems do not occur or are not exacerbated. The plan should also address erosion and water quality concerns.

Soil Resources

The dominant soils are Paxton, Gloucester and Woodbridge. Limitations include a hardpan layer, steep slopes and areas that are shallow to bedrock. There are some Prime Farmland and Important Farmland soils in the study area. There are numerous wetland corridors.

Erosion and Sediment Control

E&S control is a major concern for development of the study area. E&S control plans should be submitted for each proposed development. The possibility of water pollution due to sedimentation is greatly increased in areas close to water. Therefore soils adjacent to wetlands and watercourses are critical erosion control areas. A runoff management system controls excess runoff caused by land disturbance. The system is used to regulate runoff and sediment from sites during and after construction. If the purpose of the runoff management is to prevent erosion, the smaller storms should be analyzed. Cleaning and maintenance are very important facets of the system. Adequate rights-of-way should be provided for access. The maintenance access should not be in wetland soils. Components of the runoff management system should be owned by a unit of government that accepts responsibility and can maintain and operate the system. Adequate safety features should be installed.

Wetland Considerations

The wetlands in the study area are found in conjunction with the streams and intermittent watercourses. These wetlands provide wildlife, flood retention, pollution abatement aesthetic and recreational values. Clearing of existing habitat will decrease the wildlife habitat and may degrade the water quality through sedimentation. It is important to protect wetlands for wildlife habitat and passive recreation. Measures which can limit adverse affects include providing setbacks, using bridges rather than culverts, constructing stormwater detention basins outside of wetlands and designing and implementing a complete E&S control plan.

Wildlife Considerations

As with any development, the impact on wildlife will be negative and long-lasting. The habitat will be broken-up by roads and lost through clearing and landscaping. The 3 subdivisions represent a significant change. Certain species which adapt well will increase and can become a nuisance. Sensitive species will either move away or perish. Cluster development is preferred over single-family subdivisions if the density is not increased, because it leaves large open space areas for wildlife. Large lot subdivisions will be less detrimental to wildlife. Wetlands are important to wildlife and should be protected from filling and sedimentation. Detention basins should not be placed in wetlands. A detention basin planed adjacent to a wetland can be designed to serve as wildlife habitat. Wetlands require protection after development as well as during construction, and a buffer is recommended. Ideally, a combination of habitats should be set aside as open space. Whatever areas set aside, an "island" of open space is least desirable. Open space should be connected and provide travel paths for wildlife.

Threatened and Endangered Plant and Animal Species

According to the Natural Diversity Database, there are no Connecticut "Species of Special Concern" or Federal Threatened or Endangered species in the study area.

Archaeology

The study area has a low to moderate sensitivity for archaeological resources. However, 2 rock outcroppings were found near Newberry Brook. These features were often used by Indians for shelter. If these formations remain undisturbed, then action is needed. If these outcrops are going to be disturbed, excavations should be conducted. Historical stonewalls in the study area should be maintained where possible.

Planning Considerations

Zoning in the study area includes RRC, R-15 and R-10. Smaller lot sizes are possible under the R-15 and R-10 under the cluster zoning provision. The new City Plan calls for upzoning the R-10 to R-15. According to the State Plan, the majority of the study area is classified for long-term urban potential. It is suitable for intensive development if sufficient facilities are available. The LHCEO preliminary housing policy encourages housing which retains community character, preserves sensitive areas, promotes open space and recreation areas and promotes affordable housing. The City Plan encourages clustering of developments to preserve open space and to foster affordable housing. Linking of open space areas is endorsed. The study area has been identified as an area in need of more recreational facilities for young users. The open space could be used for passive or active recreation. Consideration should be given to several parks. The judicious use of clustering can provide open space areas.

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INTRODUCTION

The Torrington Inland Wetlands Commission requested that an environmental review be conducted on an area which encompasses most of the Newberry Brook Watershed in southwestern Torrington. The City of Torrington is experiencing development pressure in this Watershed. Currently, 2 large developments are in the planning stages. The proposed Newberry Brook Subdivision consists of 214 units, a small commercial development and an open space/school site on 159.25 acres, of which 37.2 acres are wetlands. There are 12 wetland road crossings proposed, and 4 detention basins will be located in the wetlands. This development will be served by sanitary sewer from Highland Avenue and water from the Torrington Water Company. The proposed Southwoods Subdivision consists of approximately 81 lots on 36.34 acres of which 6.4 acres are wetlands. The road construction will affect the wetlands in 2 places. There will be 2 detention berms located in the wetlands, and 1 detention pond will be located on upland soils. This area will be served by sewer from Wyoming Avenue and Water from the Torrington Water Company. The Besse Hill area was subdivided into small lots (approximately 5,000 square feet) many years ago, and development is started on these lots. Some areas on Besse Hill contain very steep slopes. There are currently no sewer or water lines to the Besse Hill area, but both utility lines run along Route 202. The City is concerned with the cumulative effects of these developments on the water resources and environment in the area.

The purpose of this review is to inventory and assess existing natural resources, particularly wetland and water resources. This environmental information will assist the City in guiding conservation and development in this area. Specific objectives include:

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

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

3) Discuss soil erosion and sedimentation concerns;

4) Assess the impact of development on wetlands and watercourses;

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

6) Assess planning and land use issues.

THE ERT PROCESS

Through the efforts of the Torrington Inland Wetlands Commission, the developers' 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 planning and 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);

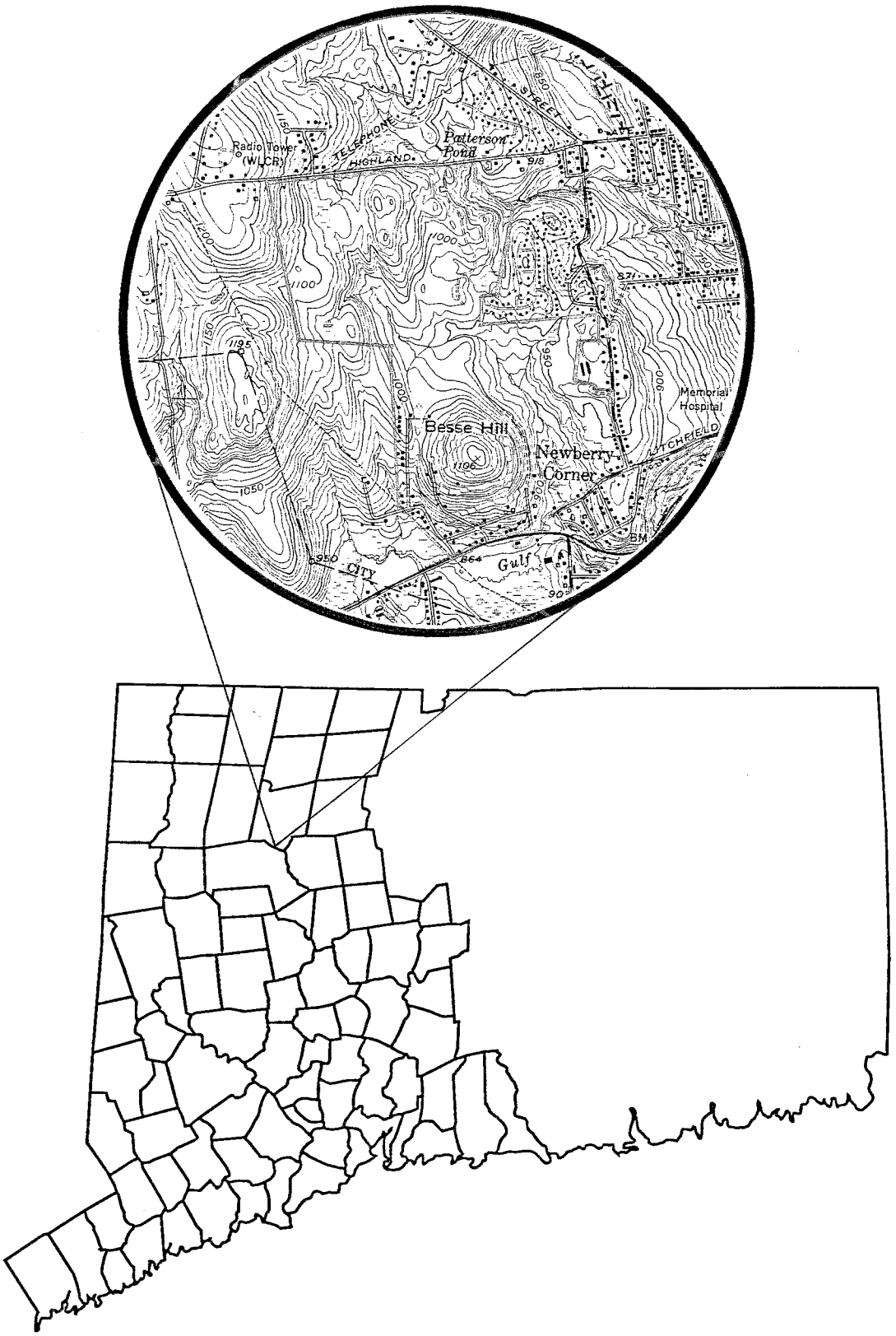
3) Identification of resource problem areas; and

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 February 28, 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.

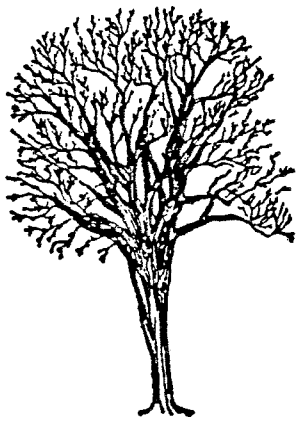
Figure 1

LOCATION OF STUDY SITE



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.

PHYSICAL CHARACTERISTICS



SETTING, LAND USE AND TOPOGRAPHY

The study area is approximately 450 acres in size and is located in southern Torrington near the Litchfield border. Newberry Brook, a Gulf Stream tributary, is the principal streamcourse in the study area. Boundaries for the study area include Route 202 and Litchfield Street on the south, Wyoming Avenue/Aetna Avenue on the east, Highland Avenue on the north and Linton Street and wooded, undeveloped land on the west.

There are 2 large developments in the planning stages for the study area. Southwoods Subdivision consists of 81 lots on approximately 36 acres. Newberry Brook Subdivision consists of 214 units, a small commercial development and an open space/school site on approximately 159 acres. Additionally, the Besse Hill Subdivision is an approved high density residential development (approximately 5,000-square-foot lots). Development in the Besse Hill Subdivision has started. With the exception of an automobile junk yard in the central parts, the remainder of the study area is generally wooded and undeveloped.

Land use in the vicinity consists of moderate to high density single-family residences. Numerous open farm fields and a high density residential development known as Greenbrier Estates characterize the area to the west. According to Town officials, the study area is zoned for high density residential land uses (see Planning Considerations section).

Municipal sewers and public water supply mains by the Torrington Water Company are available to the Southwoods and Newberry Brook Subdivisions. Currently, no sewer or water lines are available to the Besse Hill Subdivision, but both utility lines run along Route 202 to the south. The severe physical limitations (i.e., steep slopes and seasonally high watertable) and generally small lot sizes combine to create a high potential for septic system problems at the Besse Hill

Subdivision. Therefore, extension of the sewer and water mains is inevitable for development at the proposed densities.

The main topographical features of the study area include Besse Hill, a conical-shaped hill in the southern parts and Newberry Brook with its accompanying floodplains/wetlands. The northcentral parts of the study area form the headwaters for Newberry Brook which flows generally in a southeasterly direction towards Newberry Corner and ultimately discharges to Gulf Stream.

Topography of the study area consists generally of moderate slopes. However, very steep slopes and gentle slopes also occur (see Figure 2). The steepest slopes are concentrated on Besse Hill and in the northcentral and northwest corner of the study area where hilly terrain occurs. Gentle slopes occur mainly in the Newberry Brook Valley. The highest elevation, approximately 1,200 feet above mean sea level, occurs in the northwest corner of the study area, and the lowest elevation, approximately 860 feet above mean sea level, occurs at the intersection of Litchfield Street and Newberry Brook.

Topographic conditions vary widely within the study area. The proposed development plans for the Southwoods and Newberry Brook Subdivisions should avoid placing buildings on the steepest slopes and in topographic swales where surface water may cause problems such as wet basements. Avoiding the steeply sloping areas for house sites will reduce the amount of significant cuts and fills and subsequent land disturbance, the potential for soil slumping and stabilization difficulties, particularly in hardpan soils, the potential for lawn mowing accidents and the potential for soil erosion and sedimentation problems. Roads and driveways should be laid out to cross slopes and conform to topographic contours, rather than cut perpendicular to steeply sloping areas.

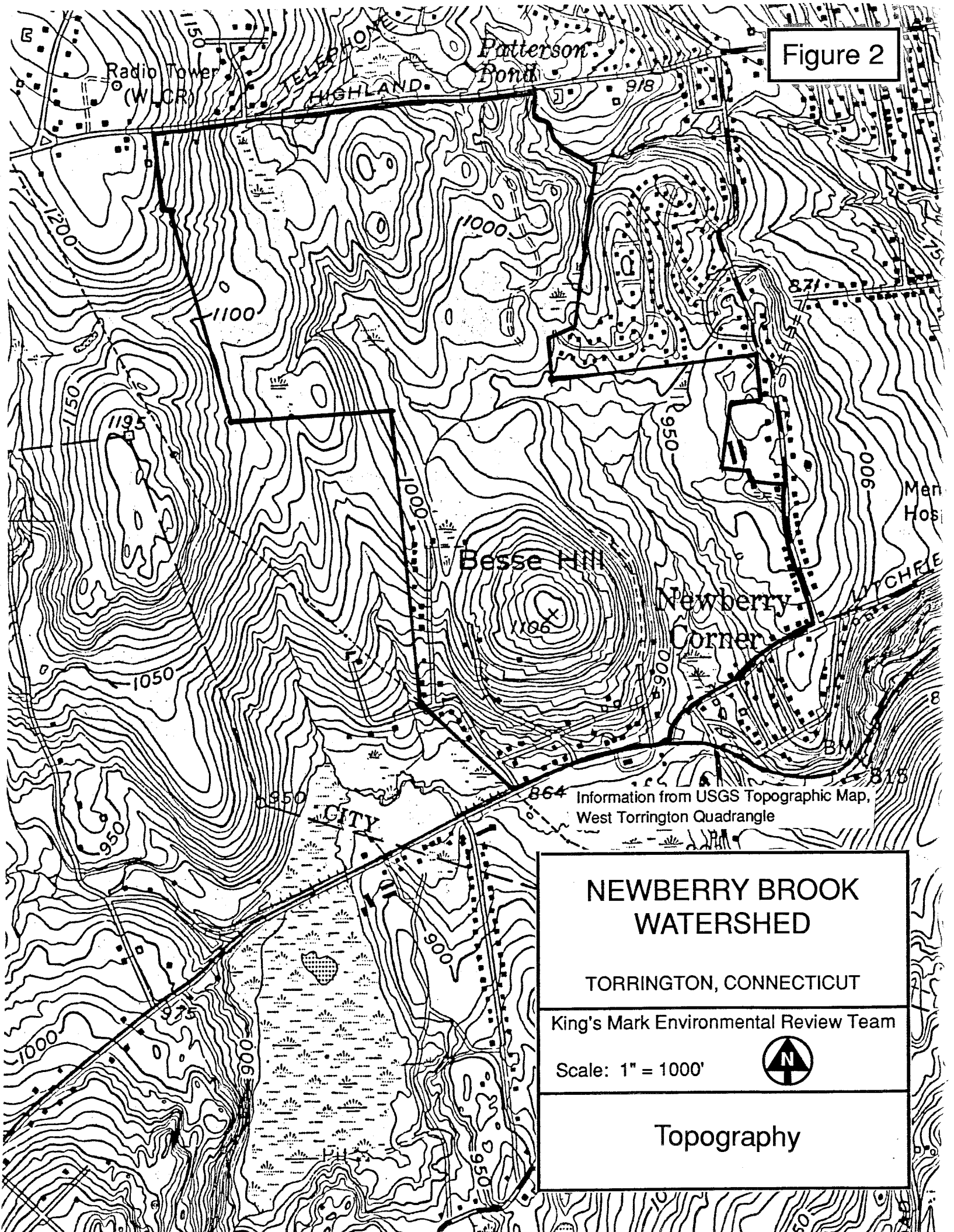


Figure 2
Radio Tower
(WLCR)
TELEPHON
HIGHLAND
Patterson
Pond
918
1200
1150
1100
1000
1195
1150
950
900
871
Besse Hill
1106
Newberry
Corner
1050
950
CITY
900
975
1000
900
950
BM
815
864
Information from USGS Topographic Map,
West Torrington Quadrangle
NEWBERRY BROOK
WATERSHED
TORRINGTON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 1000'
N
Topography

GEOLOGY

The study area is located entirely within the West Torrington topographic quadrangle. A bedrock geologic map (QR-17 by R.M. Gates and N.I. Christensen) and a surficial geologic map (GQ-727 by R. Colton) for the quadrangle have been published by the Connecticut Geological and Natural History Survey and U.S. Geological Survey, respectively.

Bedrock Geology

Gates and Christensen (1965) identify the major bedrock type, which covers approximately 75% of the study area, as a Hartland Formation subunit. It is described as light-gray, fine- to medium-grained granulite whose major minerals consist of mica, quartz and plagioclase. Another bedrock type, Tyler Lake Granite, occurs in the eastern parts. It is described as a white granitic gneiss because of the high amounts of light-colored minerals such as quartz, microcline and plagioclase. A narrow prong of a Hodges Mafic Complex subunit underlies the northwestern part of the site. It is described as a fine- to medium-grained amphibolite whose major minerals include hornblende and plagioclase. The Waramaug Formation is sandwiched between the Hartland Formation and Tyler Lake Granite rocks in the northeast corner. This formation is described as a rusty-weathering gneiss composed of quartz, plagioclase, biotite, garnet and/or sillimonite. Figure 3 shows the distribution of bedrock types in the study area.

Gneisses, amphibolites and granulites are crystalline and metamorphic, which means they have been geologically altered by great heat and pressure deep within the earth's crust. Gneisses are rocks in which dark-colored minerals alternate with light-colored minerals giving the rock a banded appearance. Amphibolites are typically dark-colored, fine- to coarse-grained, massive to poorly layered rocks composed of amphibolite minerals such as hornblende and plagioclase. Little or no

quartz is generally found in this rock. Granulites are rocks composed of even-sized interlocking granular minerals.

The differences among the 4 bedrock types found in the study area should have little or no influence on development in the study area, because municipal water mains are available to the study area. If bedrock wells are utilized, there may be a difference in water well yields and quality between the rock units, but significant differences are not anticipated. All of the rocks are fairly competent and, if encountered, will probably require blasting.

Approximately 45% of the study area, the majority of which occurs in the eastern parts, is characterized by bedrock which is less than 10 feet below the ground surface. Excavation for house and building foundations, utility lines or desired road and/or driveway grades may be difficult, especially in these areas. Blasting may be required. Any blasting should be conducted under the supervision of persons experienced in modern blasting techniques to avoid undue seismic shock or air blast. Because of the high density housing occurring to the east, a pre-blast survey of surrounding properties is recommended. No specific data from borings or deep test holes has been compiled for either of the proposed developments. This information would determine subsurface conditions and the amount of blasting required. The proposed Newberry Brook Subdivision layout will require significant cut areas in many places and may encounter bedrock.

Surficial Geology

A glacial sediment called till covers the entire study area (see Figure 4). Till, which is generally grayish in color, is composed of rock particles and fragments, including clay, silt, sand, pebbles, cobbles and boulders, which were deposited directly by glacier ice. The textural components of the till are not sorted. Fine-grained particles are intermixed with coarse-grained particles, although sand and silt predominate. The till in the study area is generally loose (sandy) in the first 2-3

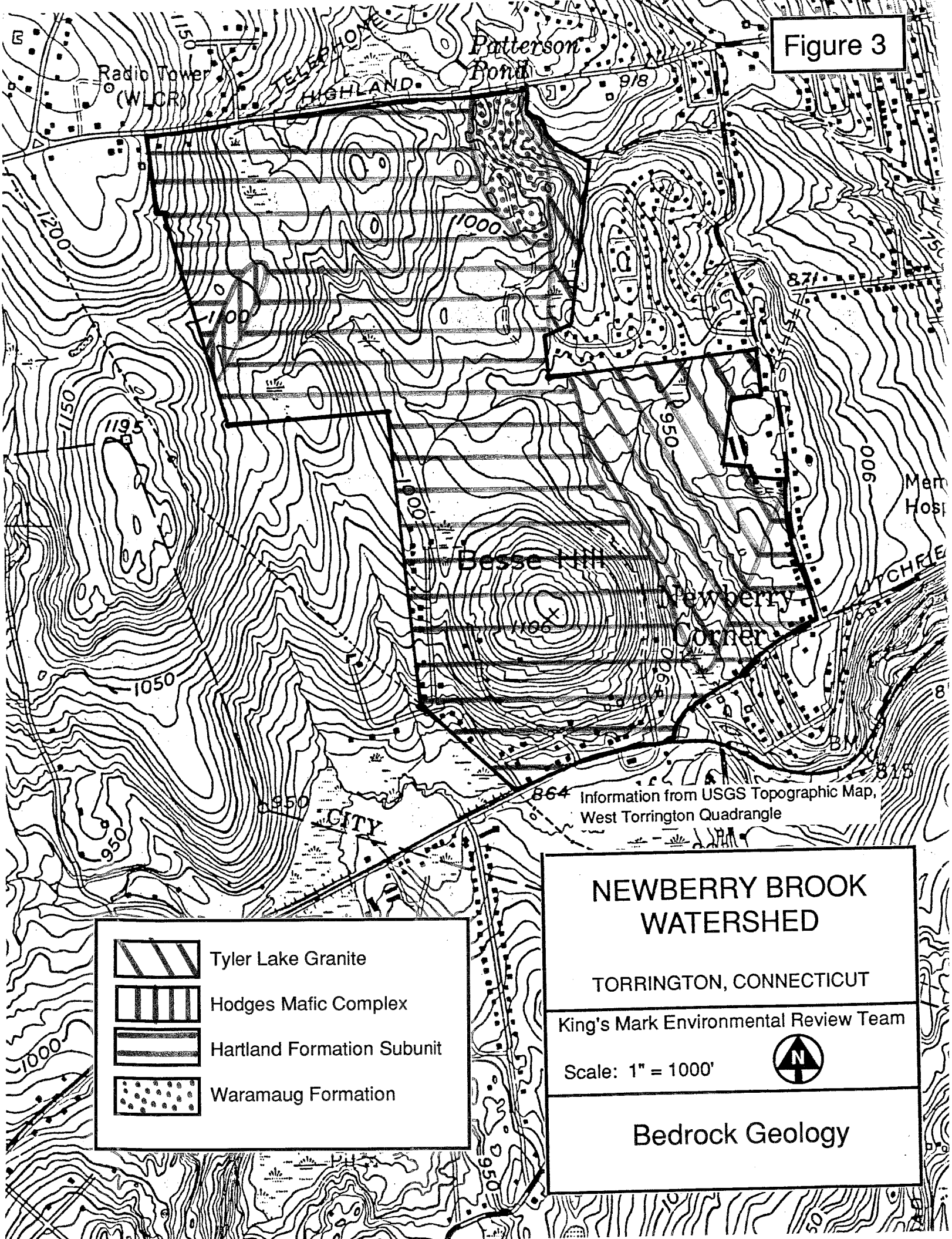


Figure 3
Radio Tower (WLCR)
HIGHLAND
Patterson Pond
Besse Hill
Newberry Corner
CITY
Information from USGS Topographic Map, West Torrington Quadrangle
Tyler Lake Granite
Hodges Mafic Complex
Hartland Formation Subunit
Waramaug Formation
NEWBERRY BROOK WATERSHED
TORRINGTON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 1000'
Bedrock Geology

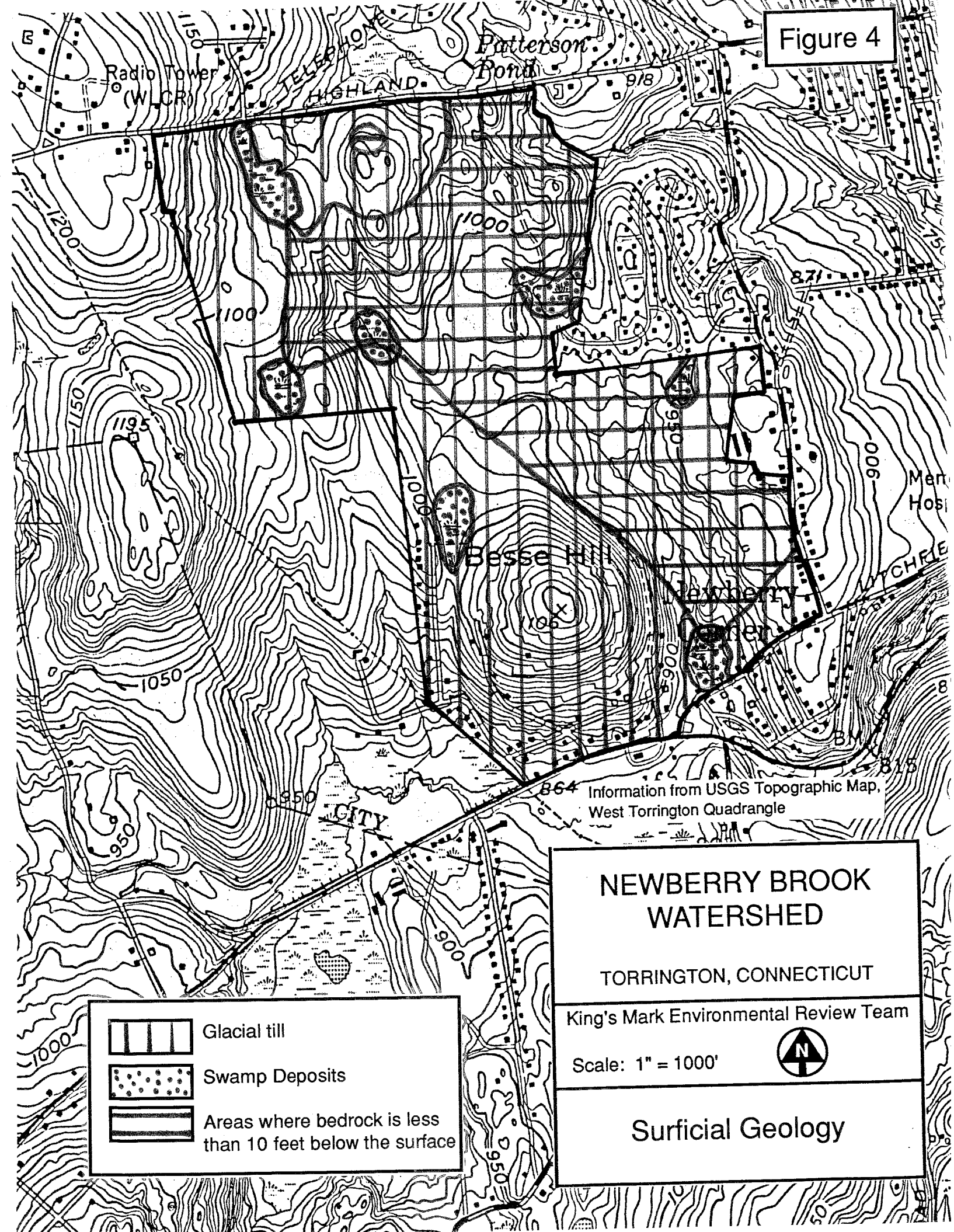


Figure 4
Radio Tower (WLCR)
HIGHLAND
Patterson Pond
Besse Hill
CITY
Information from USGS Topographic Map, West Torrington Quadrangle
Glacial till
Swamp Deposits
Areas where bedrock is less than 10 feet below the surface
NEWBERRY BROOK WATERSHED
TORRINGTON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 1000'
Surficial Geology

feet of the deposit and in shallow to bedrock areas. However, where till exceeds 6-8 feet in depth, a compact (siltier) layer, called hardpan, may underlie the friable till. Based on the Soil Survey of Litchfield County, Connecticut, the compact till occurs mainly in the Besse Hill area.

The presence of the hardpan layer in till typically results in a seasonally high watertable condition, strong soil mottling (an indicator of high groundwater tables) just above the hardpan layer and moderately slow to slow percolation rates. The seasonally high watertable is an important design constraint for on-site sewage disposal and road and driveway construction, particularly where cuts are required. Except for the Besse Hill Subdivision, on-site septic systems are not planned for the study area (see Sewage Disposal section). Houses constructed on hardpan soils should be protected by footing drains to keep basements dry.

Because till soils may be characterized by fine-grained particles (silt, fine sand and clay), they are more susceptible to erosion, if proper control measures are not implemented. Therefore, any development that takes place in the study area should be accompanied by a comprehensive soil erosion and sediment (E&S) control plan.

Any cuts that occur in hardpan soils are extremely difficult to stabilize due to seepage of water over the hardpan layer. This water creates an unstable condition just below the seepage line. The weight of free unstable soil causes the soil to flow down the slope. 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 unsightly conditions, the eroded soil must be removed from the base of the slope.

Relatively small pockets of swamp deposits overly till in several areas. Swamp deposits, which formed after the glacier disappeared, consist of dark brown to black peat and muck mixed or interbedded with silt, sand and clay. These deposits are generally 5-10 feet thick.

According to the Soil Survey of Litchfield County, Connecticut, Newberry Brook, Birney Brook and other unnamed streamcourses in the study area are paralleled by regulated soils, primarily Lg soils. The Lg soils have been mapped as an undifferentiated unit comprising Leicester, Ridgebury and Whitman very stony fine sandy loams. All 3 soils are very deep, loamy soils that formed in glacial till. The Ridgebury and Whitman soils developed in the compact glacial till, while the Leicester soils developed in the more friable till. They are poorly drained (Leicester and Ridgebury) to very poorly drained (Whitman). In general, the Leicester and Ridgebury soils are nearly level or 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.

The seasonally high watertable is the major engineering concern for these soils. A high watertable condition is at or near ground surface in the Leicester and Ridgebury soils generally between November and May. In the Whitman soils, a high watertable condition occurs September through June (see Wetland Considerations section).

WATER SUPPLY

Municipal water mains from the Torrington Water Company are available to the study area, except near Besse Hill. The City should make sure that there is enough capacity to serve the developments. The availability of the water mains will eliminate the need for individual on-site wells tapping the underlying bedrock, the principal aquifer in the study area. Although not a prolific aquifer, the underlying metamorphic bedrock is capable of yielding a few gallons of water per minute, which is adequate for most domestic purposes. Groundwater moves through bedrock by way of an interconnected fracture system. Most wells that penetrate 150-200 feet of

bedrock will intersect enough fractures to supply at least 2 or 3 gallons per minute. However, some wells fail to intersect any water bearing fractures. There is no practical way of predicting which locations are better for drilling a well.

The quality of the groundwater is generally good, except possibly in the vicinity of the automobile junk yard at the end of Linton Street. Groundwater from the underlying bedrock in the study area may contain elevated levels of iron and manganese which would require filtration. The Town should use considerable caution in allowing the use of bedrock wells near the junk yard. A serious risk of well pollution could occur there. If any development occurs near the junk yard, consideration should be given to extending the public water supply main. The same consideration should be given for the Besse Hill Subdivision where a large number of on-site wells will be concentrated in a relatively small area. If wells are spaced too closely, the wells may detract from each other during pumping periods.

SEWAGE DISPOSAL

Because municipal sewers are presently available to the study area, except in the vicinity of Besse Hill, the principal hydrogeologic and environmental concerns associated with individual on-site septic systems will be allayed. The City should be sure that the sewage treatment plant has the capacity to serve the proposed developments. The Besse Hill Subdivision site has severe limitations for septic system installations due to the presence of hardpan soils, steep slopes and high watertables. These limitations combined with the small lot sizes approved create a definite potential for future septic system problems.

To maintain sufficient groundwater quality for individual on-site wells, residential development on till covered areas such as Besse Hill should be at a density not exceeding 1 dwelling unit per acre. However, where severe adverse conditions

exist (i.e., steep slopes, poor soils, high watertable areas, etc.) larger lot sizes may be needed. In general, the Besse Hill Subdivision allows a density 8 times greater than the recommended 1 dwelling per acre. Therefore, if individual on-site wells and septic systems are permitted on these lots, the potential exists for groundwater contamination problems. Extending the municipal sewer and water mains to the subdivision site will avoid these problems. Or undeveloped 1/8-acre lots could be combined into lots 1-acre or more in size as another mitigative measure. The financial implications may not make this alternative attractive, but if lot owners are aware of the potential septic system problems that may arise and the cost of sewer line extension to the area in the future, it may be a viable solution.

Extension of the sewer line to the Besse Hill Subdivision will minimize the potential of surface and groundwater contamination in the Newberry Brook and Gulf Stream Watersheds.

Plans for the proposed Southwoods Subdivision indicate that some lots (Lots 54-57) will be served by pumping chambers that lift the effluent to sewer mains which are at a higher elevation than the discharge point for the dwelling being served. Careful examination is warranted on these lots with respect to pump chamber locations and the high groundwater table condition. Groundwater may infiltrate the pump chamber if it is placed below the seasonal high groundwater level, causing the pump to run incessantly and burn-out prematurely and possibly overtax sewer lines with groundwater. Every effort should be made to locate the pump chamber in areas not subject to seasonally high groundwater. The plans identified the soils in the vicinity of Lots 54-57 as SxC (Sutton very stony fine sandy loam). The Sutton soils typically have a seasonally high watertable at a depth of approximately 1.5-2.5 feet. The Newberry Brook Subdivision also contains soils characterized by high groundwater tables. All lots that require pumping chambers should be noted on the subdivision plans.

HYDROLOGY

The study area includes 3 watersheds (see Figure 5). The majority of the site, approximately 277 acres, drains to Newberry Brook which flows generally in a southeast direction through the central and southeast corner of the site enroute to Gulf Stream. At its point of outflow to Gulf Stream, Newberry Brook drains an area of approximately 333 acres. Most of the Newberry Brook Watershed in the study area is undeveloped, except at its southern limits. The automobile junk yard located at the end of Linton Street, the proposed Southwoods Subdivision, approximately half of the Besse Hill Subdivision and a portion of the proposed Newberry Brook Subdivision are all located in the Newberry Brook Watershed. Approximately 51 acres in the southern parts of the study area, including approximately half of the Besse Hill Subdivision, drain generally southward into Gulf Stream. The northern parts of the study area, which comprise 112 acres, drain to the inlet and outlet stream (Birney Brook) for Patterson Pond. Birney Brook flows through the northeast corner of the site in an easterly direction enroute to Naugatuck River.

According to the Water Quality Classifications Map of Connecticut (Murphy, 1987), the surface waters in the study area have not been classified by the Department of Environmental Protection (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. However, certain discharges may be allowed. Groundwater within the study area is classified GA, which means it is suitable for private drinking water supplies without treatment.

Despite the anticipated use of municipal water and sewer mains to the study area, a serious concern exists regarding potential surface water degradation to

Newberry Brook and other streamcourses, resulting from construction and the high densities of the proposed subdivisions. The main reasons for concern include:

1) The zoning of the study area permits high density developments, ultimately resulting in substantial land disturbances.

2) The presence of till soils, the majority of which may have a high silt and clay content, makes the soil susceptible to erosion.

3) The presence of moderate to very steep slopes exacerbates the potential for soil E&S control problems and, in places, requires significant cuts and fills in shallow to bedrock and hardpan soils.

4) The creation of a high percentage of impervious surfaces has the potential to adversely impact streamcourse and wetland hydrology in the study area, including flooding, streambank erosion and water quality degradation.

All of these conditions, singly or in combination, pose a serious threat to the water quality of surface waterbodies and wetlands.

Precipitation, which takes the form of runoff, flows across the surface of the land until it reaches a streamcourse or other surface waterbody. Precipitation may also be absorbed into the ground. Once absorbed, the water may either be returned to the atmosphere through evaporation and/or plant transpiration, or it may percolate downward to the watertable and eventually becomes part of the groundwater. Once the water reaches the groundwater table it moves downslope by the force of gravity, ultimately discharging to the surface in the form of a spring, wetland area, stream, lake or river. To a large degree, groundwater flow in an area reflects the surface flow pattern.

Due to the densities permitted by zoning, the amount of land disturbance expected and the amount of impervious surfaces to be created, surface drainage in the study area is expected to change dramatically following development. Therefore, a stormwater management plan, including hydrologic calculations, should be prepared for each proposed subdivision.

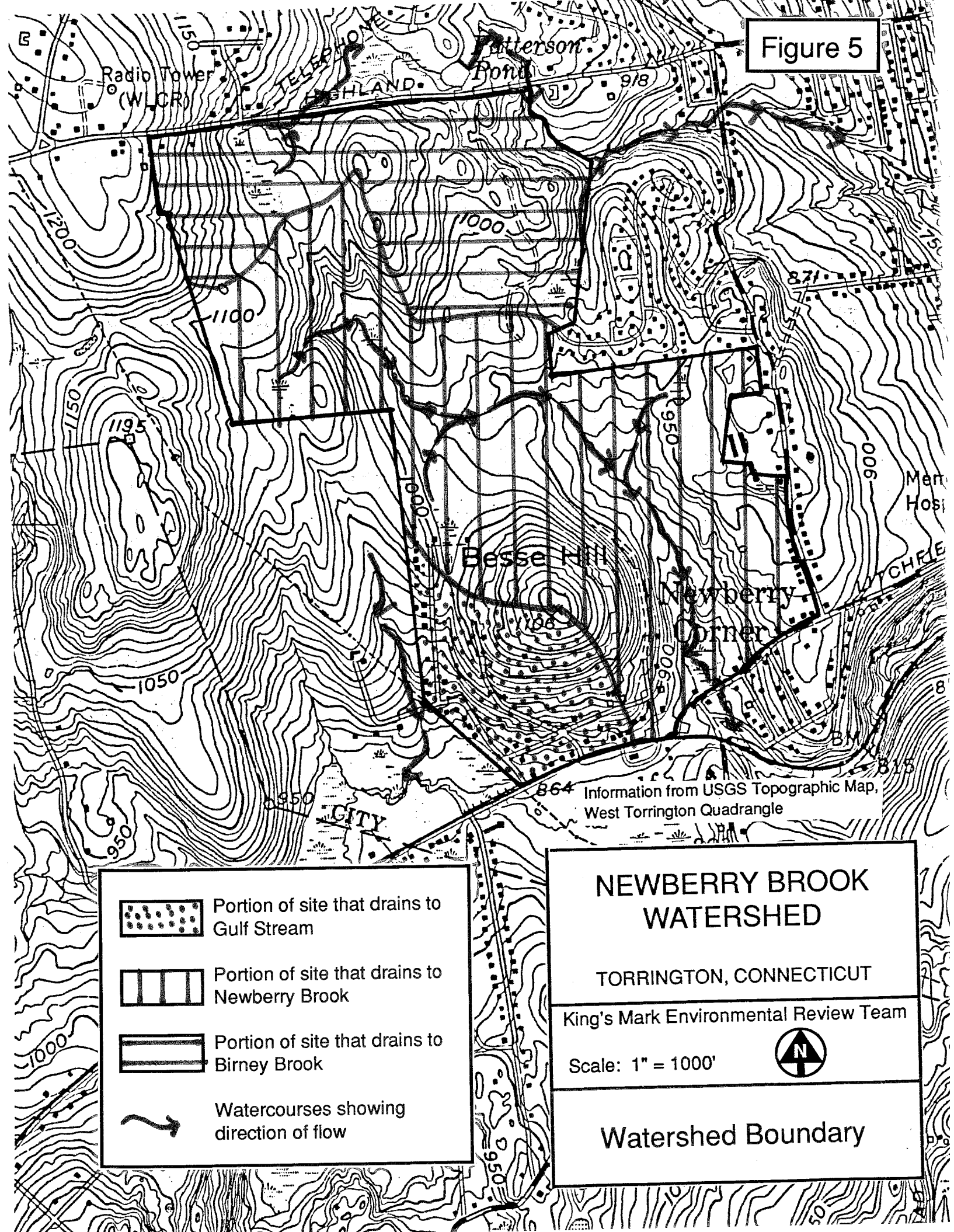


Figure 5
Radio Tower (WLCR)
Patterson Pond
HIGHLAND
Besse Hill
Newberry Corner
CITY
Information from USGS Topographic Map, West Torrington Quadrangle
Portion of site that drains to Gulf Stream
Portion of site that drains to Newberry Brook
Portion of site that drains to Birney Brook
Watercourses showing direction of flow
NEWBERRY BROOK WATERSHED
TORRINGTON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 1000'
N
Watershed Boundary

The overall goal of each stormwater management plan should be maintaining existing runoff patterns and maintaining post-development flows at pre-development flow levels so that flooding problems do not occur and existing flooding problems are not further aggravated in downstream areas. This can be accomplished by using control structures (detention basins) that will collect and hold stormwater generated by the subdivisions for slow release to downstream watercourses. The release rate should be designed not to exceed pre-development conditions for the various design storm events. Design of proposed detention basins should be in accordance with the Detention Basin (DB) Standard contained in Chapter 8 of the Connecticut Guidelines for Soil Erosion and Sediment Control (1985, as amended) and checked by the City engineer. A plan of operation and maintenance should be prepared for use by the owner or person responsible for the system to ensure that each component functions properly. This information should be included on the plan. Every effort should be made to minimize potential adverse impacts to wetlands and watercourses in the study area. Detention basins and other stormwater control features should be located outside of wetland areas and streamcourses.

The stormwater management plan should also address the potential impacts of streambank erosion and surface water degradation. Due to moderate to very steep slopes, silty soils, the anticipated amount of land disturbance and the anticipated densities for development, the potential to degrade surface waters on- and off-site during and following development is high. A comprehensive E&S control plan for each development is needed to minimize potential environmental impacts to water and wetland resources. E&S control measures such as silt fences, haybales, anti-tracking devices and temporary/permanent sediment ponds should be used to prevent transport of sediments or turbid water.

Stormwater runoff from the new roads in the study area will likely be intercepted by catch basins and routed to discharge points in detention basins or in

the vicinity of wetlands. All catch basins should be equipped with sediment traps and maintained as necessary. All stormwater discharge points should terminate outside of wetlands and be designed so that flow velocities are reduced and soil erosion minimized at the discharge point. This can be achieved by a properly designed energy dissipator.

SOIL RESOURCES

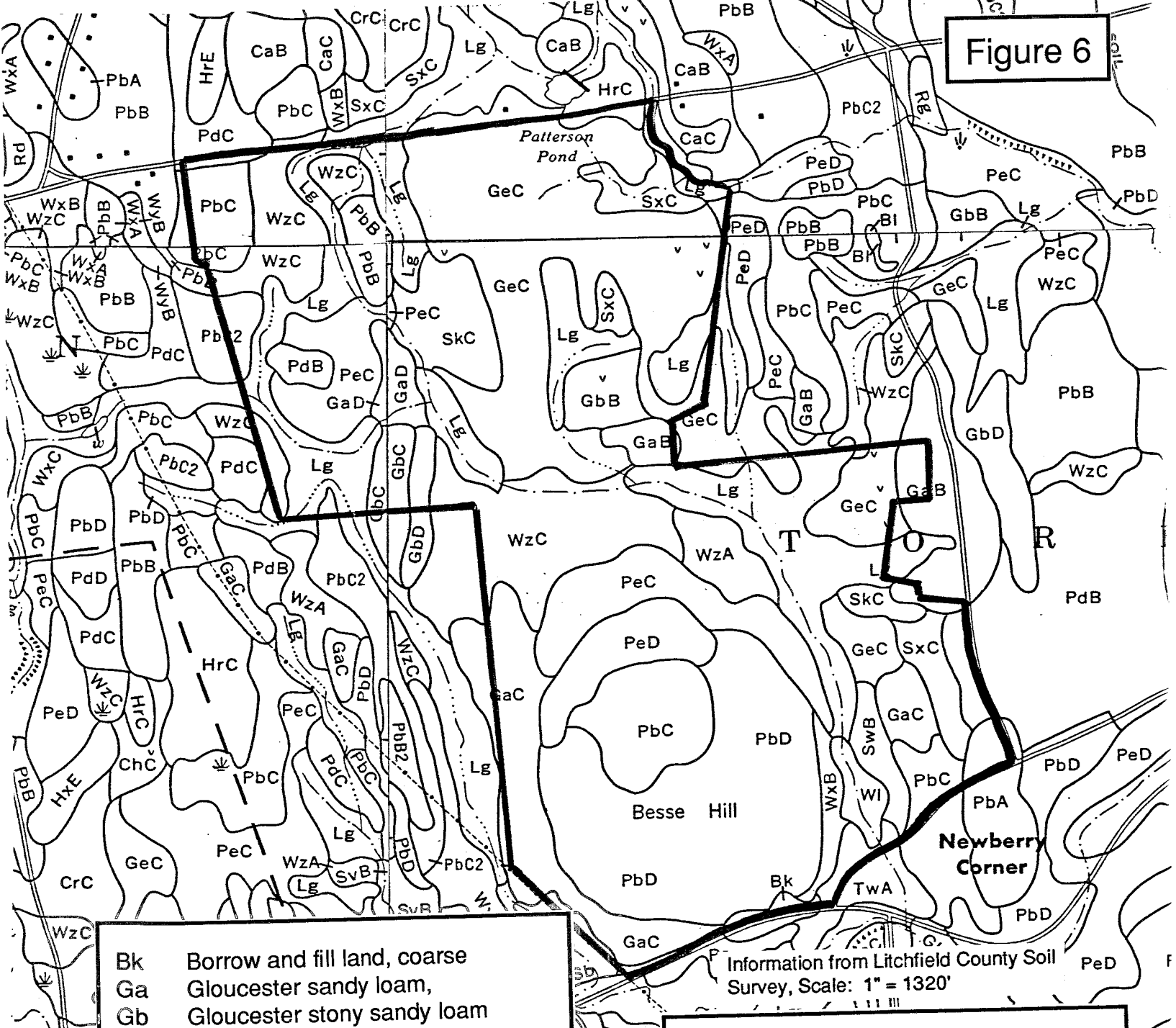
The Paxton, Gloucester and Woodbridge soils dominate the study area. The different soil locations are shown in Figure 6, which is an excerpt from the Soil Survey of Litchfield County, Connecticut. On-site soil investigations are needed for each subdivision proposal. A description of each soil can be found in the soil survey. Soil characteristics are summarized in Appendix A, Tables 1-3.

Paxton soils are well-drained. They are generally good soils for construction, providing slopes are not too steep. The Paxton soils have a hardpan layer at approximately 24 inches in depth. The hardpan layer can hold water (a perched watertable) during wet seasons. The Woodbridge soils also have a hardpan layer at 18-24 inches in depth. Due to the seasonal high watertable in the Woodbridge soils, wetness is a limitation to development. Seepage of cut slopes in the Paxton and Woodbridge soils can cause erosion problems.

The hardpan layer of the Paxton and Woodbridge soils is a constraint to septic system design. Limitations for septic design are greater in the Woodbridge soil due to the seasonal high watertable. The developments proposed in the study area include municipal sewer hookups, avoiding the septic system design limitations.

The Gloucester soils are somewhat excessively drained. These soils are droughty and may have some limitations for landscaping. The subsoil is coarse-

Figure 6



Bk	Borrow and fill land, coarse
Ga	Gloucester sandy loam,
Gb	Gloucester stony sandy loam
Ge	Gloucester very stony sandy loam
Lg	Leicester, Ridgebury and Whitman very stony fine sandy loams
Pb	Paxton fine sandy loam
Pd	Paxton stony fine sandy loam
Pe	Paxton very stony fine sandy loam
Ru	Rumney fine sandy loam
Sb	Saco silt loam
Sk	Shapleigh very rocky sandy loam
Sw	Sutton stony fine sandy loam
Sx	Sutton very stony fine sandy loam
Wx	Woodbridge fine sandy loam
Wy	Woodbridge stony fine sandy loam
Wz	Woodbridge very stony fine sandy loam

Information from Litchfield County Soil Survey, Scale: 1" = 1320'

NEWBERRY BROOK WATERSHED

TORRINGTON, CONNECTICUT

King's Mark Environmental Review Team

Scale: 1" = 1000'

Soils

grained and generally provides a poor filter for septic systems. This should not be a limitation within the study area due to accessible sewer hookups.

Most of the soils in the study area are deep to bedrock. There are few areas which are shallow to bedrock. These shallow areas may occur locally and should be mapped by private soil scientists. Where shallow to bedrock areas do occur, blasting may be required for land grading. These soils pose severe limitations for landscaping.

There are also areas of Paxton and Gloucester soils on very steep (D) slopes. Steep slopes cause severe limitations for land grading and construction, especially with small lots. Larger lot sizes and open space areas should be considered on these slopes. The Besse Hill Subdivision site contains very steep slopes.

There is a small percentage of Prime Farmland and Important Farmland soils in the study area (see Figure 7). The USDA Soil Conservation Service promotes the preservation of these soils because of their critical role for agricultural production. Federal money for affordable or other housing may be regulated on Prime Farmland and Important Farmland soils. These areas make excellent community garden sites and recreation areas within a subdivision.

There are numerous inland wetland soil areas within the study area, including the Lg, Sb and Ru soil mapping units (see Figure 7). All of these soil types are provided equal protection under the Connecticut Inland Wetland and Watercourses Act. The Lg soil mapping unit is the dominant wetland soil in the study area and throughout Litchfield County. Permits are required for any disturbance within wetland areas or within Torrington's regulated inland wetland setback areas. The setback distances vary by soil type.

EROSION AND SEDIMENT CONTROL

E&S control is a major concern for development of the study area. E&S control plans should be developed for each proposed subdivision per Public Act No. 83-388. The plans should be properly installed, and the installations should be periodically monitored and maintained.

The E&S control plans should consist of:

1) A **narrative** describing the project, the conservation measures planned, the sequence of installation and the maintenance plan;

2) A **map** locating the conservation measures proposed and adequately showing the natural land features and proposed activities; and

3) **E&S details** which show how each measure is to be installed.

When reviewing an E&S control plan, the checklist from Chapter 4 of the Guidelines for Erosion and Sediment Control (revised 1989), which is found in Appendix B, should be followed. All planned E&S control measures should follow the planning and design techniques in the Guidelines for Soil Erosion and Sediment Control.

The Torrington Zoning Regulations give specific details concerning when an E&S control plan is required. This plan must be certified by the Planning and Zoning Commission. E&S controls can have a significant impact on inland wetland areas. The Inland Wetland Commission should thoroughly review all E&S control plans for adequacy in protecting wetlands and watercourses.

The erodibility of the soils in the study area varies. The erodibility class is given in Appendix A, Table 2. Most of the soils fall into the moderate erodibility class. This class does not consider slope percent or slope length. The erosion potential is greatly increased on long, steep slopes.

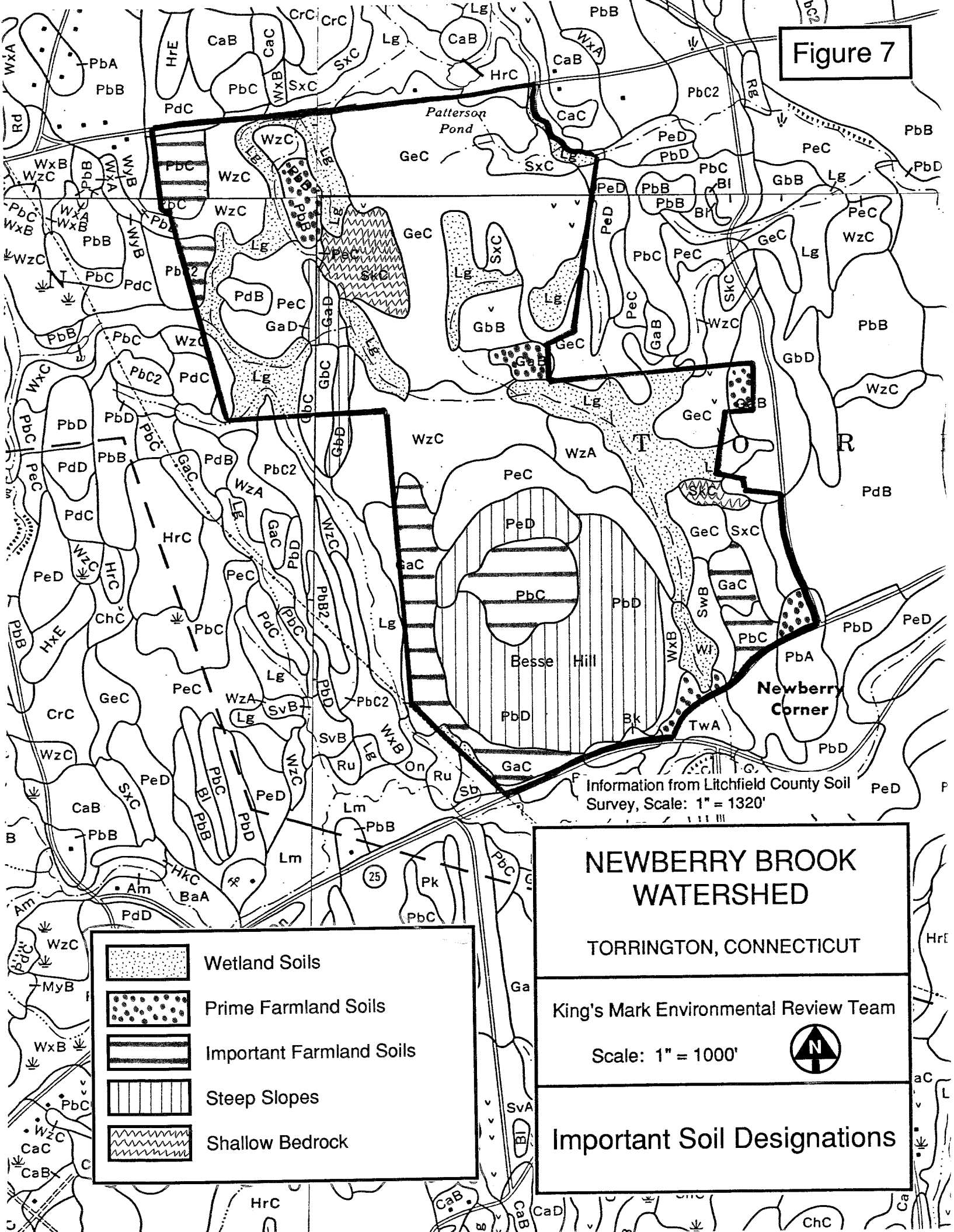


Figure 7
Patterson Pond
Besse Hill
Newberry Corner
T O R
Information from Litchfield County Soil Survey, Scale: 1" = 1320'
Wetland Soils
Prime Farmland Soils
Important Farmland Soils
Steep Slopes
Shallow Bedrock
NEWBERRY BROOK WATERSHED
TORRINGTON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 1000'
N
Important Soil Designations

The hazard of water pollution due to sedimentation is greatly increased in areas close to water. This makes the soils adjacent to inland wetlands and watercourses critical erosion control areas.

The most common erosion control measures which should be used include:

1) Limited land clearing with tree/vegetation protection barriers;
2) Phased construction;
3) Temporary and permanent vegetation on all disturbed land;
4) Mulching and jute net or similar material on sloping disturbed land;
5) Structural bank stabilization on steep wet slopes; and
6) Water diversions and other stabilized concentrated water areas.

Sediment controls are needed when erosion controls fail. The most common sediment control measures which should be utilized include:

1) Temporary silt barriers such as haybales, filter fabric or rock berms; and
2) Sediment detention basins.

The use of haybales rather than filter fabric supports the agricultural community, and haybales are a renewable biodegradable resource. However, the life expectancy of haybale silt barriers is only approximately 60 days. On long-term projects, it may be more effective to use the plastic filter fence which has a life expectancy of 1-2 years.

If sediment basins are planned as permanent site structures, a long-term maintenance plan is needed. Responsibility for maintenance should be clarified prior to approval. Access areas in non-wetlands soils are needed to facilitate clean out.

Stormwater Management

A runoff management system controls excess runoff caused by construction operations, changes in land use or other land disturbances. This system is used to regulate the rate and amount of runoff and sediment from development sites during and after construction operations and to minimize undesirable effects such as flooding, erosion and sedimentation. Components may include, but are not limited to, dams, excavated basins, infiltration trenches, parking lot storage, rooftop storage and underground tanks.

A runoff management system must be compatible with the floodplain management and stormwater management plans of the City and with local regulations for controlling erosion, sediment and runoff. The Storm Drainage Master Plan, Torrington, CT., Birney Brook, 1982 prepared by A-N Consulting Engineers, Inc., can be followed for the Birney Brook Watershed. A-N Engineers, Inc. have also studied 13 other watersheds in Torrington during 1980-83. The runoff management system, a single component or a combination of components, must properly regulate storm discharges from a site to a safe, adequate outlet. Consideration should be given to the duration of flow as well as to the peak discharge. Adequate erosion control measures and other water quality practices must be provided. The components should be planned and designed to insure minimal impact on visual quality and human enjoyment of the landscape.

If the primary purpose of the runoff management system is to minimize flooding, the peak discharge from the 2-year, 10-year and 100-year frequency, 24 hour duration, type II distribution storms should be analyzed. No increase in peak flow from these storms should be allowed unless downstream increases are compatible with the overall floodplain management system. Some of the items to consider include:

1) The timing of peak flows from the sub-watersheds;

2) The increased duration of high flow rates which may cause streambank erosion;

3) The stability of the downstream channels; and

4) The distance downstream that the peak discharges are increased.

There is a documented streambank erosion problem for Birney Brook on the Fallon property on Aetna Avenue, at Beechwood Avenue and between Washington and High Streets. The Soil Conservation Service has been involved with streambank erosion control projects along a portion of Birney Brook. Erosion is evident along Newberry Brook. There is a documented flooding problem where Newberry Brook crosses Litchfield Street. Both erosion control and flood control measures should be addressed in the stormwater management plan.

If the purpose of the runoff management system is to minimize erosion and sedimentation, the peak discharge from the 1-year, 2-year and 10-year frequency, 24 hour duration, type II distribution storms should be analyzed. Small storms (1- to 2-year frequency) are most important for streambank erosion control. Keeping the post-development 2-year frequency design storm within the streambanks is normally not sufficient to prevent downstream bank erosion, since the 2-year flood itself can be an erosive condition.

Cleaning and maintenance of any detention basins should be done in a manner consistent with maintaining a healthy stand of wetland vegetation. A sediment storage area (sediment forebay) is recommended at the inlet of the basin to trap sediment and act as a clean-out point. Sediment removal and plant harvest will remove pollutants from the basins. Care should be taken in the disposal of this material.

Open water-type basins may cause temperature increases in streams. This can have a negative impact on aquatic life. In-stream basins are not recommended.

Shade trees left or replanted around basins can prevent water warming. In some cases, water can be outletted from the basin bottom where water temperatures may be cooler.

To be effective over the design life, runoff management systems must be properly maintained. A plan of operation and maintenance should be prepared for use by the owner or others responsible for the system to ensure that each component functions properly. This plan should provide requirements for inspection, operation and maintenance of individual components, including outlets. It should be prepared before the system is installed and should specify maintenance responsibility. Adequate rights-of-way must be provided for maintenance access. The minimum recommended width for an access right-of-way is 10 feet, and the maximum recommended slope is 15%. A minimum 25-foot maintenance right-of-way is recommended around the perimeter of stormwater detention basins. The maintenance access should not be in wetland soils to prevent wetland disturbance and the difficulty of working in wet soil conditions.

Components of a runoff management system such as dams, excavated basins, infiltration trenches, parking lot storage and tanks should be owned by a unit of government that accepts responsibility for the component and can obtain the money necessary for operation and maintenance. Maintenance by individuals or homeowner associations may be limited by financial reserves and technical expertise. Components such as roof-top storage normally will be owned, operated and maintained by the owner of the property. There should be a legally binding and easily enforceable document or statement attached to the runoff management system plan requiring the owner to operate and maintain the system so that benefits to the public are received over its intended life. This document should be signed by the owner or their authorized representative. The document should contain the following statement: "I hereby acknowledge I have read and do understand the

operation and maintenance plan for _____(project name) as described above. I also agree to fulfill my responsibilities as owner operator of the runoff management system as stated in the plan." _____(signed).

Appropriate safety features and devices should be installed around basins and dams to protect humans and animals from accidents such as falling or drowning. Temporary fencing can be used until barrier plantings are established. Protective measures such as guardrails and fences should be used on spillways and impoundments as needed. A 3:1 slope or flatter is recommended for public safety. Steeper slopes may be difficult to climb.

BIOLOGICAL RESOURCES

WETLAND CONSIDERATIONS

The Newberry Brook Watershed lies within the larger Naugatuck River Drainage Basin. The proposed activities associated with the Southwoods and Newberry Brook Subdivisions will essentially result in the development of most of the Watershed, consequently reducing the natural values the study area currently possesses.

The wetlands in the study area are classified by the National Wetlands Inventory as follows:

PFO1E Palustrine, forested, broad-leaved deciduous, seasonally saturated.

PSS1E Palustrine, scrub/shrub, broad-leaved deciduous, seasonally saturated.

PSS1F Palustrine, scrub/shrub, broad-leaved deciduous, semipermanently saturated.

POWH Palustrine, open water, permanently saturated.

$P\frac{SS1}{EM}E$ Palustrine, scrub/shrub, broad-leaved deciduous, emergent, persistent seasonally saturated.

These wetlands provide important wildlife, flood retention, pollution abatement, aesthetic and recreational values.

The majority of the wetlands in the study area exist in conjunction with several major brook systems in addition to numerous intermittent, meandering watercourses. Because of their close association with streams, they are particularly valuable to wildlife for feeding, watering, breeding and refuge.

Newberry Brook drains into Gulf Stream, which ultimately discharges into the Naugatuck River. The wetlands associated with Newberry Brook filter pollutants

from road runoff from existing developments, decreasing the pollution potential into these larger waterways.

The clearing of existing woodland habitat to accommodate the construction of houses, driveways and roads will result in a decrease in wildlife species populations and species diversity. Wetland habitats and water quality will probably be degraded through direct filling activities and through sedimentation which invariably accompanies residential subdivision developments.

The City of Torrington is currently experiencing rapid, dense development. If this trend continues, eventually open spaces and undisturbed wetland/watercourse corridors will be seriously diminished. It is important for a community to protect and preserve large tracts of open land to provide wildlife a place to retreat and citizens a natural area to enjoy passive recreation. The study area could be developed in a fashion that meets the needs of the City and at the same time is sensitive to the natural resources. This can be accomplished by creative site design that works the project around the natural constraints of the property and reduces the clearing necessary for individual lot development.

These measures are strongly recommended to limit the adverse affects on wetland habitats, water quality and wildlife resources:

1) Maintain a minimum setback of at least 100 feet, where practicable, from all wetlands and watercourses. The clearing of vegetation, construction activities and placement of fill should be prohibited in the setback area. This will provide an upland habitat buffer between development and the wetland habitats. This type of buffer will mitigate impacts to wildlife resources and will improve the quality of stormwater runoff entering wetlands and watercourses.

2) Utilize bridges rather than culverts and roadway fill, where possible, for crossing wetlands and watercourses. Bridges will mitigate wetland habitat impacts by reducing the placement of fill material and by limiting the potential for changes in wetland hydrology.

3) Proposed stormwater detention basins should be constructed outside of wetland boundaries. Under no circumstances should the construction of

detention basins within wetlands and watercourses include the excavation of wetland soils to allow for the construction of a permanent pool of open water. The creation of open water habitats does not necessarily improve habitat quality, it simply replaces 1 type of viable habitat with another, resulting in the displacement of wooded habitat species.

4) Develop and implement comprehensive, site specific soil E&S control plans. These plans should be implemented from the start of site preparation through the completion of site stabilization. A separate contractor should be employed to oversee the implementation of the E&S control plan and inspection and maintenance of control measures. This will minimize wetland and watercourse habitat and water quality degradation.

WILDLIFE CONSIDERATIONS

Introduction

Wildlife habitat is the complex of vegetative and physical characteristics that provide for all the requirements of wildlife, including food, 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. In general, the study area provides good wildlife habitat. Areas with wetlands provide more habitat diversity and are probably utilized by more species.

A wide variety of wildlife utilizes the study area 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, beaver, otter, fox, coyote, hawks, owls, catbirds, sparrows, juncos, chickadees and a variety of reptiles and amphibians. Appendix C contains a listing of all the potential species that could utilize the study area.

General Comments

As with any development, the impact on wildlife habitat in general will be negative and long-lasting. A sizeable area will be broken-up and lost with the construction of roads, driveways, walkways, parking areas and homes. 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 less tolerant species from the study area, even in areas where there has been no physical change. The value of an area for wildlife habitat correspondingly decreases as the amount of development in the area increases.

Each subdivision considered separately represents a significant change in the current wildlife habitat due to the proposed densities. When all 3 subdivisions are considered together, the negative impacts to wildlife habitat is greatly increased.

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 will either move away or perish.

Development layout typically takes 2 forms, single-family homes built on individual lots or clustered homes or cluster developments. Cluster development is often the most preferable (if density is not greatly increased) for wildlife habitat, because it tends to leave a more contiguous and larger area of land as open space. Individual homes on lots fragment or cut-up land with houses and driveways. Small lot sizes tend to augment the negative impacts of development of wildlife habitat. Larger lot sizes of 5 acres or more, especially if used in conjunction with open spaces, can be less detrimental.

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 existing wetlands should be protected from sedimentation. Sediment deposition in a wetland can degrade the habitat and markedly change the value of that wetland for wildlife. Wetlands should not receive runoff water of questionable quality that could contain lawn fertilizers and oils and salts from roads.

Detention basins should not be excavated in wetlands. This usually degrades the wildlife habitat. If detention basins are proposed for detention of water by berming, every effort should be made to ensure that the wetland is not degraded by sediments and polluted water.

If detention basins are proposed adjacent to wetlands or in uplands, an effort should be made to construct them to serve as wildlife habitat. A basin planted with facultative wetland vegetation with standing water is more valuable than a grassed-in basin that holds water only temporarily. Maintaining water in a detention basin should not come at the expense of drying out any naturally occurring wetland.

Maintaining detention basins and storm drains after installation is extremely important, and provisions should be made. If maintenance is not performed on a routine basis, sediment is not trapped before it enters the wetland, and habitat degradation occurs.

Wetlands require protection after development as well as before. Activities such as pasturing animals in a wetland or filling them in for extra lawn and/or garden space should be restricted. Additionally, a buffer of 100 feet of undisturbed vegetation around a wetland can preserve the usefulness of a wetland after the area has been developed.

Open Space Areas

Ideally, a combination of habitat types should be set aside to preserve some of an area's value to wildlife. Setting aside a combination of habitat types in conjunction

with wetlands is most preferable. 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 throughout the subdivision and with open space areas outside of the subdivision site. There should be natural travel pathways (i.e., streams, valleys and ridgetops) for wildlife 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 movement of wildlife.

The 3 subdivisions represent a major land use change and impact on wildlife habitat. Providing for a combination of habitat types, connected throughout the study area will maintain some useful wildlife habitat. This should be done in conjunction with 100-foot buffer strips along all brooks and watercourses.

Ways to Minimize Some Development Effects

In planning and constructing a subdivision, there are measures that should be considered to minimize adverse impacts on wildlife (see Appendix D). Despite these measures, wildlife habitat will increasingly be aversely impacted as the amount of development increases.

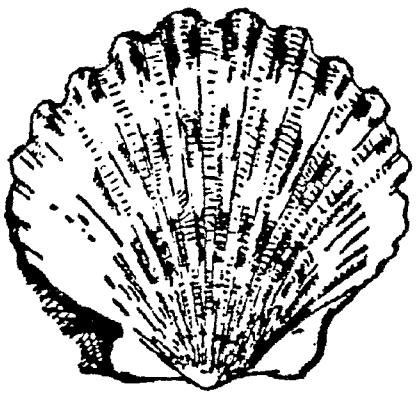
THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

According to the Natural Diversity Data Base, there are no known extant populations of Connecticut "Species of Special Concern" or Federal Endangered and Threatened Species occurring at the study area.

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.

ARCHAEOLOGICAL RESOURCES



ARCHAEOLOGICAL RESOURCES

Findings indicate a moderate to low sensitivity to archaeological resources. A review of the State of Connecticut Archaeological Site Files and Maps shows no prehistoric Indian sites in the study area. However, 2 rock outcroppings with small overhangs were located on the Southwoods Subdivision property on the east side of Newberry Brook. These natural features were often used by Indians for shelter and encampments. Therefore, the possibility does exist for 2 small campsites. If these rock formations are not to be disturbed, then no further action is necessary. However, if blasting or filling these features is proposed, the Office of State Archaeology requests permission to conduct test excavations in the near future. Historical stonewalls run along portions of Newberry Brook. These stonewalls should be maintained, when feasible.

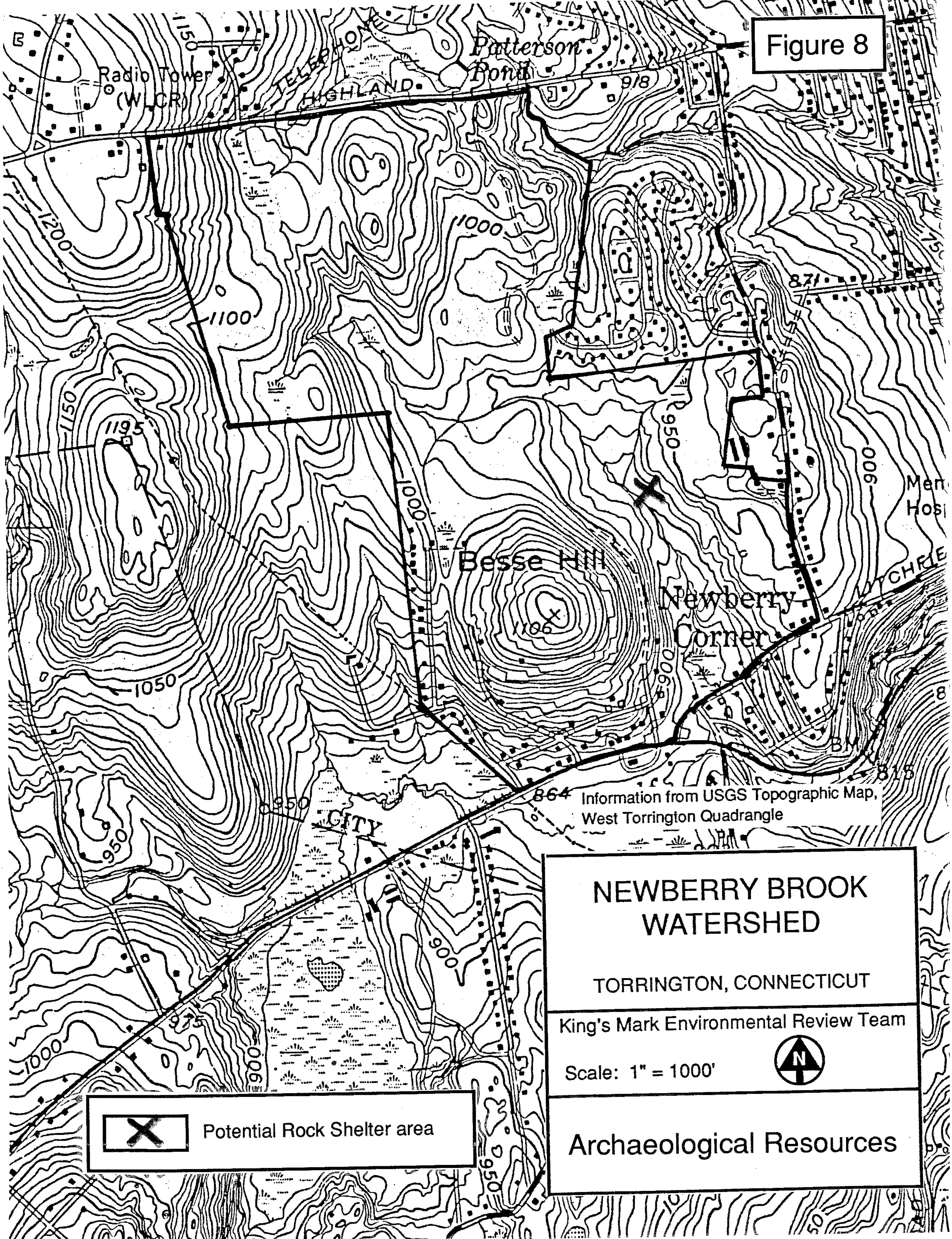


Figure 8
Patterson Pond
Radio Tower (WLCR)
HIGHLAND
Besse Hill
Newberry Corner
CITY
1200
1150
1100
1050
1000
950
900
1195
1106
918
871
864
Information from USGS Topographic Map, West Torrington Quadrangle
NEWBERRY BROOK WATERSHED
TORRINGTON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 1000'
N
Archaeological Resources
Potential Rock Shelter area

LAND USE AND PLANNING CONSIDERATIONS

PLANNING CONSIDERATIONS

Zoning and Surrounding Land Uses

Existing zoning within the study area consists of 3 separate classifications. The Newberry Brook Subdivision site is zoned RRC (restricted residential community) where up to 6 dwelling units per acre are allowed by special permit. Elsewhere, the study area is zoned R15 which requires minimum lot sizes of 15,000 square feet and R10 which requires minimum lot sizes of 10,000 square feet. Smaller lot sizes are possible in the R10 and R15 zones under the City of Torrington's cluster zoning provisions, where a modified lot area requirement of 7,500 square feet is permissible. The recently adopted Torrington City Plan update calls for maintaining the existing RRC zone in the study area and zoning the remainder of the area R15. Land use in the vicinity consists predominantly of undeveloped woodland, with some farmland and moderate to low density residential development.

Consistency of Project with State, Regional and Local Plans

The State Policies Plan for the Conservation and Development of Connecticut 1987-1992 is a statement of the growth, resource management and public investment policies of the State. The State Plan was prepared by the Office of Policy and Management (OPM) and adopted by the Connecticut General Assembly in 1987. The objective of the plan is to give a balanced response to human, environmental and economical needs in a manner which best suits the future of Connecticut. Regional planning organizations and local governments have been encouraged by OPM to foster implementation of the State Plan at the local level.

According to the Locational Guide Map that accompanies the State Plan, the vast majority of the study area has been classified as an area of long-term urban potential. Therefore, it is considered suitable for intensive development, provided sufficient urban facilities and infrastructure are developed or available.

The Litchfield Hills Council of Elected Officials (LHCEO) is the official regional planning organization for the Litchfield Hills Region which includes the City of Torrington. The LHCEO has adopted a preliminary housing policy which, among other objectives, encourages housing which retains community character, preserves environmentally sensitive areas, promotes the provision of meaningful open space and recreation areas and specifically encourages the development of more affordable housing.

The new Torrington City Plan calls for the protection of the environmental quality of the City. An objective established in the City Plan is to: "maintain a balance between the use of land and the need to preserve, conserve, and protect the area's natural resources and open spaces." The City Plan specifically encourages the clustering of development to preserve environmentally sensitive areas and open space and to foster the provision of affordable housing. The City Plan also establishes as an objective the preservation of open space within a subdivision, re-subdivision or RRC zone. The linking of open spaces in adjoining projects is specifically endorsed. The City Plan also calls for maintaining the existing RRC zone in the study area and zoning the remainder of the area to R15, which will provide for a somewhat lower density of development than is permitted under existing zoning in this portion of the City.

Open Space and Recreation Considerations

A report entitled "Community Facilities and Services" was prepared by a consultant in 1987 as part of the City Plan update process. According to the report, Torrington has fewer tennis courts, softball fields and pools than suggested by generally accepted standards and is deficient in playground distribution. The report specifically identifies the southwest portion of the City (i.e., the Newberry Brook Watershed) as in need of such facilities. As stated in the report, while larger parks can be located at a distance from the users, since these generally cater to older age

groups, it is generally accepted that to adequately serve the younger age groups, there should be a playground within not more than 1/2 mile of every residence. The report further states that the facilities should be adequately furnished with well-planned, well-constructed equipment kept in good condition through a regular maintenance program.

The Planning and Zoning Commission recently adopted an open space exaction in their Subdivision Regulations that includes:

1) In subdivisions where the proposed density is less than or equal to 1 dwelling unit per 45,000 square feet, at least 7.5% of the area shall be set aside for permanent open space or recreation; and

2) In subdivisions where the proposed density is greater than 1 dwelling unit per 45,000 square feet at least 10% of the area shall be set aside for permanent open space or recreation.

The regulations also provide that no more than 20% of the open space or recreation area shall be classified as wetland-type soil, be subject to easements or utilities or other purposes unrelated to recreation or preservation of open space or have slopes greater than 15%. The Commission may also require a developer to clear and grade land that has been set aside to make it suitable for recreation.

Torrington's subdivision regulations for recreation and open space are more progressive than many communities in the State. Prudent use of the provisions will assure that future residential development in the area will adequately provide for long-term recreational and open space needs. With the development of the study area, consideration should specifically be given to the creation of several neighborhood parks with routine maintenance of the land and facilities the responsibility of a homeowner's association. The judicious use of clustering can protect meaningful areas of open space in the study area.

DEVELOPMENT SITES

SOUTHWOODS SUBDIVISION

General Project Overview

Southwoods Subdivision is located northeast of Besse Hill and northwest of Newberry Corner. The 36-acre site is proposed to be subdivided into 68 lots ranging in size from 9,000 square feet to 44,000 square feet. The site contains hardwood forest, a portion of Newberry Brook and its associated wetlands, intermittent watercourses and deciduous type wetlands (palustrine forested wetland). There are 2 intermittent watercourses that empty into the wetland located in the central portion of the site. The irregularly shaped parcel is hilly, with moderate to steeply sloping areas in the west-southwest. The Soils Report prepared by Environmental Resource Associates identifies the majority of the wetlands as the poorly drained Leicester Variant soils (Lv). A stretch of wetlands along Newberry Brook has been mapped as Rumney fine sandy loam (Ru).

Erosion and Sediment Control

1) The temporary sediment basin should be omitted on Lots 55, 56 and 57. It is likely to do more harm than good due to land clearing and disturbance close to the wetland and Newberry Brook. A sediment barrier should be installed below construction on Lots 56 and 57 and joined to the barrier proposed for Lot 55. A temporary sediment basin could be built in the proposed road above Lots 55, 56 and 57.

2) Additional Sediment Barriers are recommended:

    a) Below house/driveway construction on Lots 47-53 above proposed plantings;

    b) Below lot grading on Lots 10-12;

    c) Between Lot 42 grading and the wetland;

    d) Below lot grading on Lot 38;

    e) Between the road grading and the wetland between wetland flags #140 and #145;

f) On both sides of the proposed road entrance off Wyoming Avenue near Brammer and Butts property;

g) Below timber wall construction and house construction on Lot 68 to protect the Butts property and Rubenoff property;

h) Below lot grading on Lots 58-67;

i) Along the disturbed area for pipe installation on Lots 51, 52, 53 and 57 and the inlet and outlet to Detention Basin 3;

j) Below lot grading on Lots 23-25 and Lots 28-32; and

k) Around catch basins during land grading so that catch basins do not function until the land is adequately stabilized, except where those catch basins empty into a sediment basin.

3) Sediment barriers are recommended to be moved:

a) Closer to construction, decreasing the clearing on Lots 58-67 (the narrative says that sediment barriers mark the edge of proposed disturbance);

b) Closer to lot grading on Lot 30 to reduce the amount of clearing proposed;

c) Closer to construction with less proposed land clearing on Lots 43-46; and

d) Above the open space between the road grading and wetland, that exists between Lots 42 and 43.

4) The sediment basin adjacent to Lot 20 is recommended to remain as a permanent structure for open water/aquatic vegetation habitat. If this structure is permanent, it should have a wildlife planting plan and a maintenance plan.

5) Extensive regrading of the land is proposed where the watercourse flows into Detention Basin 3. It is unclear whether the timber walls will protect the streamcourse or if it will be disturbed. If it is disturbed, it should be stabilized with rock or another type of structure.

6) The areas where mulch will be applied after seeding should be shown on the site plans. Any cut or fill slopes steeper than 3:1 and longer than 30 feet should be stabilized with an erosion control mat instead of mulch.

Figure 9 Southwoods Proposed Site Plan

Stormwater Management

The DEP does not recommend the use of inland wetlands as stormwater detention areas. This stormwater management system uses inland wetland areas.

The wildlife plantings proposed for the site as a mitigation measure are adequate. A statement should be prepared by the applicant describing and evaluating alternative detention basin locations in upland soils. If no alternative sites exist, or if more environmental damage will be done by using upland sites, then the reasons should be documented for placing the detention basin in the wetlands.

The alternative of moving lot lines above proposed mitigation plantings on Lots 48-53 should be investigated. Having a homeowner association or other group in charge of maintaining these plantings rather than individuals may be beneficial.

The roadside waterway shown on Lots 1 and 2 may outlet on the Arsego property. The design should be clarified to determine if water is being handled properly.

The drainage calculations prepared by Loureiro Engineering February, 1989 should be clarified. No before/after comparison is evident for Detention Basins 1 and 2. It is unclear how the peak outflow from these basins were chosen. It is also unclear why the existing flows are not the same in all columns on the first design sheet for Detention Basin 3. It is recommended that an engineer review these calculations for the City.

Wetland Considerations

Wetland and Watercourse Evaluation: The approximately 6.5 acres of wetlands on the site are part of a larger wetland complex comprised of hardwood forested wetlands, scrub/shrub swamps, emergent marshes, open waterbodies and permanent and intermittent watercourses. Therefore the impacts to the wetland resources on this site will affect the broad scope of functions that the wetland system in its entirety provide.

Wetlands are known to perform many valuable functions in their undisturbed state, including flood protection, water quality renovation, sediment filtration and wildlife habitat. Wetlands also provide recreational, educational and aesthetic values. The wetlands on the site provide all of these functions at varying degrees.

As water enters the site from the east, it flows through several wetland areas via intermittent streams and ultimately into Newberry Brook. Newberry Brook drains into Gulf Stream. As water enters the wetlands, pollutants are filtered by the combination of soils and vegetation. Therefore, wetlands play an important role in maintaining the water quality in Newberry Brook which is described as "very good" by Michael S. Klein of Environmental Planning Services. This pollution abatement function is increasingly important upon the introduction of impervious surfaces to the site (i.e., paved roads, driveways, rooftops, patios, etc.). When impervious surfaces are constructed, less water penetrates into the ground, resulting in an increase in the rate of surface water runoff. Additionally, the pollutants which accompany subdivision development, including fertilizers (for lawns and gardens), oils and greases (from automobile traffic) and sand and salt (from winter road maintenance), may enter the wetlands via surface runoff or ground penetration. Erosion from land surfaces, resulting from the removal of vegetation cover, may result in sediment reaching watercourses and waterbodies. This may have detrimental effects on waters downstream by inhibiting aquatic life and generally degrading the water quality. The increase in the amount and types of pollutants entering a wetland may ultimately outweigh the wetland's ability to provide adequate filtration over an extended period of time, resulting in the pollution of Newberry Brook.

Wetlands in their undisturbed state act as storage basins during periods of heavy rainfall or snowmelt. As surface runoff increases, the poorly drained and very

poorly drained soils in these wetlands have the ability to slow and detain surface runoff, alleviating the danger of downstream flooding.

The wetland system on the site provides good quality habitat for wildlife. Refer to the report titled "Wetland Evaluation and Impact Assessment, Southwoods Subdivision, Torrington, CT" prepared by Environmental Planning Services for a complete inventory of the species occupying the site.

Forested wetlands are important to wildlife because they offer a stable habitat. In times of drought, surface water may generally be obtained by animals in wetlands. In times of windy winter cold, forested wetlands provide windless refuges, producing seeds and fruits for food. Additionally, forested wetlands are often warmer than open areas because of the close proximity of unfrozen and often flowing surface water and springs combined with the windbreaking ability of the trees. Therefore, forested wetlands offer insurance for survival to animals in times of climatic extremes.

The wetlands on the site are connected to other wetlands by watercourses and are more valuable to wildlife because the streambelts are travel corridors to other wetlands.

Project Impacts to Regulated Areas: There are 2 detention basins proposed within the wetlands. The detention basins will not require any excavation. They will be built by the placement of several berms proposed to be constructed both within the wetlands and adjacent to the wetlands. The wetlands will collect and store much of the water from the developed site in Detention Basins 1 and 2. The letter report dated February 13, 1990 titled "Storm Water Detention System for Southwoods Subdivision Wyoming Avenue, Torrington, Connecticut LEA Comm No. 77602" indicates that the detention time for a 100-year storm event is less than 12 hours with a water depth of approximately 11 inches. However, there is no information given concerning how long the wetlands will remain inundated during the 2-, 5-, 10- or 50-year, 24-hour

storms. While a 12-hour inundation period may not significantly affect the vegetation, a longer detention time may. Without the information on the other storm frequencies, the potential negative impacts cannot be determined. Also, alternatives to the proposed design exist that will decrease impacts to the wetlands. Reducing the number of house lots and providing for detention on the uplands should be evaluated.

The information received was submitted to Steve Derby, Principal Civil Engineer, for analysis of the proposed drainage system. The following information was absent from the design report:

1) Pre- and post-development curve number calculation sheets;

2) Pre- and post-development time of concentration calculations;

3) Pre-, post- without detention and post- with detention runoff comparison charts;

4) More accurate stage storage data for each of the proposed detention basins (the assumption of vertical sided basins is not acceptable); and

5) Stage discharge data for each detention basin (each basin must be able to safely pass the 100-year frequency flood).

Additional comments regarding the project include:

1) The outflow from Detention Basin 1 is directed into the street drainage system and away from the wetland located between Lots 42 and 43. This will reduce the natural drainage to the wetland.

2) Detention Basins 1 and 2 will be created by placing low berms across an existing wetland system. An additional berm will be placed across a narrow neck of this wetland (north of Lot 19), creating a distinct separation of the 2 basins. This berm will alter the natural drainage patterns of this wetland system.

3) Lots 47-51 crowd Detention Basin 3.

4) Lots 47 and 48 are particularly ill-suited for development. They are too close to the inflow channels from Detention Basins 1 and 2, and the majority of the yard areas will be below the impoundment area of Detention Basin 3.

5) Detention Basin 3 should be included with the open space areas of this project. Individual lot lines should not extend below the 100-year frequency water surface elevation of the basin.

In general, the major impacts to regulated areas are associated with the proposed stormwater management system. The inundation period of the wetlands, the alteration of the natural drainage patterns by the creation of berms and directing outflow into the street drainage system and the proximity of some of the lots to the detention basins should be addressed by the applicant prior to wetland approval. The potential for erosion into the wetlands along Newberry Brook should also be addressed because the proposed fill slopes are very close to the wetland boundary.

Wildlife Considerations

Description of Area/Habitats: Much of the site is covered by second growth mixed deciduous hardwoods characterized by ash, maple, beech, birch and various other species. Forested areas provide nesting sites, shelter and escape cover, denning sites and roosting sites. Forests also provides food in the form of nuts, berries, buds, catkins, etc.

Forests with a well-developed understory or which contain vegetation of varying heights are the most attractive to wildlife, especially songbirds. Some of the site has a well-developed understory, especially in the vicinity of the wetland areas.

The snag trees (dead trees) on the site are a source of insects which serve as food for species, including woodpeckers and chickadees. Den trees or trees with cavities can serve as a nesting or denning place for animals such as squirrels and raccoons.

There are approximately 6.4 acres of wetlands on the site, including a large area of wetlands in the central portion of the site, several intermittent streams and a portion of Newberry Brook. The wetland areas are primarily deciduous tree and shrub wetlands with standing water in places (palustrine forested wetland). The variety of vegetation along with varying amounts of standing water and several

streamcourses provides habitat for many species. These wetlands offer food, cover, nesting, breeding and feeding areas to a variety of wildlife, especially when considered along with the adjacent upland habitat. These areas are especially important to reptile and amphibian species, which require wetlands with standing water as part of their habitat.

Detention Basins: There are 3 detention basins are proposed for the site. These detention basins are proposed to be built in and adjacent to the wetlands. Wetland habitat is limited in quantity and is extremely important to a variety of wildlife. Using wetlands for detention purposes tends to degrade the wildlife habitat. Placing detention basins in upland habitat is preferred because wetland habitat will be conserved.

Detention Basins 1 and 2 are to be placed in the central wetlands. It has been estimated that 1 inch or less of water will be detained in this wetland during the 25-year storm. This is probably not enough water coming in for a long enough period to drastically change vegetation and therefore current habitat. The quality of water coming into the wetlands must be considered. Stormwater may contain sediments, road salts and other impurities and, if allowed to enter into the wetlands, may degrade wetlands over a period of time.

Detention Basin 3, because of its proximity to Newberry Brook, requires careful consideration. Newberry Brook provides excellent forested stream habitat (upper perennial riverine wetland) at present. Degrading the water quality of the brook will affect the food chain and possibly the vegetation and should be avoided.

Construction of the berms will represent a wetland disturbance at least in the short-term.

Roads: Roads crossing over wetlands represent a negative impact to wetlands. Often times they de-water a side of the wetland and change the wildlife habitat. Roads also are a barrier to some wildlife species, including reptiles and amphibians.

Small populations of these species often live in a particular area, and the ability to travel a short distance is important to their survival.

Stream Corridors/Wetland Buffers: Streams are used as travel corridors for many species of wildlife. Ideally, a buffer of undisturbed vegetation should be left all along the stream corridor. A minimum of 100 feet of undisturbed vegetation left along a stream or wetland is recommended to maintain the usefulness of wetlands for wildlife.

Development Design: The design of this development, which contains many small lots, will augment the negative impacts to wildlife habitat. The site will be broken-up with the construction of roads, houses, driveways, lawns, etc. Approximately 10 acres has been proposed for open space, most of it wetlands. Ideally, areas left as open space should contain a variety of habitats, not just wetlands. If possible, they should be connected, not cut off from each another by roads and houselots.

Planning Considerations

Consideration should be given to including a small neighborhood playground as part of the subdivision to accommodate the recreation needs of future residents. Maintenance of the recreation area could become the responsibility of a homeowners association.

Consideration should be given to incorporating passive solar design principles in the construction of homes. Those units with a direct southern exposure along the roof line are particularly suitable for solar design.

Due to the size of the proposed subdivision, consideration should be given to setting aside a certain percentage of the proposed units for permanent below market value housing. This technique is known as inclusionary zoning and represents an important opportunity to meet the affordable housing needs of the area over the long-

term. The applicant is encouraged to discuss this opportunity with the local community land trust.

The site plan dated February 1990 showed no sidewalks. At the proposed density of development, consideration should be given to providing sidewalks to facilitate convenient and safe pedestrian movement within the subdivision.

Provisions should be made for the maintenance of the proposed landscape plantings. In addition, consideration should be given to planting conifers that are at least 5 feet high rather than the 2.5 feet proposed under the plan. Spacing these plantings 6-8 feet off-center will provide a more effective screen than the 16 feet off-center proposed under the current plan. Since roadside trees are so vitally important to the aesthetics of any neighborhood, removal of trees along the roadside should be absolutely minimized with project implementation. Planting new or replacement trees every 30 feet along side roads is encouraged to reinforce the character of the neighborhood.

NEWBERRY BROOK SUBDIVISION

General Project Overview

Located south of Highland Avenue and to the north of Besse Hill, the proposed Newberry Brook Subdivision consists of 214 housing units along with a small commercial development on 159 acres. Plans also include an area of land to be set aside as a possible site for a new school. Newberry Brook runs through the western half of the site, while Birney Brook borders the site on the east.

Erosion and Sediment Control

No E&S control plan currently exists for this site. Once a plan is developed, the City can request that the Litchfield County Soil and Water Conservation District review the plan. E&S control is critical to the site due to the density of construction, steep slopes and proximity to wetlands and watercourses. Road and lot grading plans should be part of the E&S plan. All E&S measures should be planned and installed by the phases shown. Each successive phase should not be started until the ground is stabilized in the previous phase.

Stormwater Management

No stormwater management plan has been submitted for review. The site plan shows 4 conceptual locations for stormwater detention basins. These locations are not well-suited because they are all in inland wetland areas. Alternative site locations should be investigated and described for the Commission. Detention basins should not be located in perennial streams. A minimum 25-foot maintenance area is needed around any detention basin as well as adequate access to the basin.

Wetland Protection

The soil scientist who flagged the wetlands should certify that the soils map is substantially correct. Once this is done, the inland wetland outline should be

transferred correctly onto the site plans. The current transfer is not accurate. There is an isolated wetland missing on Lots 40-41. These lots should be reconsidered.

These changes are recommended, if feasible:

1) Move the east entrance of Heights Drive out of the wetland finger (toward Lot 43).

2) Move the southern section of Heights Drive out of the wetland (toward Lots 104, 106 and 108).

3) Move the southern access to the commercial site out of the wetland (into Lot 167).

Wetland Considerations

Wetland Functions: The regulated areas present on the site include forested swamp systems, scrub/shrub swamps, open waterbodies and major streamcourses. They are part of a large wetland complex within the Newberry Brook Watershed. The wetland and watercourse impacts associated with this subdivision are numerous and include extensive filling for road crossings, the construction of detention basins within wetland boundaries and streamcourse alterations. The functions of the wetlands on the site are similar to the functions provided by the wetlands and watercourses on the adjacent Southwoods Subdivision site.

Project Impacts: The proposed subdivision includes 214 lots. Although the lot placement has been concentrated outside of the wetlands, wetland impacts will result from the proposed placement of roadways and detention basins and the discharge of stormwater into the wetlands. Many of the road crossings could be eliminated by reducing the number of lots and realigning the roads, perhaps acquiring zoning variances if necessary. Lots 163-166 are surrounded on 4 sides by regulated wetlands and on 2 sides by stream corridors. Eliminating those lots will eliminate 2 wetland/watercourse crossings. Access to the northwest corner could be

Figure 10 Newberry Proposed Site Plan

provided alternatively. An alternative to the boulevard crossing to access Lots 189-214 should be evaluated.

The placement of a detention basin within a stream corridor is unadvisable due to the potential for severe erosion into the stream as well as degradation of existing wildlife habitat.

The commercial portion of this subdivision also entails considerable filling and construction activity within wetlands to gain access to the area.

In general, the site may be suitable for 1 or possibly 2 of the proposed uses. However, the scope of the 3 proposed activities may exceed the reasonable use of this site. General comments for this subdivision include:

1) The density and close proximity of the lots to the streambelt have the potential to cause severe degradation to the wetland/watercourse systems on the site. The density could be reduced, and the layout could be redesigned to reduce the extent of filling necessary to accommodate lots.

2) The direct discharge of stormwater into wetlands and watercourses poses a threat to the functions that they provide. Excessive amounts of sediments and other pollutants may enter wetlands and reduce the quality of these important areas.

3) The Wetlands Commission should require that the applicant provide alternative designs to the current proposal, along with a discussion of why each alternative was considered and why or why not each is feasible and prudent (this includes alternative lot layouts, alternative road configurations and alternative detention areas). Connecticut General Statutes 22a-41(b) requires that in the case of an application which receives a public hearing, a permit shall not be issued unless the Commission finds that a feasible and prudent alternative does not exist. This means that the Wetlands Commission should not issue a permit if a feasible and prudent alternative exists, and it is the responsibility of the applicant to provide alternative designs for the Commission to consider.

4) The excavation of wetlands for the construction of detention ponds should be discouraged. Wetlands, in their undisturbed state, provide natural retention and pollution attenuation functions, if they are not overtaxed.

5) Section 22a-41(a)(6) of the Connecticut General Statutes requires that the Commission consider "the suitability of such activity to the area for which it is proposed." Considering the natural resources involved and the extent of development and proposed development in other areas of this Watershed,

the site may not be suitable for the types and density of the proposed subdivision.

The Wetlands Commission should seek alternatives to the present design of the subdivision and discourage the use of wetlands for stormwater detention.

Wildlife Considerations

Description of Area/Habitats: The site contains a variety of habitats, including mixed hardwood forest, wetlands, brooks and several openings that are reverting to shrubs and trees. The site contains a diversity of habitats and provides good to excellent wildlife habitat.

A majority of the site is covered by forest, containing various oaks, maples, ash, hickory, red maple and hophornbeam, with various viburnums, witch hazel and sweet pepper bush in the understory. A well-developed understory is quite thick in places and provides abundant cover for wildlife. This forested area provides much of the same habitat as the Southwoods Subdivision site.

There are several areas of early successional stage vegetation on this site, containing grasses and herbaceous plant, shrubs and small trees. Because of their vegetational diversity, these areas provide abundant food and cover to a variety of wildlife.

The open field areas offer habitat for mammals such as mice, voles and moles and nesting and feeding areas for birds such as meadowlarks and grouse. Aerial predators often use field areas for hunting.

The site contains approximately 37 acres of wetlands, including Newberry Brook, Birney Brook and various deciduous tree and shrub wetlands (palustrine forested wetland). These wetland areas increase this site's usefulness to wildlife.

There are 4 detention basins proposed to be located in wetlands. Specifics of detention basin construction were not available at the time of the field review. Placing excavated detention basins in wetlands greatly degrades the wildlife habitat

and is not advocated. Using the wetlands as a detention basin by berming has less impact, if the increase in water levels does not impact the wetland vegetation and the water going into the wetland is not of undesirable quality. Any water entering the wetlands should be of good quality. Water containing road salts, lawn fertilizers, oils, etc., from lawns and roads is highly undesirable.

There are 12 wetland crossings proposed for the subdivision. Road crossings have a great impact on wetlands because of the necessary filling, addition of culverts and because they break-up the wetland corridor areas and isolate them from each other.

Design of the Development: The design of this development serves to augment the negative impact of development to wildlife habitat. With the exception of the open space wetland sites, the entire area will be broken-up with house, roads, driveways and lawns. Little area will be left for wildlife habitat, except for those species that are highly adaptable to man's presence. Much of the wetlands on-site will be set aside as open space. Because these areas are being set aside as isolated wetlands set apart by roads and houses, their value to wildlife will be severely limited. There has been no provision for including different habitat types in the open space scheme. Although the school site is proposed to have open space, it will be of little value as wildlife habitat because it will probably be used as recreational fields. Discontinuous open spaces are of minimal value because they represent islands of habitat and are not connected to other areas of habitat. To provide a better wildlife corridor and recreation trail system, the open space parcels should be connected through the area of Lots 61 and 63 and between Lots 95 and 132. The regulated setback area should be kept as open space along with the wetland to leave a buffer between yards and wetlands, to provide an area for upland wildlife habitat and to provide an area which might be used as a perimeter walking trail for passive recreation.

Planning Considerations

A landscaped buffer is required under RRC regulations. The planting plan for this buffer should be submitted as part of the plan together with provisions for maintaining the plantings. Generally, a mixture of indigenous evergreen and deciduous shrubs and trees is appropriate and provides an effective visual screen. The buffer strip will soften the transition between the proposed subdivision and adjacent land uses.

The applicant should address the desirability and feasibility of providing access to the proposed subdivision from the south off Linton Street.

Consideration should be given to including at least 1 playground or neighborhood pocket parks throughout the subdivision to accommodate the recreation needs of future residents. Maintenance of the recreation areas could become a responsibility of the homeowners association.

Consideration should be given to incorporating passive solar design principles in the construction of the homes. Those units with a direct southern exposure along the roof line are particularly suitable for solar design.

Due to the magnitude of the proposed subdivision, consideration should be given to setting aside a certain percentage of the proposed units for permanent below market value housing. This technique is known as inclusionary zoning and represents an important opportunity to meet the affordable housing needs of the area over the long-term. The applicant is encouraged to discuss this opportunity with the local community land trust.

BESSE HILL SUBDIVISION

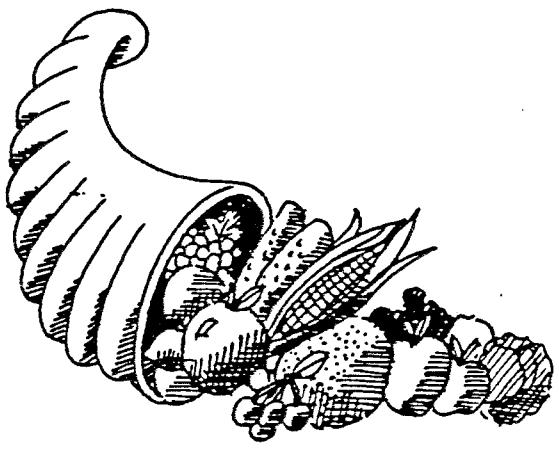
Besse Hill Subdivision encompasses approximately 55 acres. The site is located on top of Besse Hill. Some of the area is quite steep. The habitat is composed of hardwood forest and includes sugar maple, white birch, cherry, red maple and aspen. There are a few scattered white pines. Species composition indicates that this area was more open not long ago (30-50 years), and there is evidence of some old house sites. There are small thickets of trees, shrubs and vines that have grown in where trees have fallen down and/or the disturbance has been more recent. These areas respond to the increased sunlight that is able to reach the forest floor and allow for shrub and vine growth which provide an abundant supply of both food and cover for mammals and birds.

This area of forest land provides much the same wildlife habitat values as the Southwoods Subdivision site.

Although the site contains no wetlands as defined by soil type, it was evident by the erosion of the road that the water does collect in seasonal rivelets and runs off the hill. Continued erosion degrades wildlife habitat, especially if allowed to reach the stream below.

Because of the small lot sizes (5,000 square feet to 6 acres), the development represents a significant negative impact to the site's wildlife habitat.

APPENDICIES



Appendix A: Soil Limitations Chart

TABLE 1: SOIL SYMBOLS AND MAPPING UNIT NAMES

Soil Symbol	Soil Mapping Unit Name
Bk	Borrow and fill land, coarse
GaB	Gloucester sandy loam, 3-8% slopes
GaC	Gloucester sandy loam, 8-15% slopes
GaD	Gloucester sandy loam, 15-25% slopes
GbB	Gloucester stony sandy loam, 3-8% slopes
GbC	Gloucester stony sandy loam, 8-15% slopes
GbD	Gloucester stony sandy loam, 15-25% slopes
GeC	Gloucester very stony sandy loam, 3-15% slopes
GeE	Gloucester very stony sandy loam, 15-35% slopes
Lg	Leicester, Ridgebury and Whitman very stony fine sandy loams
PbA	Paxton fine sandy loam, 0-3% slopes
PbB	Paxton fine sandy loam, 3-8% slopes
PbB2	Paxton fine sandy loam, 3-8% slopes, eroded
PbC	Paxton fine sandy loam, 8-15% slopes
PbC2	Paxton fine sandy loam, 8-15% slopes, eroded
PbD	Paxton fine sandy loam, 15-25% slopes
PbD2	Paxton fine sandy loam, 15-25% slopes, eroded
PbE	Paxton fine sandy loam, 25-35% slopes
PdB	Paxton stony fine sandy loam, 3-8% slopes
PdC	Paxton stony fine sandy loam, 8-15% slopes
PdD	Paxton stony fine sandy loam, 15-25% slopes
PeA	Paxton very stony fine sandy loam, 0-3% slopes
PeC	Paxton very stony fine sandy loam, 3-15% slopes
PeD	Paxton very stony fine sandy loam, 15-35% slopes
Ru	Rumney fine sandy loam
Sb	Saco silt loam
SkC	Shapleigh very rocky sandy loam, 3-15% slopes
SwB	Sutton stony fine sandy loam, 3-8% slopes
SxC	Sutton very stony fine sandy loam, 3-15% slopes
WxA	Woodbridge fine sandy loam, 0-3% slopes
WxB	Woodbridge fine sandy loam, 3-8% slopes

Soil Symbol	Soil Mapping Unit Name
WxC	Woodbridge fine sandy loam, 8-15% slopes
WyA	Woodbridge stony fine sandy loam, 0-3% slopes
WyB	Woodbridge stony fine sandy loam, 3-8% slopes
WyC	Woodbridge stony fine sandy loam, 8-15% slopes
WzA	Woodbridge very stony fine sandy loam, 0-3% slopes
WzC	Woodbridge very stony fine sandy loam, 3-15% slopes

TABLE 2: SOIL CHARACTERISTICS IMPORTANT TO DEVELOPMENT

Soil Symbol	Permeability (in/hr)	K	Corrosivity to Steel	Corrosivity to Concrete	Flooding	Water Table Depth (ft)	Water Table Kind	High Water Months	Depth to Rock (in)	Frost Action
Bk	--	0	--	--	--	--	--	--	--	--
GaB	6.0-20	0.24	low	high	none	>6.0	---	---	>60	low
GaC	6.0-20	0.24	low	high	none	>6.0	---	---	>60	low
GaD	6.0-20	0.24	low	high	none	>6.0	---	---	>60	low
GbB	6.0-20	0.17	low	high	none	>6.0	---	---	>60	low
GbC	6.0-20	0.17	low	high	none	>6.0	---	---	>60	low
GbD	6.0-20	0.17	low	high	none	>6.0	---	---	>60	low
GeC	6.0-20	0.17	low	high	none	>6.0	---	---	>60	low
GeE	6.0-20	0.17	low	high	none	>6.0	---	---	>60	low
Lg	0.6-6.0	0.20	low	high	none	0-1.5	apparent	Nov-May	>60	high
PbA	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PbB	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PbB2	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PbC	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PbC2	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PbD	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PbD2	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PbE	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PdB	0.6-6.0	0.20	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PdC	0.6-6.0	0.20	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PdD	0.6-6.0	0.20	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PeA	0.6-6.0	0.20	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PeC	0.6-6.0	0.20	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
PeD	0.6-6.0	0.20	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod
Ru	0.6-6.0	0.20	high	high	freq	0-1.5	apparent	Sep-Jun	>60	high
Sb	0.6-2.0	0.49	low	mod	freq	0-0.5	apparent	Sep-Jun	>60	high
SkC	0.6-6.0	0.17	low	high	none	>6.0	--	--	10-20	mod
SwB	0.6-6.0	0.20	low	high	none	1.5-2.5	apparent	Nov-Apr	>60	high

Soil Symbol	Permeability (in/hr)	K	Corrosivity to Steel	Corrosivity to Concrete	Flooding	Water Table Depth (ft)	Water Table Kind	High Water Months	Depth to Rock (in)	Frost Action
SxC	0.6-6.0	0.20	low	high	none	1.5-2.5	apparent	Nov-Apr	>60	high
WxA	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Nov-May	>60	high
WxB	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Nov-May	>60	high
WxC	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Nov-May	>60	high
WyA	0.6-2.0	0.20	low	mod	none	1.5-2.5	perched	Nov-May	>60	high
WyB	0.6-2.0	0.20	low	mod	none	1.5-2.5	perched	Nov-May	>60	high
WyC	0.6-2.0	0.20	low	mod	none	1.5-2.5	perched	Nov-May	>60	high
WzA	0.6-2.0	0.20	low	mod	none	1.5-2.5	perched	Nov-May	>60	high
WzC	0.6-2.0	0.20	low	mod	none	1.5-2.5	perched	Nov-May	>60	high

--- no data available

K - Erodibility Factor
.10-.24 - Low Erodibility
.28-.37 - Medium Erodibility
.43-.64 - High Erodibility

Flooding Classes
None
Occasional
Common
Frequent

TABLE 3: MAJOR SOIL LIMITATIONS FOR DEVELOPMENT

Soil Symbol	Septic System	Excavations	Dwellings	Basements	Commercial	Roads	Lawns	Fill	Ponds
Bk	--	--	--	--	--	--	--	--	--
GaB	C-3	C-5	B-16	B-16	B-16	B-16	B-17,22	B-16	C-11
GaC	C-3	C-5	C-9,16	B-9,16	C-9	B-9,16	B-9,17,22	B-16	C-11
GaD	C-9,3	C-9,5	C-9	C-9	C-9	C-9	C-9	B-9,16	C-11
GbB	C-3	C-5	B-16	B-16	B-17,9	B-16	B-17,22	B-16	C-11
GbC	C-3	C-5	B-16,9	B-16,9	C-9	B-9,16	B-9,17,22	B-16	C-11
GbD	C-9,3	C-9,5	C-9	C-9	C-9	C-9	C-9	B-9,16	C-11
GeC	C-3	C-5	B-16,9	B-16,9	C-9	B-9,16	B-9,17,22	B-16	C-11
GeE	C-9,3	C-9,5	C-9	C-9	C-9	C-9	C-9	C-9	C-11
Lg	C-2	C-2	C-2	C-2	C-2	C-2,8	C-2	C-2	B-18
PbA	C-6	B-13,2	B-2	B-2	B-2	B-2	A	A	C-11
PbB	C-6	B-13,2	B-2	B-2	B-2,9	B-2,8	A	A	C-11
PbB2	C-6	B-13,2	B-2	B-2	B-2,9	B-2,8	A	A	C-11
PbC	C-6	B-13,2,9	B-2,9	B-2,9	C-9	B-2,9,8	B-9	A	C-11
PbC2	C-6	B-13,2,9	B-2,9	B-2,9	C-9	B-2,9,8	B-9	A	C-11
PbD	C-6,9	C-9	C-9	C-9	C-9	C-9	C-9	B-9	C-11
PbD2	C-6,9	C-9	C-9	C-9	C-9	C-9	C-9	B-9	C-11
PbE	C-6,9	C-9	C-9	C-9	C-9	C-9	C-9	C-9	C-11
PdB	C-6	C-13,2	B-2	B-2	B-2,9	B-2,8	B-16	A	C-11
PdC	C-6	C-13,2,9	B-2,9	B-2,9	C-9	B-2,9,8	B-16,9	A	C-11
PdD	C-6,9	C-9	C-9	C-9	C-9	C-9	C-9	B-9	C-11
PeA	C-6	C-13,2	B-2	B-2	B-2	B-2,8	B-16	A	C-11
PeC	C-6	C-13,2,9	B-2,9	B-2,9	C-9	B-2,9,8	B-16,9	A	C-11
PeD	C-6,9	C-9	C-9	C-9	C-9	C-9	C-9	C-9	C-11
Ru	C-7,2,3	C-5,2	C-7,2	C-7,2	C-7,2	C-2,7,8	C-2,7	C-2	C-5
Sb	C-7,2,3	C-2,5	C-7,2	C-7,2	C-7,2	C-7,2,8	C-7,2	C-2	C-5
SkC	C-15	C-15	C-15	C-15	C-9,15	C-15	C-15	C-23,5	C-11
SwB	C-2	C-2	B-2	C-2	B-2,9	C-8	B-16,2	B-2	B-18
SxC	C-2	C-2	B-2,9	C-2	C-9	C-9,8	B-9,16,2	B-2	B-18
WxA	C-2,6	C-2	B-2	C-2	B-2	C-8	B-2	B-2	C-11

Soil Symbol	Septic System	Excavations	Dwellings	Basements	Commercial	Roads	Lawns	Fill	Ponds
WxB	C-2,6	C-2	B-2	C-2	B-2,9	C-8	B-2	B-2	C-11
WxC	C-2,6	C-2	B-2,9	C-2	C-9	C-8	B-2,9	B-2	C-11
WyA	C-2,6	C-2	B-2	C-2	B-2	C-8	B-16,2	B-2	C-11
WyB	C-2,6	C-2	B-2	C-2	B-2,9	C-8	B-16,2	B-2	C-11
WyC	C-2,6	C-2	B-2,9	C-2	C-9	C-8	B-16,2,9	B-2	C-11
WzA	C-2,6	C-2	B-2	C-2	B-2	C-8	B-16,2	B-2	C-11
WzC	C-2,6	C-2	B-2,9	C-2	C-9	C-8	B-16,2,9	B-2	C-11

--- no data available

Degree of Limitations

A - Soil properties and site features are generally favorable for indicated use, and limitations are easily overcome.

B - Soil properties are not favorable for indicated use, and special planning, design or maintenance is needed.

C - Soil properties or site features are so unfavorable to overcome that special design, increases in cost and possibly increased maintenance are required.

Types of Limitations

1 Seepage	2 Wetness	3 Poor Filter	4 Ponding	5 Banks Cave	6 Slow Perc
7 Flooding	8 Frost Action	9 Slope	10 Low Strength	11 No Water	12 Subsides
13 Dense Layer	14 Humus	15 Shallow Depth	16 Large Stone	17 Small Stone	18 Slow Refill
19 Piping	20 Dam Seepage	21 Erosion	22 Droughty	23 Area Reclaim	

Appendix B: Chapter 4 - Guidelines for Erosion and Sediment Control

Chapter 4

REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL PLANS

Chapter 4 - REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL PLANS

A. DEFINITION OF PLAN

An erosion and sediment control plan is a document which explains and illustrates the measures which will be taken to control erosion and sediment problems on construction sites. The plan has a written portion known as a narrative and an illustrative portion known as a map or site plan.

A plan is defined in PA 83-388 of 1983 as follows:

> Sec. 3 (5) "Soil erosion and sediment control plan" means a scheme that minimizes soil erosion and sedimentation and includes but is not limited to a map and narrative. The map shall show topography, cleared and graded areas, proposed area alterations and the location of and detailed information concerning erosion and sediment measures and facilities. The narrative shall describe the project, the schedule of major activities on the land, the application of conservation practices, design criteria, construction details and the maintenance program for any erosion and sediment control facilities that are installed;"

B. PLAN FORMAT

The soil erosion and sediment control plan should be an integral part of the overall site plan. However, it needs to be consolidated, so it can be separated from the site plan for review and certification.

To facilitate plan review, certification and implementation, and the construction inspection process, the following format is suggested:

1. The information needed for construction should be on the construction drawings and not in the design calculations or background information.

2. The construction drawings should all be the same size sheets.

3. The soil erosion and sediment control measure construction drawings should be a part of the overall construction drawings for the project.

4. The construction details for measures should be shown on a separate sheet from the plan view sheets.

5. The stages of development, sequence of major operations on the land, and maintenance program during construction are in the narrative portion of the plan but also should be on the construction drawings.

6. General information about the project and design calculations should be in the narrative portion with the exception of a small, simple plan.

7. The design calculations should be in the narrative separate from the construction drawings. Design calculations are normally not needed for inspection, but design calculations need to be available in case revisions are necessary during construction.

8. The background information should be in the narrative separate from the construction drawings.

C. PLAN OUTLINE

The plan must include the items required by the law as given above. The items following include those required by the law and other items that should be considered when developing the plan and included in the plan if appropriate.

This plan outline should not be used as a basis for plan approval. It is intended to be of assistance in preparing and approving erosion and sediment control plans, and to be a reminder of major items that usually need to be considered when developing a plan.

1. VICINITY MAP

a. Project location
b. Roads, streets
c. North arrow
d. Scale
e. Major drainageways
f. Major land uses of surrounding areas

2. PROJECT FEATURES

a. Property lines
b. Limit and acreage of development application
c. Limit and acreage of disturbed area
d. North arrow
e. Scale
f. Legend
g. Planned and existing roads and buildings with their location and elevations
h. Land use of surrounding areas
i. Access roads; temporary and permanent

3. NATURAL FEATURES

a. Soils
b. Rock outcrops
c. Seeps, springs
d. Inland and coastal wetlands
e. Floodplains
f. Streams, lakes, ponds, drainageways, dams
g. Existing vegetation
h. Natural features of adjacent areas

4. TOPOGRAPHIC FEATURES

a. Contours; present and planned (normally 2 foot intervals)
b. Areas of cut or fill
c. Planned grades and slope steepness

5. DRAINAGE SYSTEM

a. Existing and planned drainage pattern
b. Existing and planned drainage area map (include off-site areas that drain through project)
c. Size of drainage areas
d. Size and location of culverts and storm sewers
e. Design calculations and construction details for culverts, storm sewers, etc.
f. Size and locations of existing and planned channels or waterways with design calculations and construction details to control erosion of the channel or waterway
g. Existing peak flows with calculations
h. Planned peak flows with calculations
i. Changes in peak flows
j. Off-site effects of increased peak flows or volumes
k. Measures with design calculations and construction details to control off-site erosion caused by the project
l. Survey and soil information below culverts and storm sewer outlets
m. Measures with design calculations and construction details to control erosion below culverts and storm sewer outlets
n. Measures with design calculations and construction details to control groundwater, i.e. seeps, high water table, etc.

6. UTILITY SYSTEM

a. Location of existing and planned septic systems
b. Location and size of existing and planned sanitary sewers
c. Location of other existing and planned utilities, telephone, electric, gas, etc.

7. CLEARING, GRADING, VEGETATIVE STABILIZATION

a. Areas to be cleared, staging and sequence of clearing
b. Disposal of cleared material
c. Areas to be graded, staging and sequence of grading
d. Areas and acreage to be vegetatively stabilized
e. Planned vegetation with details of plants, seed, mulch, fertilizer, planting dates, etc.
f. Temporary erosion protection of disturbed areas
g. Temporary erosion protection when time of year or weather prohibit establishment of permanent vegetative cover

8. EROSION CONTROL MEASURES

a. Construction drawings and details for temporary and permanent measures
b. Design calculations
c. Maintenance requirements of measures during construction of project
d. Person responsible for maintenance during construction of project
e. Maintenance requirements of permanent measures when project is complete
f. Organization or person responsible for maintenance of permanent measures when project is complete

9. NARRATIVE

a. Nature, purpose and description of project
b. Potentially serious erosion or sediment problems
c. The stages of development if more than one stage is planned
d. The sequence of major operations on the land, such as installation of erosion control measures, clearing, grading, temporary stabilization, road base, road paving, building construction, permanent stabilization, removal of temporary erosion control measures
e. The time required for the major operations identified in the sequence
f. The planned dates for the project. These are often subject to change depending on markets, financing and permit approvals, therefore the sequence of all major operations and time required for major operations is more important in minimizing erosion and sediment problems.

Appendix C: Species List by Habitat for Litchfield County

The following is a list of the **potential** or **possible** species that could occur in the habitat types found on the proposed development sites. The general habitat types include: Deciduous Woodland, Woodland Ectone (area of transition between a woodland and another habitat type such as old field). Old Field, Riverine Upper Perennial Wetland and Palustrine Forest Wetland. These species may use 1 or more of the habitats listed, and they may only use the habitats on an occasional basis, for example during migration or breeding, etc.

CONNECTICUT SPECIES DATABASE
WILDLIFE BUREAU
WESTERN DISTRICT HEADQUARTERS

SPECIES LIST BY HABITAT FOR LITCHFIELD COUNTY

SPECIES	DW	WE	OF	RUP	PFO
Marbled Salamander	X				
Jefferson Salamander	X				X
Blue-spotted Salamander				X	X
Spotted Salamander	X			X	X
Red-spotted Newt	X				
Northern Dusky Salamander				X	X
Slimy Salamander	X				
Four-toed Salamander					X
Northern Spring Salamander	X			X	X
Northern Two-lined Salamander	X				X
Eastern Spadefoot	X		X		
American Toad	X	X	X		
Fowler's Toad	X				X
Northern Spring Peeper	X			X	X
Greater and Lesser Gray Treefrog		X	X		
Wood Frog	X				X
Northern Leopard Frog			X	X	X
Pickerel Frog				X	
Spotted Turtle				X	
Wood Turtle	X	X	X		X
Eastern Box Turtle	X	X	X		X

SPECIES	DW	WE	OF	RUP	PFO
Five-lined Skink	X				
Northern Water Snake				X	
Northern Brown Snake	X	X	X	X	X
Northern Redbelly Snake	X				X
Eastern Garter Snake	X	X	X	X	X
Eastern Ribbon Snake	X	X		X	X
Eastern Hognose Snake	X	X	X		X
Northern Ringneck Snake	X				
Eastern Worm Snake	X		X	X	X
Northern Black Racer	X	X	X		X
Eastern Smooth Green Snake	X		X		X
Black Rat Snake	X	X	X		X
Eastern Milksnake	X	X	X		X
Great Blue Heron				X	
Green-backed Heron (Green)				X	X
Black-crowned Night Heron				X	X
Canada Goose			X		
Wood Duck				X	X
American Black Duck				X	X
Mallard				X	X
Common Merganser				X	
Hooded Merganser					X
Turkey Vulture	X	X	X	X	X
Northern Harrier (Marsh Hawk)				X	X
Sharp-shinned Hawk	X	X	X		
Cooper's Hawk	X	X	X		X
Goshawk	X				
Red-shouldered Hawk	X	X			X
Broad-winged Hawk	X				
Red-tailed Hawk	X	X	X		X
American Kestrel		X	X		
Ring-necked Pheasant			X		
Ruffed Grouse	X		X		
Eastern Wild Turkey			X		
Killdeer			X		
American Woodcock		X	X		
Rock Dove			X		
Mourning Dove	X	X	X		
Black-billed Cuckoo	X	X	X		
Yellow-billed Cuckoo	X	X	X		X
Barn Owl			X		
Screech Owl	X	X	X		
Great Horned Owl	X	X			X
Barred Owl	X				X

SPECIES	DW	WE	OF	RUP	PFO
Long-eared Owl	X		X		X
Northern Saw-whet Owl	X				X
Common Nighthawk			X		
Whip-poor-will	X				
Ruby-throated Hummingbird					X
Belted Kingfisher					X
Red-headed Woodpecker	X	X			X
Downy Woodpecker		X			X
Hairy Woodpecker	X				X
Northern Flicker	X	X	X		
Pileated Woodpecker	X				X
Wood Pewee	X				
Willow Flycatcher		X	X		
Least Flycatcher	X	X	X		
Eastern Phoebe	X	X			
Great Crested Flycatcher	X	X			X
Eastern Kingbird		X	X		
Horned Lark			X		
Tree Swallow					X
Northern Rough-winged Swallow			X		
Cliff Swallow		X			
Blue Jay	X				
Common Crow	X	X			
Common Raven				X	
Black-capped Chickadee	X				X
Tufted Titmouse	X				X
White-breasted Nuthatch	X				
Brown Creeper	X				X
Carolina Wren		X	X		
House Wren		X	X		X
Winter Wren					X
Blue-gray Gnatcatcher	X			X	X
Eastern Bluebird		X	X		
Veery	X				X
Swainson's Thrush	X				
Hermit Thrush		X			X
Wood Thrush	X				X
American Robin	X	X	X		
Golden-crowned Kinglet		X			
Gray Catbird		X			
Northern Mockingbird		X	X		
Brown Thrasher		X	X		
Cedar Waxwing	X				X
European Starling			X		

SPECIES	DW	WE	OF	RUP	PFO
White-eyed Vireo		X	X		
Yellow-throated Vireo	X		X	X	X
Warbling Vireo	X				
Red-eyed Vireo	X				
Blue-winged Warbler		X	X		
Golden Winged Warbler	X		X		
Nashville Warbler	X	X	X		X
Yellow Warbler			X	X	
Chestnut-sided Warbler		X	X		
Magnolia Warbler		X	X		
Black-throated Blue Warbler	X	X			
Yellow-rumped Warbler (Myrtle)		X			
Blackburnian Warbler	X				X
Cerulean Warbler	X			X	
Black-and-white Warbler	X				
American Redstart	X	X		X	
Worm-eating Warbler	X				
Ovenbird	X				
Northern Watertrush					X
Louisiana Waterthrush				X	X
Common Yellowthroat		X	X	X	
Canada Warbler	X			X	X
Yellow-breasted Chat			X		
Scarlet Tanager	X	X			X
Northern Cardinal		X	X		
Rose-breasted Grosbeak		X	X	X	
Indigo Bunting		X	X	X	
Rufous Sided Towhee		X	X		
Chipping Sparrow		X			
Field Sparrow		X	X		
Vesper Sparrow			X		
Savanna Sparrow			X		
Grasshopper Sparrow			X		
Henslow's Sparrow			X		
Song Sparrow			X		
White-throated Sparrow		X	X		
Northern Junco		X	X	X	
Bobolink			X		
Red-winged Blackbird			X		
Eastern Meadowlark			X		
Common Grackle		X	X		
Brown-headed Cowbird	X	X			
Orchard Oriole		X	X		
Northern Oriole (Baltimore)		X	X	X	

SPECIES	DW	WE	OF	RUP	PFO
Purple Finch		X			
House Finch			X		
American Goldfinch		X	X		
Pine Siskin		X			
Virginia Opossum	X			X	X
Masked Shrew	X				X
Water Shrew				X	X
Smoky Shrew	X			X	
Long-tailed Shrew	X				
Short-tailed Shrew	X		X	X	
Least Shrew		X	X		
Hairy-tailed Mole	X	X	X		
Eastern Mole			X		
Star-nosed Mole			X	X	
Snowshoe Hare	X				
European Hare			X		
Eastern Chipmunk		X			
Woodchuck		X	X		
Little Brown Myotis				X	X
Keen's Myotis		X	X		
Silver-haired Bat	X				X
Eastern Pipistrelle	X			X	X
Big Brown Bat	X				
Red Bat	X	X			
Hoary Bat	X				
Eastern Cottontail	X	X	X		X
New England Cottontail	X	X	X		X
Grey Squirrel	X				
Red Squirrel	X				
Southern Flying Squirrel	X				
Beaver				X	
Deer Mouse		X	X		
White-footed Mouse	X	X	X	X	
Boreal Red-backed Mouse	X	X			
Meadow Vole			X	X	X
Woodland Vole	X		X		
Southern Bob Lemming	X		X		
House Mouse		X	X		
Meadow Jumping Mouse		X	X		
Woodland Jumping Mouse	X			X	
Porcupine	X				
Coyote		X	X		
Red Fox		X	X		

SPECIES	DW	WE	OF	RUP	PFO
Gray Fox	X				X
Black Bear	X				X
Raccoon		X	X	X	
Short-tailed Weasel			X		
Long-tailed Weasel		X	X	X	
Mink				X	X
Fisher	X				X
Striped Skunk		X	X		
River Otter				X	X
Bobcat	X	X	X		X
White-tailed Deer	X	X	X		X

Habitat selections for Litchfield County

DW	Deciduous Woodland
WE	Woodland Edge
OF	Old Fields
RUP	Riverine Upper Perennial Wetland
PFO	Palustrine Forested Wetland

Appendix D: Suggestions for Manitaining Wildlife Requirements

SUGGESTIONS FOR MAINTAINING WILDLIFE REQUIREMENTS

1) Maintain a 100 foot (minimum) wide buffer zone of natural vegetation 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 lawn and chemical runoff) to lessen acreage of habitat lost and possible wetland contamination.

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

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

   b) Leave 5 to 7 snag/den trees per acre as 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 and 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 (winterberry). See Appendix E for a list of suggested shrub and tree species that can be encouraged and/or planted to benefit wildlife.

Appendix E: 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.