KING'S MARK ENVIRONMENTAL REVIEW TEAM

REPORT FOR

BAUER PARK PROPERTY

MADISON,
CONNECTICUT

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

BAUER PARK PROPERTY

MADISON, 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

Madison Board of Selectmen

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 Board of Selectmen and the Town. The results of the Team action are oriented toward the development of a better environmental quality and long-term economics of the land use. The opinions contained herein are those of the individual Team members and do not necessarily represent the views of any regulatory agency with which they may be employed.

JULY 1990

ACKNOWLEDGMENTS

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

* William Warzecha, Hydrogeologist
  Department of Environmental Protection - Natural Resource Center
  566-3540

* Patricia Leavenworth, District Conservationist
  USDA - Soil Conservation Service
  269-7509

* Steven Hill, Wildlife Biologist
  Department of Environmental Protection - Eastern District
  295-9523

* Richard Stoecker, Planner
  South Central Regional Council of Governments
  234-7555

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

Finally, special thanks to Gus Horvath, First Selectman, Carolyn Stitl, Selectman, Fred Korsmeyer, Madison Land Conservation Trust, Robert Wigham, Police Commission, Stew MacMillan, Division of Public Works, Robert McDonald, Community Representative, Michael Laws and Henry Ferris, Planning and Zoning Commission, Dianne Idee, MPOA and Erwin Bauer, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The Madison Board of Selectmen requested an environmental review of the Bauer Park Property, a 64.5-acre site recently donated to the Town. The site is located in southern Madison near Interstate 95. The site contains second growth hardwood forest, farmland, several areas of wetlands and 4 farm ponds used for irrigation. Nearby is Hand High School where the Town is considering expanding existing athletic fields. The Town requested a natural resource inventory of the site and land use suggestions. Possible uses include farmland, a nature center, an environmental classroom, athletic fields, affordable housing, a Town building and/or recreational space.

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

Location, Land Use and Zoning

The site is bounded by wooded, undeveloped land, 2 schools and residences. Land use in the area includes agriculture and low density residential uses. The site usage has not changed greatly over the past 56 years, but land use in the area has shown a decrease in agriculture and an increase in residences and wooded land. The site is located in an RU-2 Zoning District.

Topography

The central and western parts are located on the edge of glacial outwash deposits. The topography is characterized by gently rolling hills. The eastern part of the site is controlled by the underlying bedrock. Elevations range from 20 to 50 feet above mean sea level.

Geology

The bedrock underlying the site has been mapped as a subunit of the Middletown Gneiss. The bedrock is covered by till and stratified drift. Texture of the till is generally sandy and loose, and the till is less than 10 feet thick. The stratified drift deposits are found along stream valleys and range from 10 to 70 feet thick in places. Post-glacial swamp deposits overlie the stratified drift on the western parts of the site. Regulated wetland soils parallel the streams. Once the Town has definite plans for the site, the wetlands should be delineated by a soil scientist. The swamp plays an important part in regulating water flow and water quality and could be used for educational trails.

Development Potential from a Geologic Perspective

The opportunities for development vary from place to place on the site. The western parts appear to have good potential for the desired development and agricultural uses, while the eastern parts appear to have some geologic constraints, especially for development of housing. These constraints can be overcome, but may raise the cost of development.

Water Supply

Public water supply mains are not available to the site at present. The sand and gravel deposits and the underlying bedrock should be capable of yielding usable amounts of water to wells. The sand and gravel deposits west of Copse Road may have the potential to yield large amounts of water to wells. A well dug for the high school yields approximately 70 gallons of water per minute. The bedrock is also capable of yielding small to moderate amounts of water to wells. Bedrock wells must intersect water bearing fractures. Wells should be located on the high side of the site, away from sources of pollution such as septic systems and surface drainage and in a direction opposite the groundwater movement. Any housing on the site will probably be served by a community well which requires a permit from the Department of Health Services. The quality of the groundwater should be good. The bedrock may elevate the iron or manganese levels in well water which may require filtration.

Sewage Disposal

Any development on the site will require on-site sewage disposal. Considerable land area in the western portion of the site, excluding wetlands and steep slopes, is favorable for sewage disposal, although percolation rates may be too fast for proper renovation of effluent. Extra protective measures may be needed. In the eastern portion, slopes and wetlands are limitations for septic systems. Soil testing in this area should be conducted to determine the subsurface conditions. The elderly/affordable housing will need a community septic system. A permit will be required from the DEP Water Compliance Unit. The soils on the east side of Copse Road will limit development. Consideration could be given to pumping the sewage across Copse Road to an area where on-site septic systems are favorable.

Hydrology

The site lies entirely within the Neck River drainage area. Approximately 50 acres of the site drains to the unnamed tributary, while the remainder of the site drains south to a wetland and ultimately to the Neck River. Surface water on the site, except the western stream, is Class A. The western stream is Class B/A and is known or inferred to be degraded. Groundwater is Class GA. Every effort should be made to protect the groundwater aquifer on the site because it could be used for future water supply.

Soil Resources

Wetland soils on the site include Scarboro, Walpole, Adrian and Palms and Rippowam soils. These soils should not be drained or filled for development. Walpole and Rippowam soils are important farmland soils. Agawam and Hinckley soils are suitable for many uses. Hinckley soils are droughty and may limit development for playing fields. Septic systems in both soils must be installed carefully because of rapid percolation rates. E&S control is important to insure that wetlands and watercourses are protected. Agawam soils are Prime Farmland soils and are currently used for agriculture. These areas could be used for continued agriculture or community gardens. A Conservation Plan can be developed to insure that the land is properly managed. On the east side of Copse Road, the soils have additional limitations for development, including slope and shallow bedrock.

Wildlife Considerations

Wildlife habitat on the site includes mixed hardwood forest, open/reverting fields and wetlands. The wildlife can be managed through management of habitat. Optimum habitat diversity will maximize wildlife production. Suggestions include managing the wooded portions of the property, maintaining permanent open fields, providing small conifer patches, encouraging certain tree species and placing bluebird boxes at the edges of the fields. Wetlands support many species of wildlife. They are sensitive to development and should be protected from stormwater, vegetation removal and filling. A 100-foot buffer zone will protect wetlands and provide additional upland habitat for wildlife. Fragmentation of upland habitat can affect interior species which require large areas of undisturbed land. In any development, open space areas and wildlife corridors should be identified early. A corridor system for wildlife hooks all the desired habitats into a contiguous system. Guidelines for development planning include using natural landscaping techniques, using a wetland buffer, maintaining forest wildlife requirements and not removing dead and down woody materials. Trails are the key for bringing people and wildlife together. A nature trail with signs can be an educational tool.

Threatened and Endangered Plant and Animal Species

According to the DEP - Natural Diversity Database, there are no Federal Endangered Species or Connecticut "Species of Special Concern" on the site.

Planning Considerations

The site is located in the RU-2 Zoning District. Adjacent land use is low density residences and school property. The eastern part of the site could be developed into a more intensive use, depending on the soil constraints. Test holes should be dug to determine the amount of wetlands, the potential for building and the suitability for septic systems. The eastern portion of the site could be accessed by Copse Road and the unimproved dirt road off of Hunters Trail. The status of the dirt road should be determined by the Town. The remaining parcel could be used for multi-use ballfields, picnic areas, trails and agriculture or community gardens.

Transportation Issues

The site is accessed by Copse Road, a well-maintained, curving road. The traffic generated by recreational uses and elderly/affordable housing should not significantly impact the roads. Most use will occur on off-peak hours. Site lines should be improved by clearing vegetation.

Recreation Planning

The site provides the Town with an opportunity to expand its recreational facilities. Currently, there are not enough practice fields. The western part of the site is an excellent area to build a multi-purpose field, including a 90-foot baseball diamond. One plan for sequencing development on the site is first building the multi-purpose field, parking and trail to the high school, then building picnic areas and nature trails and finally, clustering additional fields around the first.

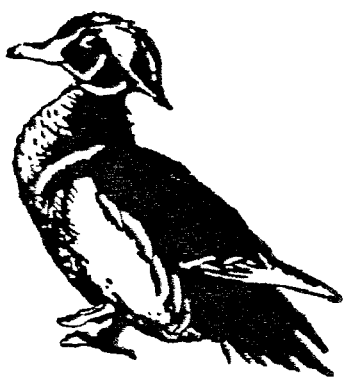
TABLE OF CONTENTS

LAND USE AND PLANNING CONSIDERATIONS

LIST OF APPENDICES

LIST OF FIGURES

INTRODUCTION



INTRODUCTION

The Madison Board of Selectmen has requested an environmental review of the Bauer Park Property, a 64.5-acre site recently donated to the Town. The site is located in southern Madison near Interstate 95. Access is provided by Copse Road.

The site contains second growth hardwood forest, farmland, several areas of wetlands and 4 farm ponds used for irrigation. Nearby is Hand High School where the Town is considering expanding existing athletic fields. The Town is interested in a natural resource inventory of the site and land use suggestions. Possible uses include farmland, a nature center, an environmental classroom, athletic fields, affordable housing, a Town building and recreational space.

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

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

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

3) Discuss soil erosion and sedimentation concerns;

4) Discuss water quality concerns;

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

6) Assess planning, farmland preservation, recreation and land use issues.

THE ERT PROCESS

Through the efforts of the First Selectman 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:

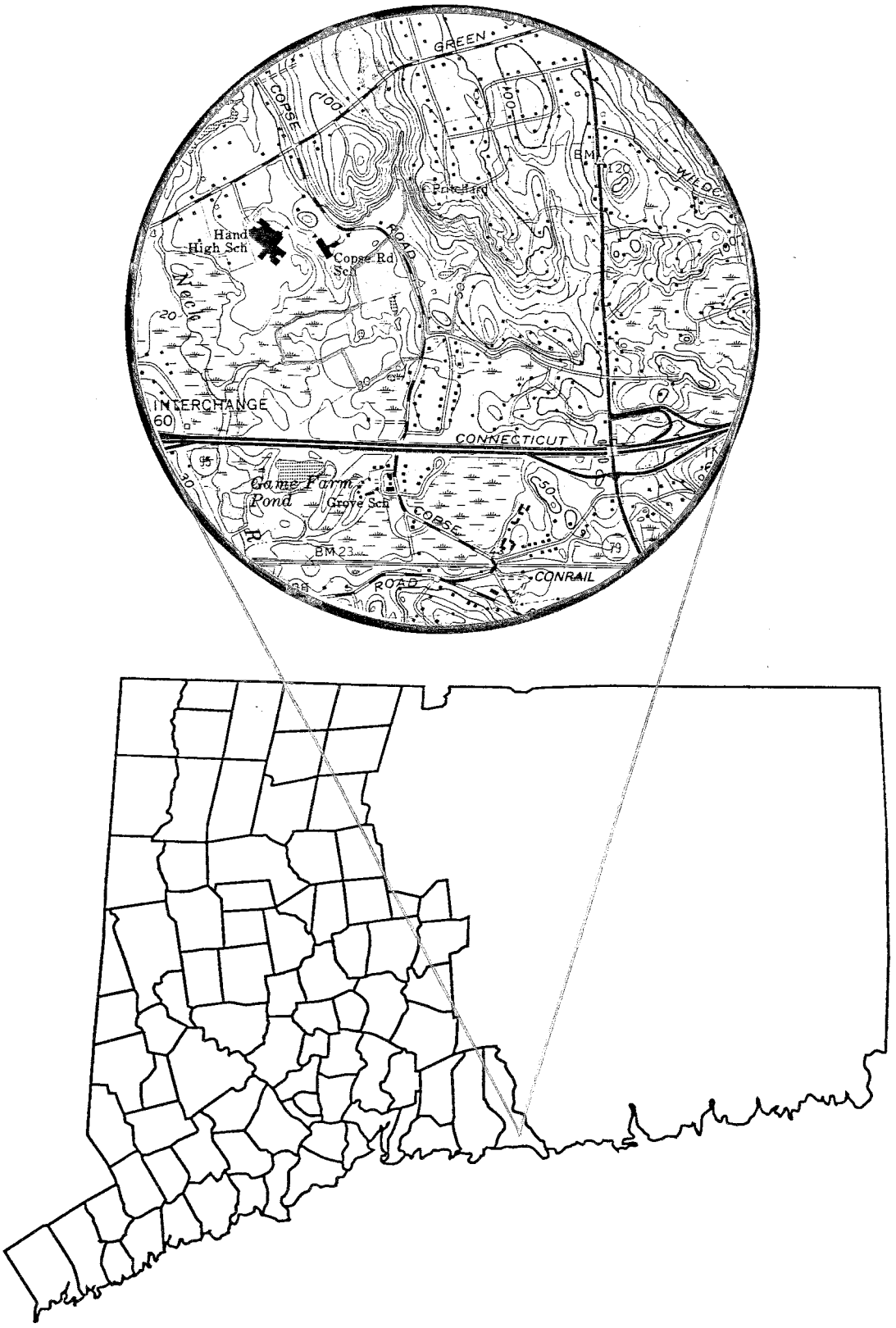
1) Inventory of the site's natural resources (collection of data);
2) Assessment of these resources (analysis of data);
3) Identification of resource problem areas; and
4) Presentation of planning and land use guidelines.

The data collection phase involved both literature and field research. The ERT field review took place on June 13, 1990. Field review and inspection of the site proved to be a most valuable component of this phase. The emphasis of the field review was on the exchange of ideas, concerns or alternatives. Mapped data or technical reports were also perused, and specific information concerning the site was collected. Being on-site also allowed Team members to check and confirm mapped information and identify other resources.

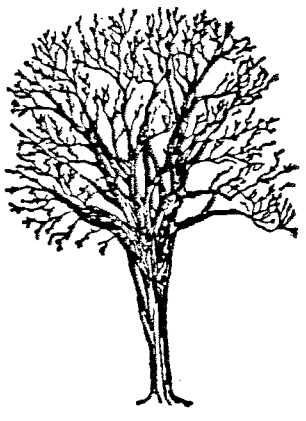
Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. The results of this analysis enabled the Team members to arrive at an informed assessment of the site's natural resource development opportunities and limitations. Individual Team members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

Figure 1

LOCATION OF STUDY SITE



NATURAL RESOURCE CHARACTERISTICS



LOCATION, LAND USE AND ZONING

The Bauer Park Property is located approximately 1.5 miles from the center of Madison and consists of 64.5 acres of active agricultural land and wooded land in southern Madison. The site is bounded on the west and south mainly by wooded, undeveloped land, on the north by Hand High School and Copse Road School properties and on the east by residential properties. Copse Road bisects the east central parts of the site. Based on the site map, approximately 23.5 acres of the site lies east of Copse Road, and approximately 40 acres lies west of the road. From the southern property line, the site lies between 800 and 1,000 feet north of Interstate 95. Of the 64.5 acres, approximately 23% or 15 acres comprise open farm fields. They occur mainly on the west side of Copse Road. A 2.5-acre hay field is located on the east side. Wooded areas occur at the eastern limits and along the northern border.

Land-use in the vicinity of the site consists of medium to high density residential properties, some agricultural land and educational institutions. The 1934 air photo that includes the site and vicinity indicates the land cover on the site has not changed significantly over the past 56 years. In contrast, land-use changes for the vicinity since 1934 include a decrease in agricultural land and an increase in wooded land.

The site is located in a RU-2 Zoning District which allows residential lots that are a minimum of 60,000 square feet (approximately 1.5 acres). Certain agricultural land uses and customary home occupations are also included in this zone. The Town is considering using the site for satellite municipal office buildings, athletic fields, community gardens and/or affordable/elderly housing.

TOPOGRAPHY

The central and western parts of the site (generally west of the 40-foot contour that occurs just east of Copse Road) are located on the eastern periphery of a massive series of glacially deposited outwash materials. The outwash consists mainly of sands and gravels. The surface in this area is characterized by gently rolling hills, including some nearly level areas and steep areas. A small area of steep slopes occurs mainly on the west side of the westernmost farm pond. East of the 40-foot contour, the land surface is controlled largely by the underlying bedrock. The land surface in this area is generally moderately steep and slopes to the unnamed streamcourse that bisects the east central portions of the parcel (see Figure 3). Maximum and minimum elevations on the site are 50 feet above mean sea level and 20 feet above mean sea level, respectively.

GEOLOGY

The site is located entirely in the Clinton topographic quadrangle. A surficial geologic map (QR-28, by R.F. Flint, 1968-69) and a bedrock geologic map (QR-29, L. Lundgren Jr. and R.F. Thurrell, 1969-70) for the quadrangle have been published by the Connecticut Geological and Natural History Survey. The Bedrock Geological Map of Connecticut (John Rodger's, 1985) was also referenced.

Bedrock Geology

A single bedrock exposure is visible in the east central parts. It is visible in the hay field that occurs on the crest of the small knoll which Copse Road traverses over. According to soil mapping data, shallow to bedrock soils occur at the eastern limits of the site. Bedrock underlying the site is classified as a subunit of Middletown Gneiss (see Figure 4). The rock is described as dark to light gray gneiss and granofels,

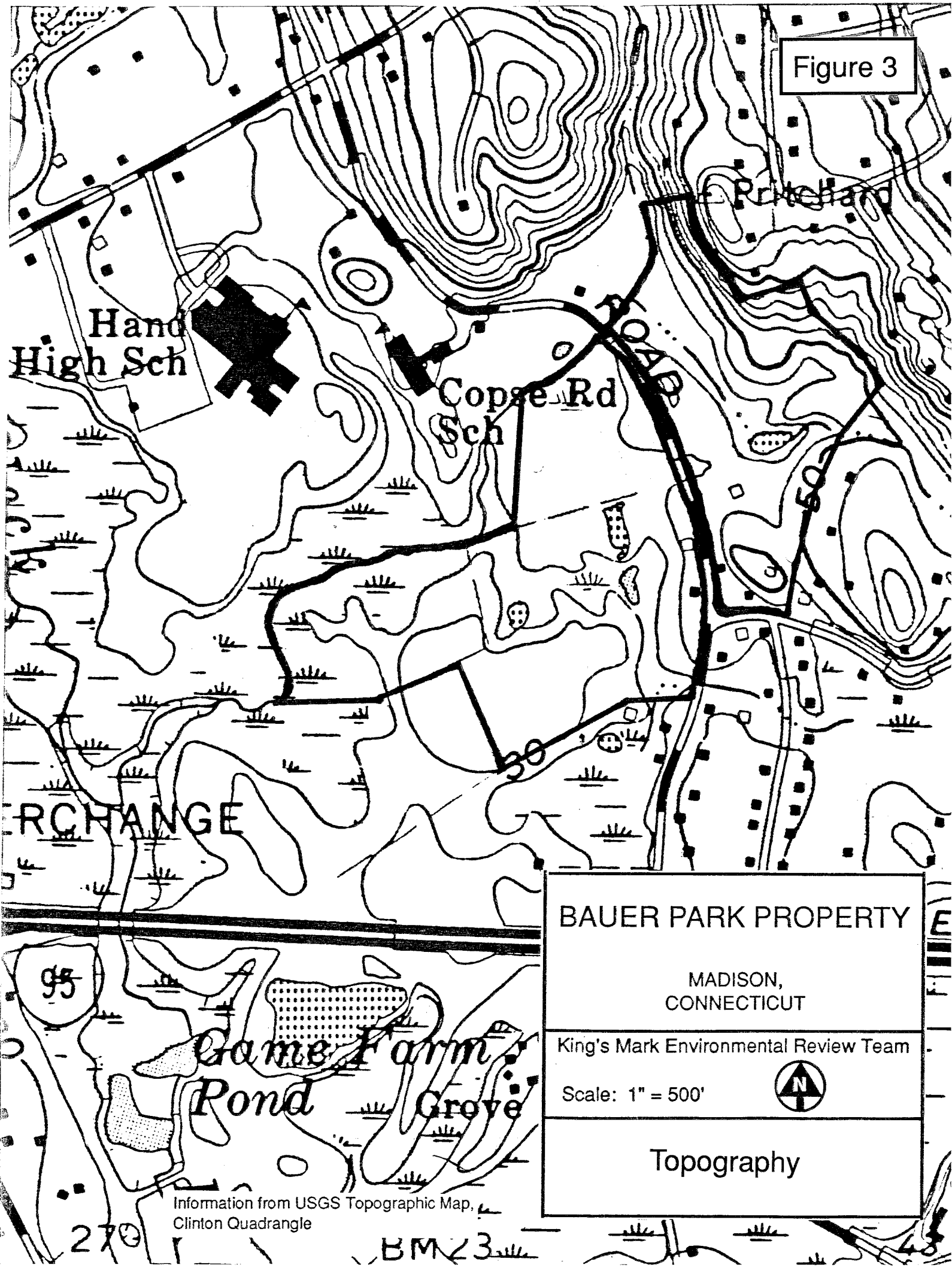


Figure 3
Hand
High Sch
Copse Rd
Sch
Pritchard
50
30
RCHANGE
95
Game Farm
Pond
Grove
BM 23
BAUER PARK PROPERTY
MADISON,
CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
N
Topography
Information from USGS Topographic Map,
Clinton Quadrangle

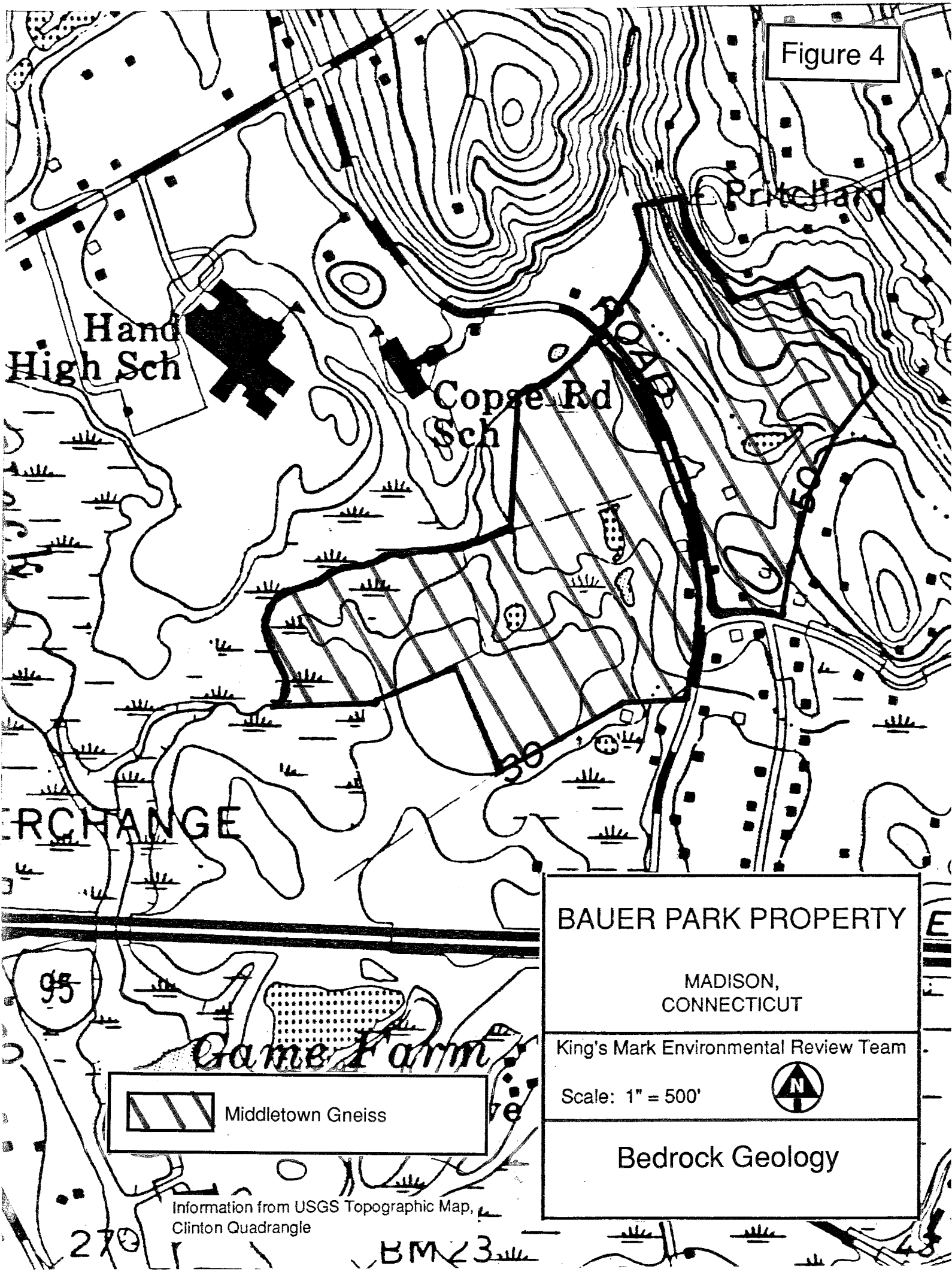


Figure 4
Hand
High Sch
Copse Rd
Sch
ROAD
Prichard
RCHANGE
95
Game Farm
Middletown Gneiss
BAUER PARK PROPERTY
MADISON,
CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
N
Bedrock Geology
Information from USGS Topographic Map,
Clinton Quadrangle

hornblende gneiss and amphibolite. Gneisses, granofels and amphibolites crystalline metamorphic rocks that have been geologically altered by great heat and pressure within the earth's crust. The terms gneiss, granofels and amphibolite refer to the textural and structural aspects of the rocks. Gneisses are recognizable by alternating layers of light and dark minerals that give the rock a banded appearance. Amphibolites are generally dark-colored rocks that contain a high percentage of the minerals plagioclase and amphibolite with little or no quartz. The rock is massive to poorly layered. Granofels is a light- to dark-colored rock that is medium- to coarse-grained. This rock lacks the compositional banding of gneisses. Most homes in Madison that are north of Interstate 95 rely on the underlying bedrock as a source of drinking water (see Water Supply section).

Surficial Geology

Surficial geologic materials are the unconsolidated mineral and organic materials that overlie bedrock. These materials are also called overburden. On the site, 2 types of glacial sediments predominate: till and stratified drift (see Figure 5).

As glacier ice moved through the region, it collected and transported rock particles and pre-existing overburden. Much of this transported debris was redeposited directly from the ice, either by being plastered onto the land from beneath the ice mass or by being let down gently as the ice wasted. The resulting deposit was till. Because of its peculiar origin, till contains a non-sorted mixture of particles, ranging in size from clay to large boulders. The till may be sandy, stony and loose or silty, less stony and tightly compact. Soil mapping data for the site indicates the till is sandy and relatively loose and is probably 10 feet or less in thickness.

When the glacier ice began to melt, it sent forth streams of meltwater, often with torrential flows. These streams were filled with rock debris from the ice and redeposited this debris in well-sorted to poorly-sorted layers. Ice contact deposits (sand, gravel, silt and clay) were near the ice, while outwash (sand and gravel) was

washed further downstream to be laid down in lakes or in the sea. The resulting deposits are collectively known as stratified drift. The thickness of the sand and gravel varies considerably across the site. At the western limits, the stratified drift ranges between 40 and 79 feet thick. In the interior parts, it ranges between 10 and 40 feet. Along the east and west side of Copse Road, the deposit is thin and probably does not exceed 10 feet in most places.

Stratified drift deposits in Connecticut are most commonly found in stream valleys, whereas till covers most of the upland areas. On this site, till occurs in the eastern limits, and outwash covers the remainder of the site.

Post-glacial sediments, comprising swamp deposits, overlie the sand and gravel deposits on the western limits. Regulated wetland soils also parallel the outlet stream for the easternmost farm pond. In general, they consist of silt, sand and clay mixed with organic matter in poorly drained areas. Once development plans materialize, the Town should consider having the regulated wetland areas delineated by a certified soil scientist and superimposed onto a site plan.

The swampy area in the western parts of the site is a small portion of a large wetland area through which the Neck River and some of its tributaries flow. Because of its large size, the swamp has an important role in regulating streamflow. During periods of heavy rainfall or snow melt, the swamp stores surface water temporarily, releasing it slowly and thereby reducing the peak flood flows in the Neck River and other downstream watercourses. The swamp also protects the quality of surface water, both by the dilutive effect of retaining a large undeveloped zone and by the natural biochemical processes that occur in wetlands. Because of its proximity to Hand High School and Copse Road School, the swamp can be used for environmental education purposes.

As a result of the deposition of till and stratified drift and the formation of wetlands on the site, the opportunities for specific developmental activities may vary

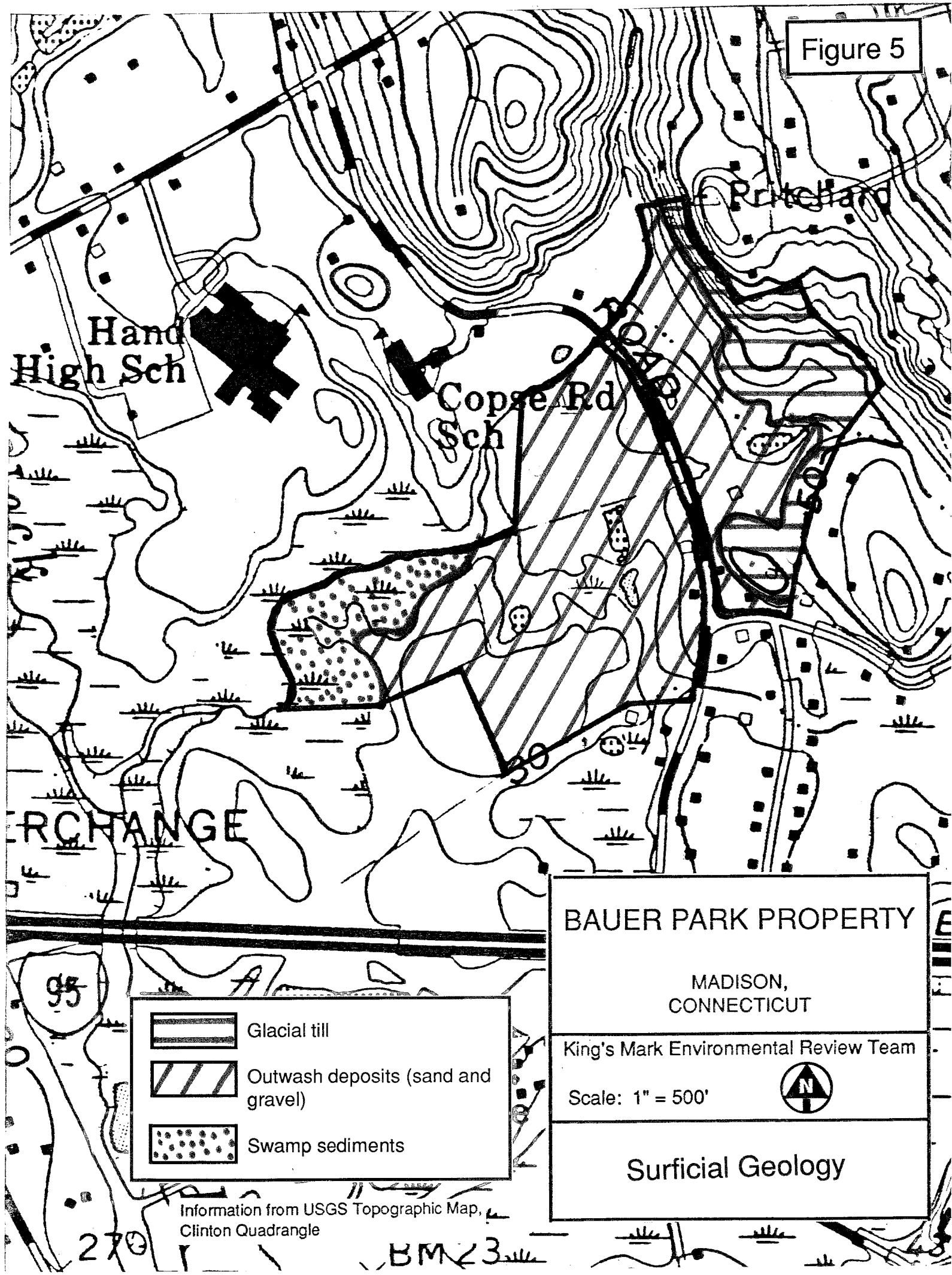


Figure 5
Hand
High Sch
Copse Rd
Sch
Pritchard
ROAD
ERCHANGE
95
30
BM 23
BAUER PARK PROPERTY
MADISON,
CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
N
Surficial Geology
Glacial till
Outwash deposits (sand and gravel)
Swamp sediments
Information from USGS Topographic Map, Clinton Quadrangle

considerably from point to point within the site. West of Copse Road, the parcel appears to have the greatest potential for the land uses presently being considered. Steeper slopes and shallow to bedrock soils are more limiting east of Copse Road and will be the major hindrance for the development of affordable/elderly housing units, especially with regard to on-site sewage disposal.

DEVELOPMENT POTENTIAL FROM A GEOLOGIC PERSPECTIVE

The land west of Copse Road appears to be the most favorable for the desired development purposes. The presence of deep, well-drained soils and flat to gentle slopes are suitable for the construction of athletic fields and municipal buildings (also see Sewage Disposal section). Also, the presence of prime agricultural soils west of Copse Road have been and would be considered ideal for vegetable gardens (community gardens). Nearby surface waterbodies could be used for irrigation purposes. Wetlands, shallow to bedrock soils and some steeply sloping areas will restrict development in some areas of the site east of Copse Road.

While there may be an opportunity to locate some dwellings on the east side of Copse Road, the presence of moderate slopes, possible shallow to bedrock soils and a streamcourse and its accompanying wetlands will restrict its development potential (also see Sewage Disposal section). Engineering design may be able to overcome these restrictions in some cases, but this will raise site development costs.

WATER SUPPLY

Public water supply mains are not available to the site at present. Nevertheless, the sand and gravel deposits, mainly the deposits west of Copse Road, and the

underlying bedrock appear to be capable of supplying usable amounts of water to an on-site well(s).

According to the map entitled Ground Water Availability in Connecticut (D.B. Meade, 1978), the sand and gravel deposits west of Copse Road are relatively thick, are believed to be coarse-grained and are close to a major streamcourse. Given these hydrogeologic conditions, the sand and gravel may have excellent potential for the development of high yielding wells (50 to 2,000 gallons per minute). Further hydrogeologic investigations, including a test well(s), is required to determine the exact aquifer potential of the sand and gravel on the site.

According to a well completion report for a gravel packed irrigation well that serves Hand High School north of the site, the well, drilled in August 1987, reportedly yields 70 gallons per minute and is screened for a distance of 10 feet in medium sand and glacial till. The well is 8 inches in diameter and extends to a depth of 223 feet, of which 173 feet penetrated bedrock. The bedrock section of the well appears to have been backfilled, and the casing in the screened section appears to have been lifted.

The bedrock underlying the site is also a potential source of water for low-yielding or moderate-yielding wells. Bedrock floored wells must tap fractures in the underlying bedrock. The yield of a well tapping the bedrock fracture system depends in part upon the number and size of the water-bearing fractures that the well intersects. Because the fractures are unevenly spaced throughout the rock, there is no practical way, short of expensive geophysical tests, to assess the potential of any specific site for a satisfactory yield. Most bedrock wells are capable of yielding small amounts of water. A survey of bedrock wells in the lower Connecticut River Basin (see Connecticut Water Resource Bulletin No. 31) indicates that more that 80% yielded 3 gallons per minute or more, 50% yielded approximately 7 gallons per minute or more and 10% yielded 18 gallons per minute or more.

If the Town wishes to drill a well or wells on the site, every effort should be made to locate wells on a relatively high portion of the site, properly separated from sources of pollution such as septic systems and surface drainage that might be laden with pesticides and in a direction opposite the expected direction of groundwater movement. All wells must be properly installed in accordance with all applicable State Public Health Code and Connecticut Well Drilling Board regulations to provide adequate protection of the quality of well water. In addition, the Town sanitarian must inspect and approve all well locations.

Affordable/elderly housing will probably be served by a community water supply system. This type of water supply arrangement requires approval by the State Department of Health Services (Public Water Supply Section) and the Department of Public Utilities Control. Information on projected needs of the development in terms of water quantity, water quality testing and plans for pumpage, storage, treatment, if necessary, and the distribution system will be necessary for a community water supply. Consideration should be given in advance to providing for proper operation and maintenance of the community water supply system (i.e., takeover by a private or municipal water supply company).

The natural quality of groundwater should be satisfactory. However, the bedrock (Middletown Gneiss subunit) beneath the site may have elevated levels or iron and/or manganese. In high levels, these minerals could lower the overall quality of the water. There are suitable treatment filters available to ameliorate these potential water quality concerns.

SEWAGE DISPOSAL

Because the Town does not have a municipal sewer system, any development that occurs on the site such as municipal buildings, affordable housing or sanitary

facilities for athletic facilities will be served by on-site subsurface sewage disposal systems. The allowable density level of buildings is a measure by which the Town can better control and prevent or minimize public health problems and protect surface and groundwater resources.

Considering soil and surficial geologic mapping data and observations made during the field review, it appears that considerable land area (excluding wetlands and steeply sloping areas) west of Copse Road are favorable for sewage disposal purposes. Because soils in this area consist of porous, well-drained sand and gravel, there is concern that the soils may not provide for a high degree of filtration and renovation of sewage effluent. Percolation tests must be conducted to determine percolation rates. Additional protection may be required, especially if percolation rates are excessively fast (i.e., faster than 1 minute per inch). These protective measures could include increasing separating distances between wells and septic systems, assuring that casings for wells are properly sealed into the underlying bedrock for bedrock wells and locating the wells on high portions of the site. Normally, a greater horizontal separating distance is necessary where the required yield or withdrawal rate of a well is 10 gallons or more.

Conventional septic systems could be constructed west of Copse Road without problems. East of Copse Road, where the affordable/elderly housing will probably be located, the land is limited by moderate slopes, exposed and/or potentially shallow underlying bedrock and by the unnamed streamcourse and its accompanying wetlands that bisects the northern parts. The streamcourse is the outlet for the pond located in the eastern limits. Soil testing, including a sufficient number of deep test holes, should be conducted in this area to ascertain subsurface conditions. The Town should seek the services of a competent sanitary engineer familiar with Department of Environmental Protection (DEP) regulations regarding community septic systems to conduct this work.

In general, a minimum of 4 feet of original soil should be maintained between the bottom of the leaching system and bedrock. Likewise, at least 18 inches should be maintained above the maximum groundwater level. There should also be adequate lateral separating distance from the top of an embankment and/or watercourse in which the direction of effluent may be moving. Due to the presence of sandy, permeable soils, it may be necessary to increase these distances in some places.

The construction of dwellings for elderly or affordable housing will probably be classified as a community public subsurface sewage disposal system. This type of arrangement will require a permit from the DEP Land Disposal Section of the Water Compliance Unit. Before the DEP could act on a permit application, the Town, through their technical consultant, must provide detailed technical information on the hydrogeologic conditions in the disposal areas, the design of each sewage disposal system, a thorough hydraulic analysis of the disposal areas and analysis of the probable impact on any nearby water resources and the underlying aquifer from a drinking water quality standpoint. This last requirement should include an analysis of bacterial travel, virus removal and nitrate and phosphate transport. The "burden of proof" is on the Town to show that the sewage disposal system(s) will function properly and not pose a threat to public health or the environment. Prior to acting on a permit application, the Town should be prepared to make arrangements for ownership, operation and maintenance of the sewage disposal system. The Town sanitarian will also be actively involved in the permit application, soil testing, review of the plans and inspection of the sewage disposal system(s) during installation.

Soils and site characteristics of the land area east of Copse Road are limited for on-site sewage disposal. Therefore, the Town must consider what is a satisfactory or workable density (number of dwellings) for development within the confines of pertinent regulations and requirements. This can only be determined after the necessary soil testing has been conducted. Densities will probably be low. If soil

testing indicates that sewage disposal is not feasible in the area, consideration may be given to collecting the sewage effluent at a central point east of Copse Road and pumping it to the west side of Copse Road, where subsurface conditions appear to be much more favorable for on-site sewage disposal.

HYDROLOGY

The site lies entirely within the Neck River drainage area. Approximately 50 acres of the site drains to the unnamed Neck River tributary that flows through the western parts of the site (see Figure 6). Its drainage area is approximately 518 acres. Surface drainage along the site's southern border flows into a wetland area situated between the site and Interstate 95 and then flows southward to the Neck River.

There are 4 small surface waterbodies on the site, 3 west of Copse Road and 1 at the eastern limits. All 4 ponds drain to the unnamed watercourse that flows through the western parts of the site and ultimately to the Neck River. Except for the principal watercourse on the site (western parts), surface waters have been classified by the DEP as Class A water resources. Class A water resources may be suitable for drinking, recreational or other uses and may be subject to absolute restrictions in the discharge of pollutants, although certain discharges may be allowed.

The unnamed streamcourse in the western parts is classified by the DEP as a B/A water resource, which indicates that currently the water quality is known or inferred to be degraded. In this case, leachate from a former mixed waste landfill is the source of contamination to the watercourse. B/A water resources are generally suitable for recreational, agricultural or certain industrial uses such as process or cooling water. The State's goal is to improve, through Best Management Practices, the water quality of the watercourse to that of a Class A water resource.

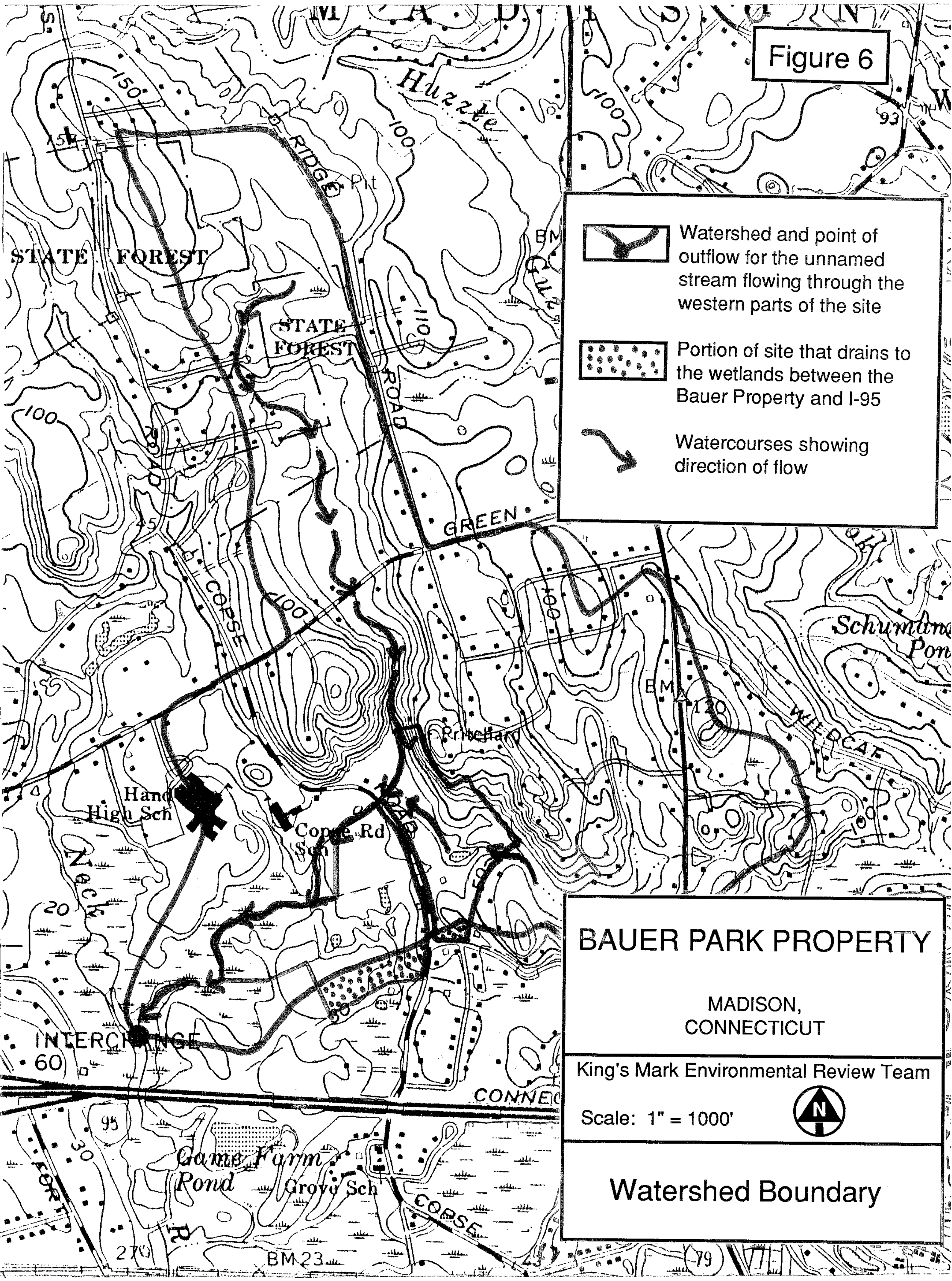


Figure 6
Watershed and point of outflow for the unnamed stream flowing through the western parts of the site
Portion of site that drains to the wetlands between the Bauer Property and I-95
Watercourses showing direction of flow
BAUER PARK PROPERTY
MADISON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 1000'
N
Watershed Boundary
STATE FOREST
STATE FOREST
RIDGE
Pit
ROAD
GREEN
COPSE
ROAD
Hand High Sch
Copse Rd Sch
Pritchard
WILDCAT
Schumann Pond
INTERCHANGE 60
CONNEC
Game Farm Pond
Grove Sch
COPSE
BM 23
Huzzle
Neck

Groundwater beneath the site is classified by the DEP as GA which means that it is suitable for private drinking water supplies without treatment.

Considering of the potential significance of the sand and gravel deposits west of Copse Road for future water supply purposes, every effort should be made to protect the aquifer from too great a volume of septic tank effluent, pesticides and/or fertilizers that may accompany land use activities presently being considered by the Town.

SOIL RESOURCES

Soils on the Bauer Park Property are shown in Figure 7. Map units on the western parcel were updated from the New Haven County Soil Survey by Marc Beroz, SCS Soil Scientist, in the August 1984 ERT Report entitled "Proposed Corporate Office Park Zone." The soil map on the eastern side of the road is taken from the original soil survey. Soils include poorly and very poorly drained materials formed on glacial outwash (sand and gravel deposits) such as Scarboro Muck (Sr), Walpole sandy loam (Wa) and Adrian and Palms Mucks (AA). Along the southeastern watercourse there is an area of Rippowam (formerly Rumney - Ru) fine sandy loam, a soil formed on the lower floodplains of major streams and their tributaries. All of these soils are inland wetland soils and cannot be drained or filled to improve them for more intensive land uses. The Walpole and Rippowam soils are soils of statewide importance as farmland and can be used under certain conditions for farming purposes.

Upland soils formed on the glacial outwash deposits include Agawam fine sandy loams (AfA) and Hinckley gravelly sandy loams (HkB, HkC). These soils, especially the Agawam, are suitable for many uses. The major limitation for the Hinckley map unit is droughtiness. Maintenance of grass cover on playing fields

may be more difficult on this soil type. Conservation and enhancement of soil organic matter can increase this soil's moisture retention capability. Septic systems installed in both the Hinckley and Agawam soils must be carefully designed to avoid contamination of groundwater due to the rapid percolation rate of these soils. There are bedrock outcrops and shallow to bedrock conditions as inclusions in the Hinckley map unit in the northern field along the eastern side of Copse Road. If this area is considered for siting of residential units, test pits should be installed to determine soil conditions for on-site sewage disposal.

Areas best suited for siting of playing fields are the Agawam soils, the Hinckley soils in the far western field and the Hinckley soils along the west side of Copse Road north and south of the house.

Any area which is developed for more intensive use such as playing fields or residential units should have a comprehensive E&S control plan to assure that nearby wetlands and watercourses are protected during and after development. Appendix B contains a checklist which should be used in the design of an E&S control plan.

The Agawam soils are prime farmland soils of nationwide importance. Prime farmland is land best suited for producing food, feed, forage and fiber crops. Hinckley soils have statewide importance for the production of food, feed, fiber and forage crops (see Figure 8). Currently, the entire area of Agawam soils on the site and a field with Hinckley soils along Copse Road are leased to a farm operation in Guilford for vegetable production. Areas of Hinckley soils south of the house along the western side of Copse Road, along the eastern side of Copse Road north of the house and at the far western end of the site are currently in grasses and volunteer old field vegetation.

There is statewide and local commitment to preservation of prime and important agricultural soils. These areas could be set aside for lease to local farmers

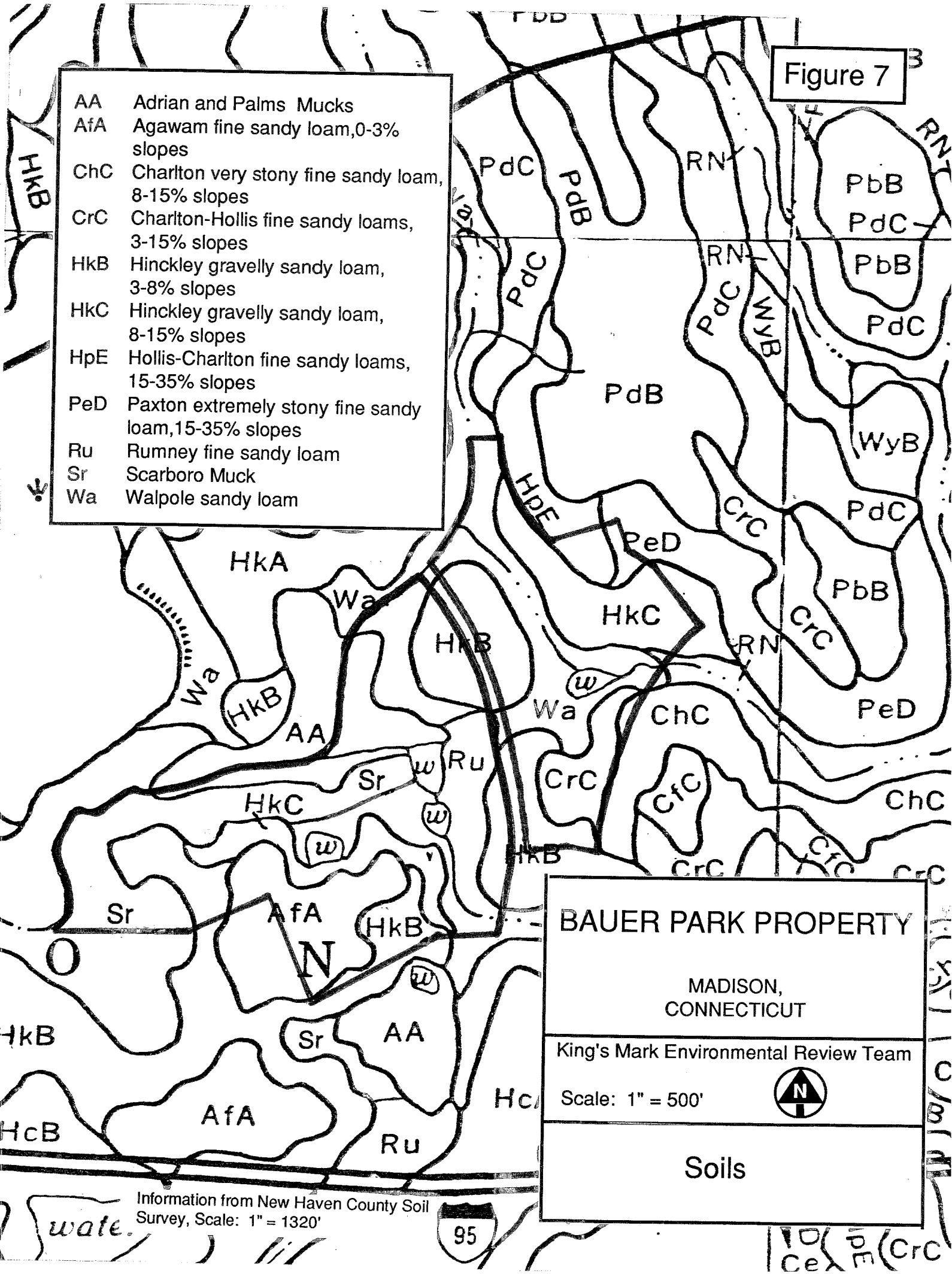


Figure 7
AA Adrian and Palms Mucks
AfA Agawam fine sandy loam,0-3% slopes
ChC Charlton very stony fine sandy loam, 8-15% slopes
CrC Charlton-Hollis fine sandy loams, 3-15% slopes
HkB Hinckley gravelly sandy loam, 3-8% slopes
HkC Hinckley gravelly sandy loam, 8-15% slopes
HpE Hollis-Charlton fine sandy loams, 15-35% slopes
PeD Paxton extremely stony fine sandy loam,15-35% slopes
Ru Rumney fine sandy loam
Sr Scarboro Muck
Wa Walpole sandy loam
BAUER PARK PROPERTY
MADISON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
N
Soils
Information from New Haven County Soil Survey, Scale: 1" = 1320'
95

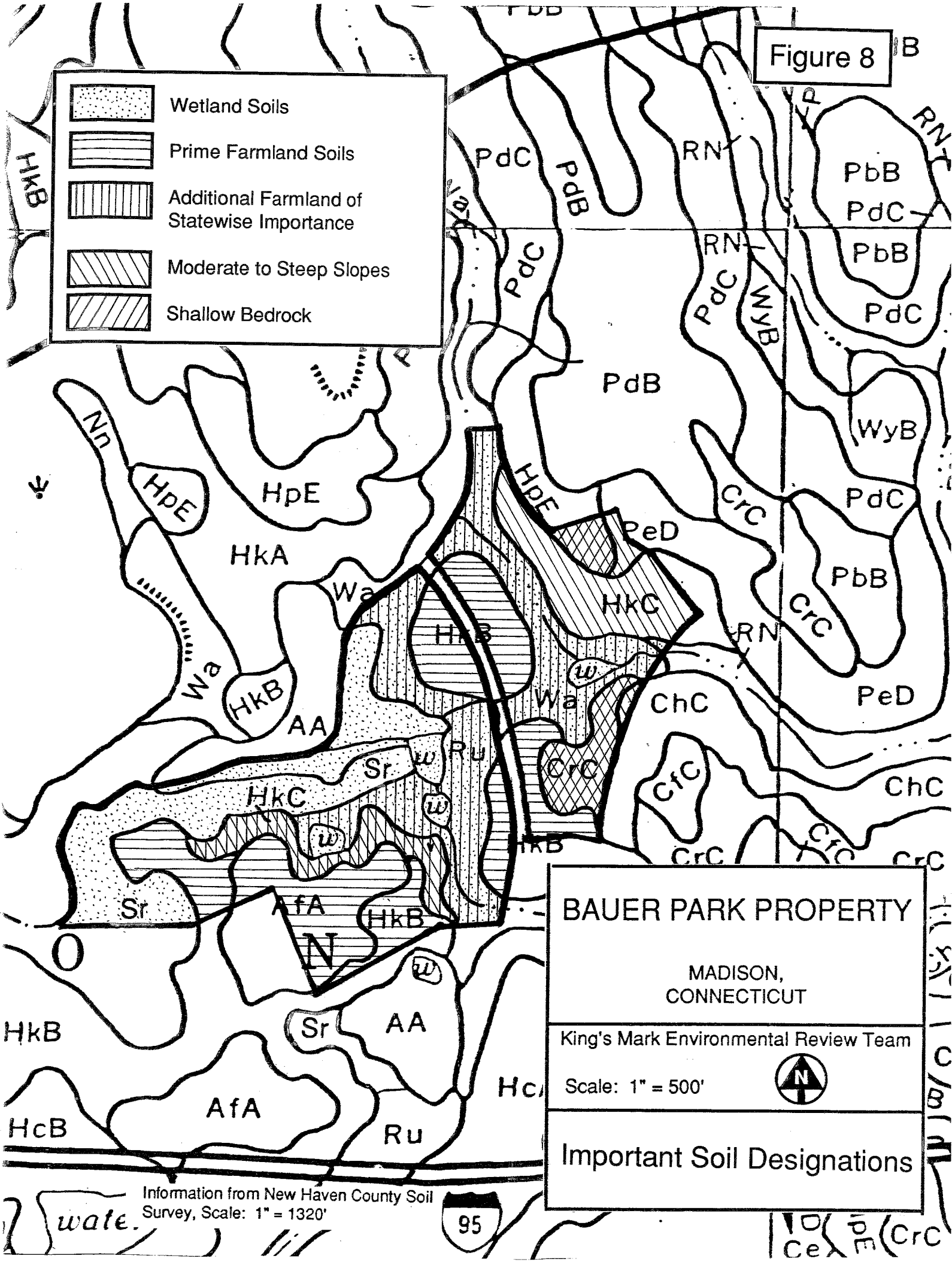


Figure 8
Wetland Soils
Prime Farmland Soils
Additional Farmland of Statewise Importance
Moderate to Steep Slopes
Shallow Bedrock
BAUER PARK PROPERTY
MADISON, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
Important Soil Designations
Information from New Haven County Soil Survey, Scale: 1" = 1320'
95
HkB
PdC
PdB
RN
PbB
WyB
HpE
PeD
HkA
Wa
HkC
CrC
ChC
CfC
AA
Ru
Sr
AfA
HcB
Nn

who are in need of land to grow crops, for use as community gardens or for a Town nursery. This is consistent with the Town's desire to maintain the rural character of Copse Road and the Bauer Park Property itself. The New Haven County Soil and Water Conservation District is available to work with the Town to develop a Conservation Plan for selected agricultural areas on the site to assure that the land is used and managed properly. The Conservation Plan could then be made part of any lease agreement with renters of the land. In selecting areas for agricultural use, consideration should be given to proximity to water for irrigation, access for farm equipment and level to gently sloping land areas.

On the hillside on the eastern side of Copse Road, facing the farmhouse, are Charlton and Charlton-Hollis soils which are bedrock controlled fine sandy loams. The Charlton unit is generally suitable for the siting of septic systems, but has limitations for development of structures due to slope and soil erosion potential. Any development in these areas should be carefully planned to avoid erosion problems. On-site soils investigation should be the first step in preparation of land use plans for this area. The Hollis unit consists of shallow to bedrock soils and is interspersed with Charlton soils. This soil has severe limitations for development.

WILDLIFE CONSIDERATIONS

Habitat Type Descriptions

The habitat types on the site consist of mixed hardwoods, open/reverting fields and wetland/riparian habitat. Typical wildlife species utilizing each habitat type are noted along with potential species in Appendix B.

Mixed Hardwood Forest: This habitat type consists of a variety of hardwood species, including red maple, beech, red oak, elm, hickory, white oak and scattered white pine and cedar. Understory vegetation includes witch hazel, elderberry, multiflora rose, grape, blackberry and hardwood regeneration. Wildlife frequenting this habitat type include deer, fox, raccoon, gray squirrel, woodpeckers (pileated, hairy and downy), ovenbirds, scarlet tanagers, black-throated, blue and green warblers, barred owls, broad-winged hawks and various non-game species such as shrews, voles and snakes.

Wetland/Riparian Habitat: This habitat type consists of various combinations of streams/brooks, open ponds, swamps and small marsh areas. Associated vegetation includes red maple, birch, alder, cattails, dogwood, jewel-weed, spicebush, sweet pepper bush, skunk cabbage, false hellebore, duckweed and various grasses and sedges. Wildlife using these areas include deer, fox, raccoon, skunk, muskrat, mink, swallows, red-winged blackbirds, grackles, kingbirds, cedar waxwings, hooded and Wilson's warblers, titmice, woodpeckers, wood ducks and numerous amphibians and reptiles, including water and garter snakes, salamanders, newts and spotted and painted turtles.

Open Field: Open land habitat is very beneficial to wildlife. Vegetation provides food and structural diversity, creating cover for a great array of wildlife ranging from mice and shrews to deer. Fields also attract numerous insects, a major food item of various wildlife species such as birds and small mammals, including bats.

Another important feature of fields is the edge created where fields meet forest. This valuable zone for food and cover consists of dense berries, shrubs and grasses. Wildlife utilizing open field habitat include deer, woodcock, woodchuck, fox, raccoon, skunk, mourning dove, bluebirds, eastern kingbirds, mockingbirds, flycatchers, blue and golden-winged warblers, robins, kestrels, red-tailed hawks, eastern screech owls and cottontail rabbits.

Wildlife Management Techniques

Management of wildlife resources is in a large part dependent upon habitat management. The manipulation of vegetation is a key element of wildlife management. Sustaining wildlife populations means regulating on a continual basis the kind, amount, and spatial arrangement of food and cover plants to provide for the needs of wildlife.

Wildlife management goals for the site should include production of optimum habitat diversity to maximize production of wildlife species. This can be accomplished by creating and/or maintaining a diversity of food and cover with a mosaic of nesting, resting and loafing sites scattered throughout the area.

Ideal upland/forestland habitats for general wildlife considerations are composed of:

1) Approximately 2 to 3% of the land mass in permanent grass-legume plots;

2) Approximately 5 to 7% of the land mass in permanent openings maintained to encourage early successional stage, native vegetation;

3) Approximately 10% of the land mass in cover species such as young growth conifer patches (1/8 to 2 acres); and

4) Managing the forestland should be a combination of 2 systems:

    a) Roughly 75% of the forestland in even-aged; and

    b) Approximately 25% in uneven-aged stands.

Eventually the management unit will consist of 25% seedling/sapling, 25% poles and 50% saw timber. If these stands are well-mixed, optimum wildlife habitat will result.

Specific guidelines:

1) Pile brush (6 feet by 8 feet high by 10 feet in diameter) along edges of openings to create cover for birds and small mammals.

2) Encourage mast producing trees (i.e., oak, hickory, beech).

3) Leave 3 to 5 snag/den trees per acre for their food and nesting values.

4) Trees with vines (i.e., berry producers) should be encouraged.

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

6) Aspen clumps and apple trees should be released from overcrowding competition.

7) White pine seedlings should be planted within openings and as underplantings to increase the amount and distribution of conifer cover.

8) Early successional stage vegetation is essential to various species of wildlife. Where possible, this habitat type (i.e., agricultural fields, pasture, grass-legume plots, native reverting fields) should be encouraged.

9) Fields should be cut every 1 to 3 years to maintain early successional stage vegetation. Cutting should be scheduled on a staggered basis and not prior to July 1st to avoid disturbing nesting birds. A 15-foot wide border between fields and forestland should be established and maintained on a staggered basis by cutting every 3 to 5 years after July 1st. This 15-foot zone provides an additional edge component to the site.

10) Bluebird boxes should be placed along field edges.

A variety of successional stage vegetation must be encouraged for optimum wildlife habitat potential. Proper maintenance of openings and field borders must be conducted. If neglected, native vegetation will progress to less desirable stages, lowering the wildlife potential on the area.

Impacts of Development

Wetland/Riparian Habitat: Wetlands support a high diversity of wildlife due to the complexity of the vegetative structure, high productivity and abundant food supply which allow for a high carrying capacity (Brown et. al. 1978). There are many species that require access to streams or waterbody margins for survival, even though they may spend much of their time in other habitats (Milligan and Raedeke 1986). Part of the food supply for many vertebrates is the high abundance and diversity of insect populations that are typical of wetland ecosystems (Brown et al. 1978). Wetlands presently provide important habitat for a variety of wildlife species and function as areas for absorption of natural runoff. Any planned diversion of stormwater into wetlands will increase water flow, sedimentation and pollution. This may alter the present ecological structure of the wetland and reduce species diversity. Even though stormwater retention and filtration plans may alleviate some of these problems, the long-term effects of stormwater diversion into wetlands tend to be negative. Retention and filtration systems may still allow fine silt and pollutants to enter. Not only are wetlands important to wildlife, they are also important to humans. Various functions of wetlands include flood control, ecological integrity, fish and wildlife habitat, nutrient and sedimentation trappings, educational potential, visual/aesthetic quality, recreation, groundwater use potential and botanical sites. There are usually inherent limitations in developing wetlands due to poorly drained and unstable soil types.

Vegetation removal in wetlands may have severe impacts on wildlife, especially reptiles and amphibians. Cover, food, breeding habitat and hibernation areas may be altered. Species dependent on specialized habitat are eliminated and more adaptable species are increased in numbers (Campbell 1973). Barriers to seasonal movement and population dispersal such as roads are also serious threats (Campbell 1973). To minimize impact, maintain a 100-foot wide buffer zone of vegetation around

wetland/riparian areas. This buffer zone will filter and trap silt and sediments, provide excellent wildlife cover and be an aesthetic and educational asset to the community.

Upland Wooded Areas: Fragmentation and loss of habitat may lead to a decline in species diversity and richness. Wildlife populations will be reduced in proportion to the amount of habitat lost. Sensitive, interior species that require large tracts of undisturbed forest such as veeries, ovenbirds and scarlet tanagers may move away and no longer occupy the area.

Wildlife Corridors/Open Space

In any proposed development, the delineation of open space/wildlife corridors should be identified early in the planning process. The proper selection of habitats for incorporation into the open space system can make a major difference in the wildlife benefits to be incurred. A variety of habitat types should be retained to increase species diversity. Because it is impractical to retain a large area which includes all the desired habitats, it is logical for an open space system to be based on a network of corridors. A corridor configuration essentially "hooks up"the different habitats into a contiguous system. This system enables wildlife species to utilize the different habitat components as required. The logical base for the wildlife corridor/open space system are the stream/wetland corridors. Woodlands are important to wildlife, and the ecotones formed at wetland and woodland edges provide an additional habitat where a dense understory provides cover and screening from human disturbance. There should also be ancillary corridors that extend from this system into and through the developed area, thereby encouraging the movement of wildlife into and through the developed area.

Mitigation of Disturbances

These management guidelines should be considered during the planning process to minimize adverse impacts on wildlife:

1) Make use of natural landscaping techniques, avoiding and/or minimizing lawns and chemical applications, to lessen acreage of lost habitat and possible wetland contamination.

2) Maintain a 100-foot wide buffer zone of natural vegetation around wetland/riparian areas to filter and trap silt and sediments. These vegetated zones provide excellent wildlife cover and travel corridors.

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

4) During land clearing, care should be taken to maintain certain forestland wildlife requirements:

5) Removal of dead and down woody material should be discouraged, where possible. The existence of many wildlife species (i.e., salamanders, snakes, mice, shrews and insects) depends on the presence of dead trees (Hassinger 1986).

Natural History/Education Trails

Trails are the key to bringing people and wildlife together. Trails should be located to take advantage of terrain and existing habitat and conform to existing landscape textures. Effective trail planning and layout can enhance the learning and aesthetic aspects of outdoor recreation by providing easy access to varied habitats. A nature trail, including informational signs, provides insight into the ecology of an area. The information provided allows the general public to appreciate a particular animal, plant or habitat and its ecological value. Guidelines for developing a trail system include:

1) Know the characteristics of the site and plan the layout so that the trail passes by or through a variety of habitat types.

2) Make sure the trail is safe as well as exciting. If feasible, a portion of the trail system should be made accessible to the handicapped.

3) Follow a closed-loop design, beginning and ending at the same point.

4) Avoid long, straight stretches. Trails with curves and bends are longer, add the elements of surprise and anticipation and seem more natural. Straight stretches should not exceed 100 feet.

The trail system should be well-marked and accompanied by an informational pamphlet. This will allow interested individuals, not just organized groups, to have an educational opportunity. If management practices are conducted (i.e., openings, plantings, bluebird boxes) they should be discussed. The major wildlife topics emphasized should be the value of vegetation types, succession and wetland areas to wildlife.

THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

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

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.

LAND USE AND PLANNING CONSIDERATIONS

PLANNING CONSIDERATIONS

The 64-acre site is located in the RU-2 Zoning District of Madison and is split into 2 distinct parcels by Copse Road. Commercial agriculture, forestry, truck or nursery gardening, including greenhouses on lots 5 acres or more are allowed uses in the RU-2 District. Also, the display and sale of farm and garden produce raised on the premises is allowed. Philanthropic, educational, recreational or religious use by a duly incorporated, non-profit body, governmental unit or community association, excluding correctional institutions and institutions for the insane is allowed in RU-2 Districts by Special Exception. The land use adjacent to the site is low density residential in nature with a wetlands trail link to the abutting Hand High School and Copse Road School properties. A small medium density residential development is located south of Hunters Trail and east of Copse Road. Much of the Bauer Park Property was included in the 1984 ERT Report for Corporate Office Park Zone, involving the nearby Davis Property (Grove School). In the 1988 Madison Plan of Development, the area in which the site is located was designated as the Midlands section, where both the purchase of lands near Hand High School and consideration of planned residential projects were to be encouraged.

The parcel to the east of Copse Road includes 24 acres which could be developed into a more intensive use (i.e., elderly housing), depending upon the building constraints of the soils and the feasibility of the project funding. Present regulations permit density levels for multi-family elderly housing at 12 units per acre. The site is encumbered by a large ledge outcrop and an intermittent stream and associated wetlands. Test holes should be dug on-site to determine the amount of wetlands, suitability for a community septic system, the amount of buildable land and overall site design of the potential housing units and roadways. Also included in the eastern portion is a wooded area, garage and accessory buildings and a small pond. The

eastern site could be accessed by both Copse Road and an unimproved dirt roadway section off of Hunters Trail. The status of the dirt road section should be determined for upgrading it to Town standards. Any elderly housing development on the site should be at a scale and design consistent with the single-family character of the surrounding area.

The remaining area, roughly 40 acres of the parcel, is located to the west of Copse Road and is comprised of farmland fields, 3 manmade ponds used for irrigation and wetland areas which abut Hand High School property. Opportunities exist for the Town to develop multi-use ballfields, picnic areas around the ponds and trails linking high school ballfields traversing the border wetland environment.

The community is no longer an agricultural community. However, some of the land could be set aside for continued agricultural production. The Town could investigate leasing land to local growers, joint experimental programs with Connecticut Agricultural Experiment Stations or the Yale School of Forestry and Environmental Studies, community run tree farming operations or community gardens.

TRANSPORTATION ISSUES

The site is accessed by Copse Road, a well-traveled north-south Town collector. Copse Road is a well-maintained roadway with the characteristic loops and curves of the early cartpath trails. School buses and bulky trash haulers contribute to the daily local traffic along the road. The nearby road network consists of Hunters Trail which connects Copse Road with Route 79, and Green Hill Road, a major east-west artery. Hunters Trail is used by motorists accessing Interstate 95 and has been recently chip sealed to protect the base, but suffers from poor sight lines at the intersection of Route 79. It also is burdened by a dangerous horizontal curve just east

of the unimproved road section of lower Ridge Road. The traffic generated by the recreational uses and elderly housing units presently considered for the site should not create a significant impact on the surrounding roads. Most new usage will probably occur during the off peak hours. Sight lines must be improved by clearing some vegetation along both Hunters Trail and Copse Road. Intersection alignment with Hunters Trail should be considered when designing access points to the main parcel west of Copse Road for future signalization improvements. The Town should seriously consider funding a comprehensive study of the road system and traffic patterns to better address development proposals.

RECREATION PLANNING

The Town of Madison is known for its excellent beach and recreation programs and facilities, particularly the Surf Club grounds. The site provides the Town with an opportunity to create additional recreational facilities for the residents for years to come. The 1988 Madison Plan of Development recommended preparing an Open Space and Recreation Plan. This plan should be a cooperative effort of the Inland Wetlands Agency, the Planning and Zoning Commission, the Beach and Recreation Commission and the Madison Land Conservation Trust. This plan would be very useful in assessing present and future recreational needs and should be supported. The Yale School of Forestry and Environmental Studies or University of Connecticut should be contacted to see whether a conceptual site plan project might be developed by graduate students for an initial design scheme.

The Town of Madison experienced a 44% increase in population and a 49% increase in housing units during the 1970-80 time period. The Town was the fastest growing Town in terms of population for the region during that decade, and the 11th fastest in the State. The 1980-90 decade has shown a continued strong growth rate.

The population growth rate was not as strong as other communities in the region (Branford and Guilford) due to increased multi-family development activity in those communities. The Town of Madison has not experienced the same fluctuations in school enrollment that other Connecticut communities have experienced. The Madison recreation programs attempt to provide all age groups with sufficient access to the Town facilities.

Concern was expressed that the Town was not presently providing enough practice fields for the residents, notably the youth programs. Currently, there are many conflicts concerning the use of the Town's 90-foot baseball diamond. The site to the west of Copse Road provides an excellent area to develop a multi-use field incorporating a 90-foot baseball diamond.

One approach to development of the site is a conceptual plan with certain phasing sequences. First, a 90-foot baseball diamond and associated field, temporary parking and linkage with Hand High School through the perimeter wetlands could be constructed. Second, a passive picnic area could be developed around the ponds along with additional nature trails. In the third phase, additional fields could be designed using a cluster approach. In this sector design (cluster), concentrate the activities in a single area, leaving the rest of the property to be utilized for other activities. Another advantage for constructing regulation baseball and multi-use fields on the site is the possibility of utilizing the current fields at Hand High School for future building expansion and using the off-site fields with trail linkages for the school athletic programs.

In the latest edition of the Connecticut Statewide Comprehensive Outdoor Recreation Plan (SCORP) 1987-92, results of a preference survey conducted by the DEP between 1982 and 1985 illustrated citizen expectations concerning who should be responsible for providing certain recreation activities. Statewide results indicated that most of the citizens polled thought the Town should be the primary provider for

playgrounds, baseball/softball fields and soccer fields. Although polls and statistics are not entirely accurate or noteworthy, some interesting information can be obtained from significant sample studies. The DEP polled 5,000 citizens in their SCORP survey. The results were sorted by the different planning regions in the State. In the South Central Region, the different recreation activities were listed and ranked according to the relative importance of the activity and who should be the provider. A few of the preferences of the citizens polled in the South Central Region area include:

RESPONSIBILITY FOR PROVIDING RECREATIONAL ACTIVITIES

Activity	Town	Private	State
Preserve Open Space	1	21	2
Walking	2	7	9
Protect Natural Beauty	3	11	1
Picnicking	4	17	5
Playgrounds	7	59	32
Baseball/Softball	12	46	43
Tennis	13	19	42
Ice Skating	14	33	28
League Sports	17	45	46
Soccer	24	55	54
Fishing - Fresh	30	50	10

Madison's population is dispersed over a large land area (36.3 square miles), covering close to 20 miles from the northern border to Long Island Sound. The Town is served very well by the recreation facilities at the Surf Club fields, but lacks facilities which are closer to the population base living in North Madison. The site provides relatively flat terrain for fields, compared to much of the rough topography found in North Madison and is marginally closer to the citizens living in the growth areas of Town.

REFERENCES

Adams, L.W.and D.L. Leedy. (Eds.) 1986. Integrating man and nature in the metropolitan environment. Proceedings of a Nat.Symp. on Urban Wildlife. Nat. Inst. for Urban Wildlife.Columbia,MD.

Adams, Lowell W., and Louise E. Dove. 1989. Wildlife Reserves and Corridors in the Urban Environment: A Guide to Ecological Landscape Planning and Resource Conservation. National Institute for Urban Wildlife. 91pp.

Bessinger,S.R. and D.R.Osburn. 1982. Effects of urbanization on avian community organization. Condor 84:75-82.

Best, L.B., D.F. Stauffer, and A.R. Geier. 1978. Evaluating the effects of habitat alteration on birds and small mammals occupying riparian communities. Pages 117-124. in (Strategies For Protection and Management of Floodplain and Other Riparian Communities). Proc. symp. Dec. 11-13, 1978, Gallaway, GA. Gen. Tech. Rep. W0-12, Forest Serv., U.S. Dep. Agric., Wash. D.C. 410pp.

Brown, S., M.M. Brinson and A.E. Lugo. 1978. Structure and functions of riparian wetlands. Pages 17-31. in (Strategies For Protection and Management of Floodplain and Other Riparian Communities). Proc. symp. Dec. 11-13, 1978, Gallaway, GA. Gen. Tech. Rep. W0-12, Forest Serv., U.S. Dep. Agric., Wash. D.C. 410pp.

Campbell, C.A. 1973. Survival of reptiles and amphibians in urban environments. Pages 61-66. in (Wildlife In An Urbanizing Environment). Proc. symp. Nov. 27-29, 1973, Springfield, Mass. Coop. Extn. Serv., Univ. of Mass., U.S. Dep. Agric., Cnty. Extn. Serv. 182pp.

Clark,K.L.,D.L.Euler,and E.Armstrong. 1984. Predicting avian community response to lakeshore development. J. Wildl.Manage. 48 (4):1239-1247.

Conover, Michael R. and Gary S. Kania. 1988. Browsing preference of White-tailed deer for different ornamental species. Wildlife Society Bulletin 16:175-179.

DeGraaf,R.M. and J.M.Wentworth. 1986. Avian guild structure and habitat associations in suburban bird communities. Urban Ecology 9:399-412.

Devlin, D. 1985. Woodland wildlife management. Pennsylvania Woodlands. Penn. State Univ., Col. of Agric., Coop. Exten. Serv. 6:1-6.

Dickman,C.R. 1987. Habitat fragmentation and vertebrate species richness in an urban environment. Jour. of Applied Ecology 24:337-351.

Geis, A.D. 1986. Wildlife habitat considerations in Columbia, Maryland and vicinity. Pages 97-99. in (Wildlife Conservation and New Residential Development). Proc. symp. Jan. 20-22, 1986. Tucson, Ariz., Estes Co., Cottonwood Prop., Nat. Wildl. Fed. 203pp.

Goldstein, E.L., M.Gross, and R.M.DeGraaf. 1983. Wildlife and greenspace planning in medium-scale residential developments. Urban Ecology 7:201-214.

----------. 1986. Breeding birds and vegetation:a quantitative assessment. Urban Ecology 9:377-385.

----------. 1981. Explorations in bird-land geometry. Urban Ecology 5:113-124.

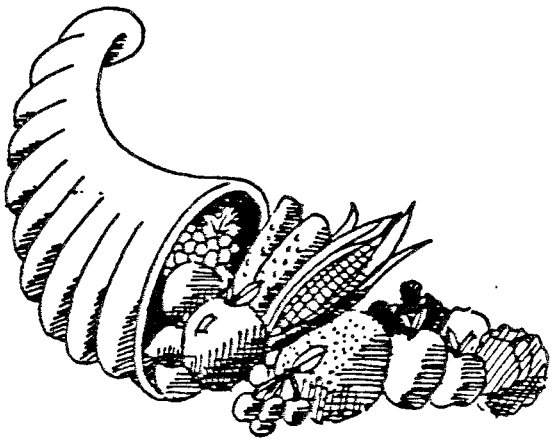
Griffin, C.R. 1989. Protection of wildlife habitat by state wetland regulations: the Massachusetts initiative. Trans.54 N.A. Wildl. and Nat. Res. Conf. 22-31.

Hassinger, J. 1986. Dead wood for wildlife. Pennsylvania Woodlands. Penn. State Univ., Col. of Agric., Coop. Exten. Serv. 7:1-6.

Milligan, D.A. and K.J. Raedeke. 1986. Incorporation of a wetland into an urban residential development. Pages 162171. in (Wildlife Conservation and New Residential Developments). Proc. symp. Jan. 20-22, 1986. Tucson, Ariz. 203 pp.

Vilkitis,J.R. 1978. Wildlife habitat as a integral component of a planned unit development. Urban Ecology 3:171-187.

APPENDICIES



Appendix A: Soil Limitations Chart

MAP UNIT NAME	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	SOIL POTENTIAL FOR ON-SITE SEWAGE DISPOSAL SYSTEMS	MAJOR LIMITATIONS TO THE DEVELOPMENT OF: HOMES WITH BASEMENTS	ROADS & STREETS	LAWNS & LANDSCAPING	PICNIC AREAS	PLAYGROUNDS & PLAYING FIELDS	PATHS & TRAILS
*AA - Adrian and Palms Mucks	Organic material on surface ranging in thickness from 16-50 inches overlying sand or sandy loam material	Very poorly drained +1.0-1.0 ft.	Extremely low	Subsidence ponding	Subsidence ponding, frost action	Ponding, excess humus	Ponding, excess humus	Excess humus, ponding	Ponding, excess humus
†AfA - Agawam fine sandy loam, 0-3% slopes	Nearly level soil formed on outwash terraces of stream valleys	Well-drained >6.0 ft.	High, but area of special concern due to high perc rate, engineered design required	No major limitations	No major limitations	No major limitations	No major limitations	No major limitations	No major limitations
ChC - Charlton very stony fine sandy loam, 8-15% slopes	Upland soil formed on the side slopes of hills and ridges and at the foot slopes of steep slopes where the relief is affected by the underlying bedrock	Well-drained >6.0 ft.	Very high	Slope	Slope	Slope, small stones	Slope, small stones	Slope, small stones	Slope, small stones
CrC - Charlton-Hollis fine sandy loams, 3-15% slopes	Gently sloping and sloping upland soils where relief is affected by the underlying bedrock	Well-drained >6.0 ft.	Charlton - Very high	Slope	Slope	Slope	Slope	Slope	Slope
			Hollis - Very low	Depth to bedrock	Depth to bedrock	Depth to bedrock	Depth to bedrock	Depth to bedrock	Depth to bedrock
†HkB - Hinckley gravelly sandy loam, 3-8% slopes	Upland soil formed on outwash terraces of stream valleys	Excessively drained >6.0 ft.	High, but area of special concern due to high perc rate, engineered design required	No major limitations	No major limitations	Droughty	Droughty	Droughty	No major limitations

MAP UNIT NAME	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	SOIL POTENTIAL FOR ON-SITE SEWAGE DISPOSAL SYSTEMS	MAJOR LIMITATIONS TO THE DEVELOPMENT OF: HOMES WITH BASEMENTS	ROADS & STREETS	LAWNS & LANDSCAPING	PICNIC AREAS	PLAYGROUNDS & PLAYING FIELDS	PATHS & TRAILS
°HkC - Hinckley gravelly sandy loam, 8-15% slopes	Upland soil formed on outwash terraces of stream valleys	Excessively drained >6.0 ft.	High, but area of special concern due to high perc rate, engineered design required	Slope	Slope	Droughty	Droughty	Droughty	No major limitations
HpE - Hollis-Charlton fine sandy loams, 15-35% slopes	Sloping upland soils where relief is affected by the underlying bedrock	Well-drained >6.0 ft.	Charlton - Very high	Slope	Slope	Slope	Slope	Slope	Slope
			Hollis - Very low	Depth to bedrock	Depth to bedrock	Depth to bedrock	Depth to bedrock	Depth to bedrock	Depth to bedrock
PeD - Paxton extremely stony fine sandy loam, 15-35% slopes	Soils formed on the sides of drumlins, ridges and hills of glacial uplands	Well-drained >6.0 ft.	Medium	Slope, large stones	Slope, large stones	Slope, large stones	Slope, large stones	Slope, large stones	Slope, large stones
*°Ru - Rumney fine sandy loam (Rippowam)	Soils formed along the lower flood plains of major streams and their tributaries	Poorly drained 0-1.5 ft.	Very low	Flooding, wetness	Wetness, flooding, frost action	Wetness, flooding	Wetness	Wetness, flooding	Wetness
*Sr - Scarboro muck	Soil formed in depressions on broad outwash terraces and narrow stream valleys	Very poorly drained +1.0-1.0 ft.	Very low	Ponding	Ponding, frost action	Ponding, excess humus	Ponding	Ponding	Ponding
*°Wa - Walpole sandy loam	Nearly level soil in depressions on broad outwash terraces and narrow stream valleys	Poorly drained 0-1.0 ft.	Very low	Wetness	Wetness, frost action	Wetness	Wetness	Wetness	Wetness

*Inland wetland soil †Prime Farmland soil °Additional Farmland of Statewide Importance

NEW HAVEN COUNTY
SOIL AND WATER CONSERVATION DISTRICT
EROSION AND SEDIMENT CONTROL PLAN WORKSHEET

This is a guide for the development and review of erosion and sediment control plans. Local commissions should be consulted for regulation requirements concerning erosion and sediment planning.

Checked ( ) items are those that have been provided on the current erosion and sediment control plan. Items identified with a star (*) should be incorporated into final plans.

NAME OF DEVELOPMENT: _____

MATERIALS RECEIVED: _____

_____

Total Area _____ Location _____
Engineer _____
Date Received _____ Site visit _____ Reviewed by _____
Submitted by _____

NARRATIVE SECTION DESCRIBING:

_____The development
_____Major land uses of adjoining areas
_____The number of total acres and acres to be disturbed in the project
_____The schedule of grading and construction activities including:
- start and completion dates

_____Application sequence of all E & S control measures
_____The design criteria for all proposed E & S control measures
_____Construction details and installation procedures for all proposed E & S control measures
_____The operations and maintenance program for all proposed E & S control measures
_____The name of the person or organization that will be responsible for the installation and maintenance of the E & S control measures
_____Organization or person responsible for maintenance of permanent measures when project is completed. Measures include:

A SITE PLAN AT A SUFFICIENT SCALE SHOWING:

NATURAL FEATURES

_____ Existing topography
_____Existing vegetation
_____Soils information, including test pit data if available
_____Identification of wetlands, watercourses, major drainageways and water bodies on the site
_____Name of soil scientist who performed wetlands delineation and flag numbers
_____Rock outcrop areas
_____Seeps, springs
_____Major aquifers
_____ Floodplains (100 yr) and floodways
_____Channel encroachment line (DEP permit required)
_____Coastal zone boundary
_____ Public water supply watershed boundaries
_____ Possible Army Corps Sec. 404 or Sec. 10 Permit Areas
(Contact Corps @ 1-800-343-4789)

Project Features

_____ The location of the proposed development
_____ A plan legend
_____ Adjacent properties
_____ Property lines
_____ Lot lines and setback lines
_____ Lot and/or building numbers
_____ Planned and existing roads
_____ Proposed structures
_____ Location of existing and planned utilities
_____ Location of wells and septic systems
_____ Proposed topography
_____ North arrow

Clearing, Grading, Vegetative Stabilization

_____ The sequence of grading, construction and sediment and erosion control activities
_____ The location of and construction details for all proposed E & S control measures

Recommended measures include:

_____ Limits of disturbed areas
_____ Extent of areas to be graded
_____ Disposal procedure for cleared material
_____ Location of stockpiled topsoil and subsoil
_____ Temporary erosion protection for stockpiles
_____ Areas to be vegetatively stabilized
_____ Temporary erosion control in disturbed areas
_____ Method for protection of disturbed areas when time of year or weather prohibit establishment of permanent vegetative cover
_____ Seedbed preparation (including topsoiling specifications)
_____ Seeding mixture, rates and seeding dates
_____ Fertilizer and lime application rates
_____ Mulch application rate
_____ Mulch anchoring measures

Drainage System

_____ Existing and planned drainage pattern
_____ Drainage areas used in design of stormwater management system
_____ Size and location of culverts and storm sewers
_____ Drainage calculations for review by town engineer
_____ Stormwater management measures and construction details
_____ Groundwater control measures (footing drains, curtain drains)
_____ Planned water diversions and dams (DEP permit may be required)

House Site Development

_____ Sediment and erosion control measures for individual lot development

Additional Comments

Appendix B: Species Potentially Inhabiting Habitats of the Site

SPECIES POTENTIALLY INHABITING HABITATS OF THE SITE

Reptiles

Common Snapping Turtle	Northern Black Racer
Painted Turtle	Northern Ringneck Snake
Spotted Turtle	Black Rat Snake
Wood Turtle	Eastern Milk Snake
Eastern Box Turtle	Eastern Smooth Green Snake
Eastern Worm Snake	Northern Redbelly Snake
Eastern Ribbon Snake	Eastern Garter Snake

Amphibians

Jefferson's Salamander	Red-spotted newt
Spotted Salamander	Eastern American Toad
Marbled Salamander	Northern Spring Peeper
Northern Dusky Salamander	Gray Treefrog
Northern Two-lined Salamander	Bullfrog
Northern Spring Salamander	Green Frog
Four-toed Salamander	Pickerel Frog
Redback Salamander	Northern Leopard Frog
Slimy Salamander	Wood Frog
Mudpuppy	

Mammals

Opossum	Hoary Bat	Norway Rat
Masked Shrew	Eastern Cottontail	House Mouse
Water Shrew	Eastern Chipmunk	Meadow Jumping Mouse
Smoky Shrew	Woodchuck	Woodland Jumping Mouse
Short-tailed Shrew	Gray Squirrel	Porcupine
Least Shrew	Red Squirrel	Coyote
Hairy-tailed Mole	Southern Flying Squirrel	Red Fox
Eastern Mole	Beaver	Gray Fox
Star-nosed Mole	Deer Mouse	Raccoon
Little Brown Bat	White-footed Mouse	Short-tailed Weasel
Keen's Myotis	Boreal Red-backed Vole	Long-tailed Weasel
Silver-haired Bat	Meadow Vole	Mink
Eastern Pipistrelle	Woodland Vole	Striped Skunk
Big Brown Bat	Muskrat	River Otter
Red Bat	Southern Bog Lemming	White-tailed Deer

Northern Goshawk
Broad-winged Hawk
Rough-legged Hawk
American Kestrel
Ring-necked Pheasant
Wild Turkey
Wood Duck
Killdeer
Mourning Dove
Yellow-billed Cuckoo
Eastern Screech Owl
Barred Owl
Short-eared Owl
Common Nighthawk
Whip-poor-will
Ruby-throated Hummingbird
Red-headed Woodpecker
Yellow-bellied Sapsucker
Hairy Woodpecker
Pileated Woodpecker
Eastern Wood-Pewee
Acadian Flycatcher
Willow Flycatcher
Eastern Phoebe
Eastern Kingbird
Purple Martin
Northern Rough-winged Swallow
Cliff Swallow
American Crow
Black-capped Chickadee
Red-breasted Nuthatch
Brown Creeper
House Wren
Marsh Wren
Northern Mockingbird
Eastern Bluebird
Gray-cheeked Thrush
Hermit Thrush
American Robin
Ruby-crowned Kinglet
Cedar Waxwing
Loggerhead Shrike
White-eyed Vireo
Yellow-throated Vireo
Philadelphia Vireo

Red-shouldered Hawk
Red-tailed Hawk
Sharp-shinned Hawk
Mallard
Ruffed Grouse
Northern Bobwhite
American Woodcock
Black Duck
Canada Goose
Common Barn Owl
Great Horned Owl
Long-eared Owl
Northern Saw-whet Owl
Chuck-will's-widow
Chimney Swift
Belted Kingfisher
Red-bellied Woodpecker
Downy Woodpecker
Northern Flicker
Olive-sided Flycatcher
Yellow-bellied Flycatcher
Alder Flycatcher
Least Flycatcher
Great Crested Flycatcher
Horned Lark
Tree Swallow
Bank Swallow
Blue Jay
Fish Crow
Tufted Titmouse
White-breasted Nuthatch
Carolina Wren
Winter Wren
Gray Catbird
Brown Thrasher
Veery
Swainson's Thrush
Wood Thrush
Golden-crowned Kinglet
Blue-gray Gnatcatcher
Northern Shrike
European Starling
Solitary Vireo
Warbling Vireo
Red-eyed Vireo

Blue-winged Warbler
Tennessee Warbler
Nashville Warbler
Yellow Warbler
Yellow-rumped Warbler
Magnolia Warbler
Black-throated Blue Warbler
Pine Warbler
Palm Warbler
Blackpoll Warbler
Black-and-White Warbler
Prothonotary Warbler
Ovenbird
Louisiana Waterthrush
Connecticut Warbler
Common Yellowthroat
Wilson's Warbler
Yellow-breasted Chat
Northern Cardinal
Indigo Bunting
Rufous-sided Towhee
Chipped Sparrow
Vesper Sparrow
Fox Sparrow
Lincoln's Sparrow
White-throated Sparrow
Dark-eyed Junco
Red-winged Blackbird
Rusty Blackbird
Brown-headed Cowbird
Northern Oriole
Purple Finch
Red Crossbill
Common Redpoll
American Goldfinch
House Sparrow

Golden-winged Warbler
Orange-crowned Warbler
Northern Parula
Chestnut-sided Warbler
Black-throated Green Warbler
Cape May Warbler
Blackburnian Warbler
Prairie Warbler
Bay-breasted Warbler
Cerulean Warbler
American Redstart
Worm-eating Warbler
Northern Waterthrush
Kentucky Warbler
Mourning Warbler
Hooded Warbler
Canada Warbler
Scarlet Tanager
Rose-breasted Grosbeak
Dickcissel
American Tree Sparrow
Field Sparrow
Sharp-tailed Sparrow
Song Sparrow
Swamp Sparrow
White-crowned Sparrow
Bobolink
Eastern Meadowlark
Common Grackle
Orchard Oriole
Pine Grosbeak
House Finch
White-winged Crossbill
Pine Siskin
Evening Grosbeak

Connecticut Wildlife checklist of birds, mammals, reptiles and amphibians.

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.