South Mountain Road

City Owned Property

Meriden, Connecticut

King's Mark Environmental Review Team Report

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

South Mountain Road

City Owned Property
Meriden, Connecticut

Environmental Review Team Report

Prepared by the
King's Mark Environmental Review Team

Of the
King's Mark Resource Conservation & Development Area, Inc.

For the
Planning Commission
Meriden, Connecticut

December 2009
Report #352

Acknowledgments

This report is an outgrowth of a request from the Meriden Planning Commission to the Southwest Conservation District (SWCD) and the King's Mark Resource Conservation and Development Area (RC&D) Council and ERT Subcommittee for their consideration and approval. The request was approved and the measure reviewed by the King's Mark Environmental Review Team (ERT).

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

The field reviews took place on Tuesday, July 12, 2009, Wednesday, July 29, 2009, and Friday, August 7, 2009..

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I would also like to thank Tom Skogland, Meriden Planning Department, Dominick Caruso, Meriden Director of Planning, Jim Anderson, Meriden Planning Department, Patrick Ladd, Meriden GIS Department, Bob Bass, Meriden Department of Public Works and Peter Miller, Neighborhood Preservation Program for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with a location map, maps from the Plan of Conservation and Development (PoCD) and a development concept plan. During the field reviews Team members were given additional information and maps. Following the review, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the city. This report identifies the existing resource base and evaluates its significance to the proposed use, and also suggests considerations that should be of concern to the city. The results of this Team action are oriented toward the development of better environmental quality and the long term economics of land use.

The King's Mark RC&D Executive Council hopes you will find this report of value and assistance in the review of the South Mountain Road property for preservation and development.

If you require additional information please contact:

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Brief Highlights

Topography and Geology

- Most of the ridge (Cathole Mountain) is underlain by traprock (basalt and diabase) Crushed traprock is a valuable construction material.
- LiDAR-based shaded hill-slope imagery reveals several shallow linear valleys that cut across the mountain. These are fracture zones that will likely yield high production water wells if drilled
- Soils across the entire area are not very thick and ledge outcrops in many places. Some areas may be difficult for residential development with on-site sewage disposal and many areas will require blasting for foundation construction.

A Watershed Perspective

- The property contains the headwaters of Sodom Brook. The increased wetted area to water volume ratio in headwater streams suggests that they may strongly influence downstream water quality.
- The current State of Connecticut surface water quality classification for Sodom Brook is B/A which means that Sodom Brook may not be meeting one or more of the water quality criteria which support designated uses.
- Existing water quality issues have been documented for the Quinnipiac River Basin and specifically in Sodom Brook. The 4.16 mile Sodom Brook river segment in a 2008 report was fully supporting for fish consumption but impaired for aquatic life use and recreation.
- The impairments, causes and potential sources for the Sodom Brook segment are

  Recreation – Bacteria (E. coli) Potential Source – Unspecified urban stormwater, upstream impoundments, source unknown

  Habitat for fish, other aquatic life, and wildlife – Unknown cause – Potential Source – unspecified urban stornmwater, impacts from hydrostructure flow regulation modification, upstream impoundments, source unknown, baseflow depletion from groundwater withdrawals.

- A total Maximum Daily Load (TMDL) Analysis for indicator bacteria was developed for the Quinnipiac River Regional Basin in June 2008. A TMDL implementation plan has been developed. Sodom Brook is listed in the TMDL as one of the priority waterbodies for percent reduction of indicator bacteria. Currently Meriden is in compliance with their MS4 Permit, including the 2007-2008 Stormwater Management Plan Annual Report, which states that the city is working to incorporate the requirement of the TMDL into its stormwater management plan.
- Currently the majority of the property is forested. Any development in the area is likely to affect the natural processes of infiltration, interception, filtration by vegetation, and evaporation. It is important that any new development or redevelopment in the watershed employ Best Management Practices (BMPs for stormwater management.

- While the project area is not within the recently approved Aquifer Protection Area regulations for Meriden, it is recommended that the development of the site comply with best management practices for aquifer protection. Given that one of the possible sources of the Aquatic Life Impairment for Sodom Brook is baseflow depletion from groundwater withdrawals, it is of the utmost importance that water quality and quantity issues be addressed.
- Potential for subsurface sewage disposal on the site ranges from low to extremely low.
- Part of the project proposed for development lies within the 100 year flood zone for Sodom Brook. Construction within a flood zone requires compliance with all applicable regulations.
- Riparian buffers and wetland areas occupy a small footprint on the property but they provide many important benefits. It should be noted that there are mapped floodplain areas that extend beyond the delineated inland wetland areas of the proposed development. Full and complete floodplain resource protection should be a priority consideration.
- The Connecticut Association of Wetland Scientists (CAWS) has a vernal pool monitoring program that Meriden may apply for to provide baseline data on vernal pools prior to development.
- The characteristics of the soil types on the property include low suitability for subsurface sewage disposal and stormwater infiltration. Stormwater infiltration structures will need to be sized to compensate for this deficiency in order to maximize infiltration where practicable. Slopes contribute to erosion susceptibility.
- It is possible that construction equipment used in the development of the NRG plant may have compacted soils in the area, particularly in the staging areas. It is essential that the soils be investigated and if necessary, amended, prior to the use of infiltration practices on the site.
- Create a naturally vegetated buffer system along Sodom Brook that also encompasses critical environmental features such as 100-year floodplains, steep slopes and freshwater wetlands.
- In determining a specific 100 acres to be preserved from a Low Impact Development (LID) perspective it is recommended that the first step in the planning process is to determine which areas should not be developed such as wetlands, vernal pools, riparian areas, stream buffers, floodplains, steep slopes, ridgeline protection areas, etc. Specifically this includes prioritizing the preservation of unfragmented habit, wetlands, and associated upland areas.

Southwest Conservation District Review

- Vernal pools – omitting the NRG site and Staging Area, site walks and evidence of perched watertables, drainageways and depressions throughput the property may warrant a field study to qualify and quantify potential vernal pools on site. The ground truthing of potential vernal pools in the surrounding uplands should be considered to investigate, inventory and determine enhanced buffering distances to limit their disturbance and preserve viability of these pools and their associated upland environments.

- Upland trails leading to the wetlands require greater buffering distances, erosion and siltation control and less intrusive walkways across wetland areas.
- Over 90% of the soils on the property fall into Group D Hydrologic Soil Group and in order to attain sufficient infiltration and recharge while protecting down slope environments the assessment and evaluation of runoff treatment has to be enhanced. This is due to the soil characteristics of very slow infiltration rate associated with shallow soils over nearly impervious material.
- Careful design parameters to meet zero increase in runoff under severe conditions would be prudent and is highly recommended in an effort to eliminate any contributory effects from flooding and degradation of water quality to Sodom Brook.
- The preliminary layout and footprint of proposed development seems to be quite spread out and further fragment large tracts of land that appear to be somewhat contiguous at this time. Consolidation of buildings, driveways and parking will reduce infrastructure cost, impervious surface, provide easier access and gain more open space.
- In an effort to preserve the connectivity of open space with the upper reaches of the parcel and the 55 acre Bailey Avenue land, eliminate the proposed roadway, associated infrastructure, the 75,000 sq/ft building, Age restricted housing and Single Family homes that would run parallel to the existing trail connection from the Bailey Avenue Open Space to the Boy's and Girl's Club Trail plus development. This northeast sector of the site possesses soils and topography that are extremely limiting and difficult to develop due to steepness of slope and shallowness of bedrock.

Natural Diversity Data Base

- The State Natural Diversity Data Base has records for State Special Concern Species Box Turtle, Jefferson Salamander Complex and Easter Ribbon Snake and four state listed plant species that include, *Carex squarrosa* (a sedge), Hitchcock's sedge, narrow-leaved glade fern and squirrel corn.
- If work will be conducted in their habitats it is recommended that a herpetologist familiar with the habitat requirements of the herptiles conduct surveys and forward results to DEP.
- It is recommended that the site be surveyed for the listed plant species and reports sent to DEP.

Landscape Ecologist Review

- There are competing uses for the same pieces of land so that choices will have to be made. Visual aesthetics and/or logistical concerns related to placement of potential development should be clearly separated from biological concerns.
- Indiscriminately putting conservation land on the exterior of the property has the potential to lessen habitat viability by fragmenting habitats.
- It is the function of habitat corridors to connect useful habitat so it is important to think about what habitat areas are being connected and why.
- Because of the lack of site specific data on rare plants, animals and habitats known from the area it is difficult to assess trade-offs between protection of

specific rare species and habitats and protection of habitat connectivity at a spatial scale of value to those species that suffer from effects of habitat fragmentation.

- Notable site attributes include:

  Unfragmented forest habitat – offers the opportunity to create a fairly large contiguous habitat block by combining the forest on the site with undeveloped land owned by the town on the northeast, undeveloped land owned by Berlin to the north and land to the west to keep the connectivity to the Hanging Hills Area.

  Potential for undeveloped land to provide a buffer to the Metacomet Trail – it would be desirable to buffer the trail from any sights or sounds of development by not developing the northwestern boundary of the property.

  Potential to provide wildlife corridors where new development would spoil the unfragmented portions of the property – corridors placed next to stream, forested trail buffer.

  Presence of state listed species.

  Large pool in the forest west of the power plant – vernal pools are critical breeding habitat for the Jefferson Salamanders while the adults require terrestrial habitat with a range of 65 to 2051 feet from a vernal pool.

  Presence of invasive plants – invasive plants are present but not overwhelming.

- Recommendations
  - Talk with the Town of Berlin to find out their plans for the adjacent parcel with a goal of contributing to the preservation of an unusually large, unfragmented tract of land.
  - Recommend that field consultants be hired to determine where listed species are found.
  - Conduct in-depth inventories of the property over the course of the four seasons in order to map out plant communities and wildlife use.
  - Buffer the Metacomet Trail with a 250 foot buffer, but this should not be mistaken for the best way to promote habitat viability.
  - It appears to be difficult to find a way to extend South Mountain Road around the large woodland vernal pool. Access from the northern end of the property should be investigated.
  - While invasive plants are not a huge issue, now would be the time to remove Garlic Mustard and Tree-of Heaven before they become uncontrollable.
  - Determine the planned future use of the power plant and consider putting proposed industrial development on the power plant footprint if the power plant will not be used.

Wildlife Resources

- The existing wildlife habitats include traprock ridge, forested habitat, water line easement right of way, and wetlands.
- Traprock ridges are included in a list of "Thirteen of Connecticut's Most Imperiled Ecosystems" and traprock ridges contain many of the habitats of conservation significance that are described in Connecticut's Comprehensive Wildlife Strategy and support many species of Greatest Conservation Need. Traprock ridges also support the state-listed box turtle, ribbon snake, and Jefferson Salamander, all have which been documented on the site and species such as wood frog and spotted salamander that will utilize vernal pools found on the property.
- Large contiguous tracts of forest such as the areas to the west, southwest and north of the power plant are increasing rare in Connecticut. Unfragmented tracts of this size are also rare for urban areas like Meriden and are even more valuable for wildlife when they contain multiple habitat types, such as vernal pools and traprock ridge. Early successional habitats such as old field type found in the water line right of way are also rapidly declining in Connecticut.
- The South Mountain Road property has the potential to provide high value habitat for wildlife due to both the large acreage of undeveloped habitat and the variety of habitat types. To gain the most benefit for wildlife, both the northern portion of the site and the area west of the power plant (containing vernal pools) should be dedicated to open space.

Recreation Planner Review

- Preliminary plans that show open space consisting of a fringe around the property are overlooking an opportunity preserve a sizable block of open space.
- It is recommended to concentrate development south and south west of he NRG plant with any additional development that is necessary or feasible to be east of the roughly north-south running water line right of way easement, in the northeastern quadrant of the property. This would permit dedication of a large open space area in the less physically altered northwestern quadrant adjoining similar open space in Berlin, plus an open space corridor along the western fringe for the New England National Scenic Trail (Metacomet Trail).
- Joint planning with the Town of Berlin to re-locate the New England National Scenic Trail and trail linkages will be necessary.

Introduction

The Meriden Planning Commission has requested Environmental Review Team (ERT) assistance in reviewing and identifying areas for permanent protection in the city owned South Mountain Road Property,

The 289 acre project site is located along the northcentral edge of thee City. The parcel is bound to the north by town of Berlin, to the west by Chamberlain Highway (Route 71), Sams Road and Kensington Avenue to the south, and city owned open space and residential neighborhoods to the east. The NRG power plant building and its accompanying 22.6 acres remain under the control of the generation company. An easement for the piping in cooling water from the Connecticut River exists from the plant boundary northward to Berlin bisecting the site. Two vehicular access points to the site exist, one off of the Chamberlain Highway (South Mountain Road), and the other at the end of Sams Road.

Topography of the site is highly variable, with the greatest relief along the southern sections of the site. The difference is 250 feet between the lowest point near Hicks Avenue and the highest point at the southwestern peak overlooking Route 71. The land uses surrounding the site are quite varied. The Westfield Shoppingtown mall is to the south, with low density residential and undeveloped land to the west in Berlin and to the east is medium density residential and city owned open space.

The site contains sensitive natural resources which include several Natural Diversity Data Base listed species, almost 8 acres of wetlands including the headwaters of Sodom Brook, 135 acres of steep slopes (>25%), a ridgeline protection area and a vernal pool conservation area (+3 acres).

The zoning is a Planned Development District (PDD), which may include light industrial, office, residential and open space.

Objectives of the ERT Study

In March of 2009 the City approved a Plan of Conservation and Development (see Appendix) that calls for developing a large portion of the site for economic development and keeping a portion (100 acres) as permanent open space. The City of Meriden Planning Commission requested assistance in reviewing and identifying areas for permanent protection on the property, prior to opening up the site to intensive development.

The City indicated that they would like assistance in identifying a specific 100 acres on the site for permanent preservation of open space, determined by the following:

- Traprock and rock outcroppings
- On site wetlands and wetland corridors
- Suggested buffer areas for least impact on sensitive features

- Wildlife corridors
- Trails and trial connections
- Guidance on areas for development
- Suggestions for additional open space.

The ERT Process

Through the efforts of the Meriden Planning Commission this environmental review and report was prepared for the City of Meriden.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the city. Team members were able to review maps, portions of the PoCD related to the NRG site, including an illustrative concept plan depicting possible locations for buildings, and other supporting documentation provided by the city.

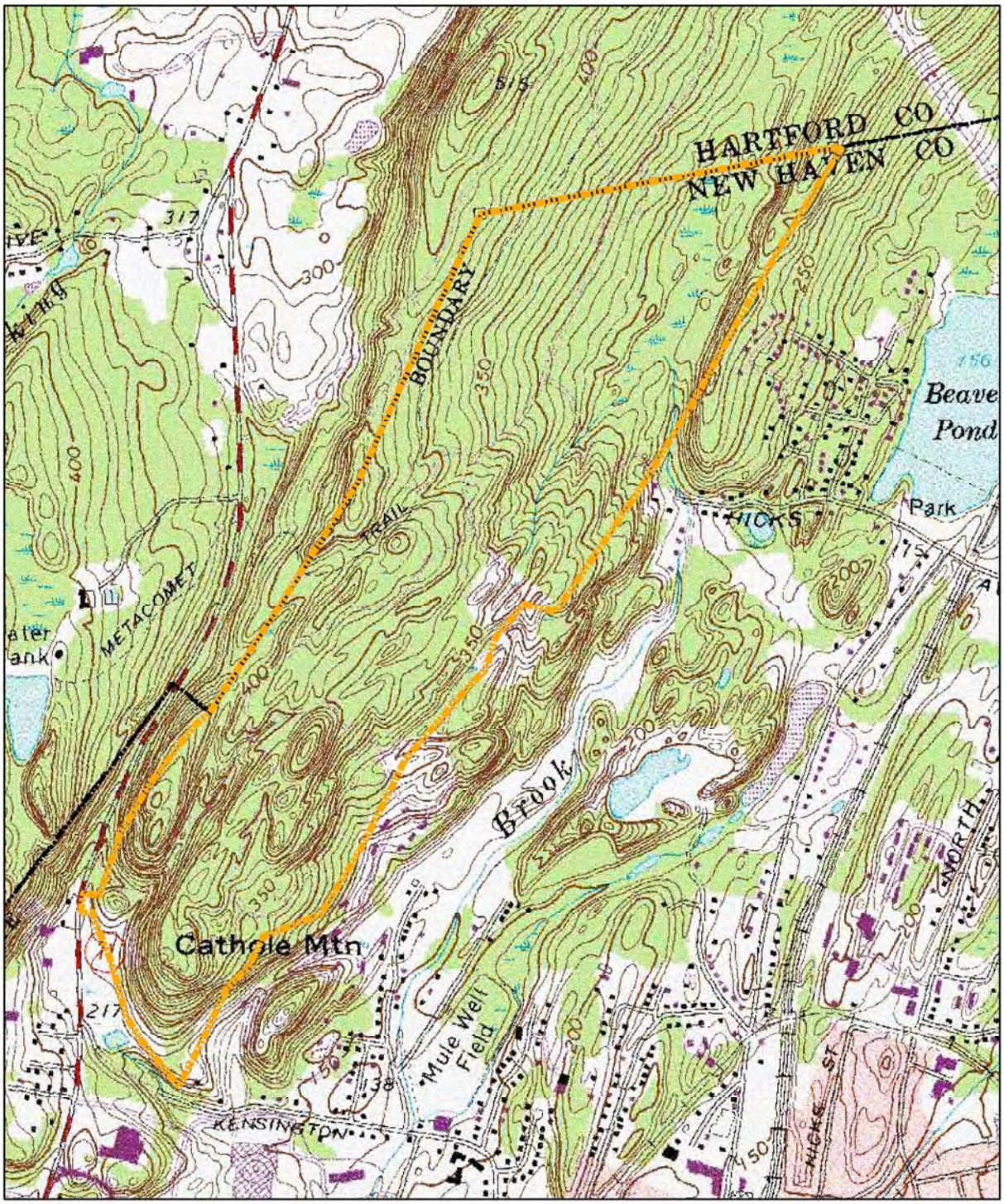
The review process consisted of four phases:

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

The data collection phase involved both literature and field research. The field review was conducted Tuesday, July 21, 2009, Wednesday, July 29, 2009 and Friday, August 7, 2009. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

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

South Mountain Road Area (Former NRG Site) Site Map



The Connecticut Environmental Review Team

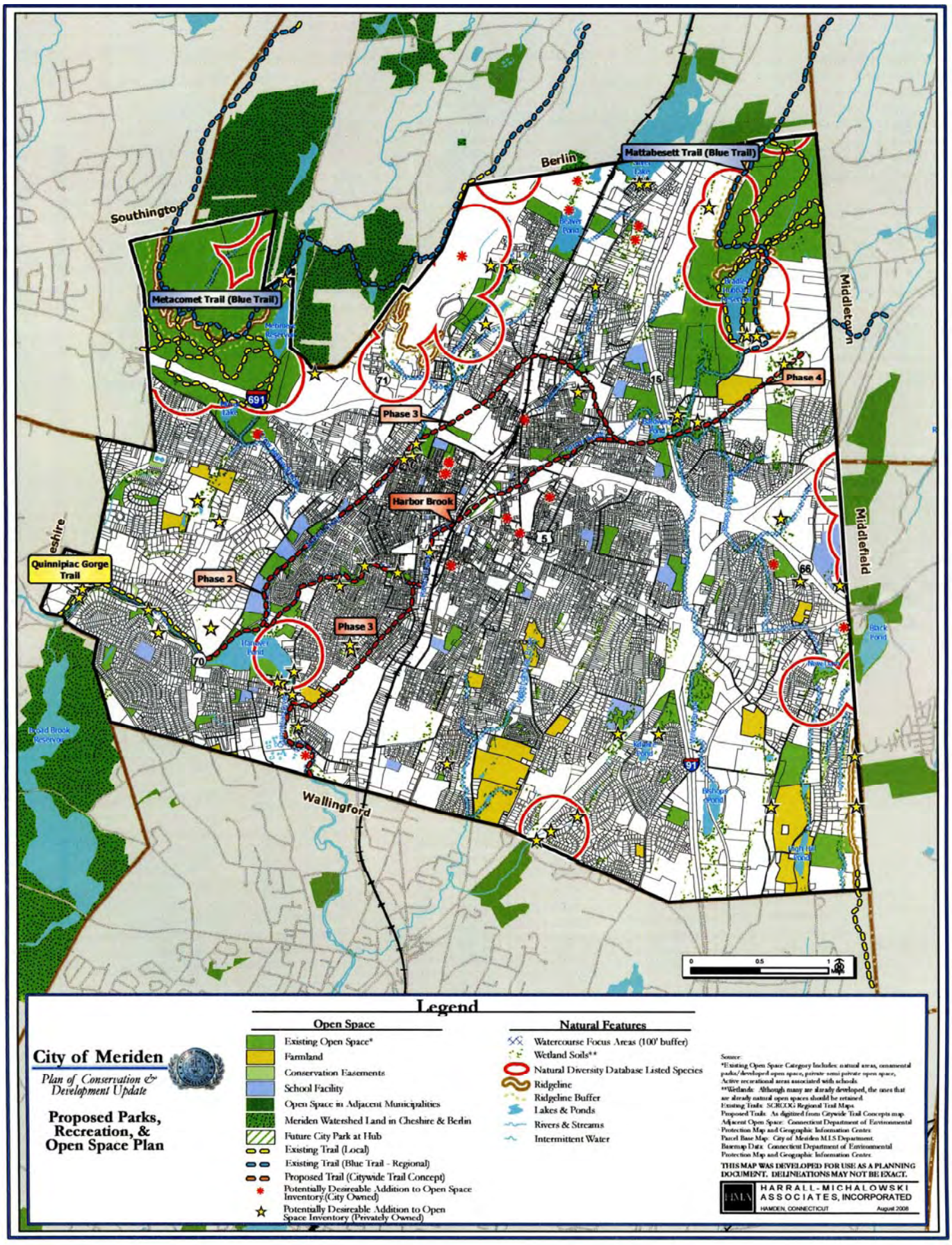
0 0.05 0.1 0.2 Miles

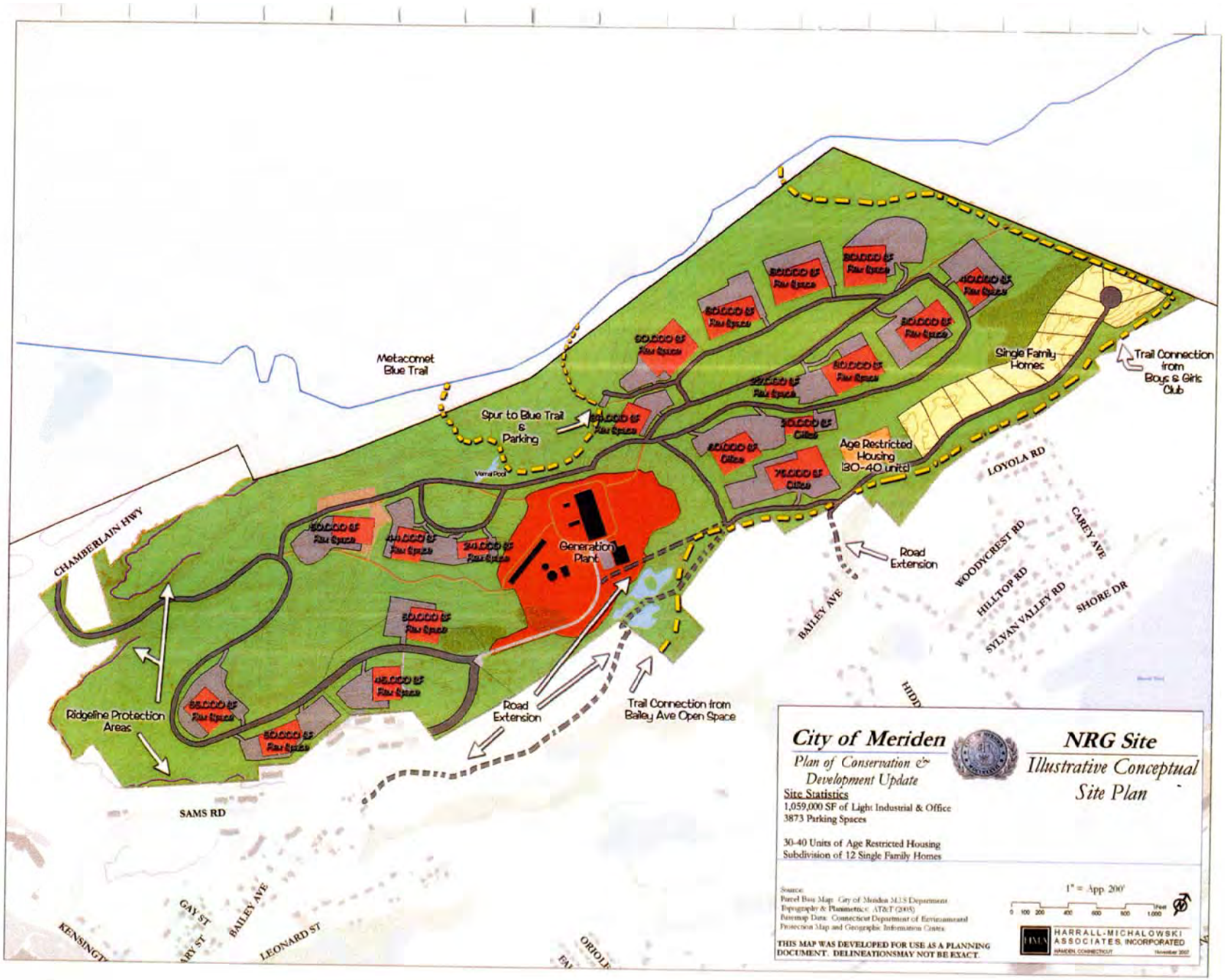
This map was prepared by Amanda Fargo-Johnson for the Connecticut Environmental Review Team.
This map is for educational use only.
It contains no authoritative data.
December 2009.

Approximate Property Boundaries

Meriden, CT

City of Meriden, Connecticut
NRG Plant Property
N
Feet
1 inch = 200 feet
JANUARY 2009
CITY OF MERIDEN
SOURCES:
1995 CITY OF MERIDEN AERIAL FLIGHT PROJECT
2002 SBC AERIAL FLIGHT PROJECT
2005 CITY OF MERIDEN/SBC 100-SCALE AERIAL FLIGHT AND TOPOGRAPHIC MAPPING PROJECT
CITY OF MERIDEN TAX MAPS
DATUM:
CONNECTICUT STATE PLANE NAD 83 FEET
MAP DISCLAIMER:
Every reasonable effort has been made to assure the information provided on the GIS maps and data is current, accurate and complete. However, the GIS database and the maps themselves are subject to constant change and the accuracy and completeness cannot be and is not guaranteed. Independent verification of all data contained herein should be obtained.
The data presented on this map is not legally binding on the City of Meriden or any of its departments. These maps and the associated data are REPRESENTATIONS ONLY and may contain errors in the databases. Therefore, the information presented here is for informational purposes only and should not be construed to be legally binding. The City of Meriden shall not be liable for any loss, damages or claims that arise out of the user's access to, or use of the maps documents and data provided.
Legend
RAIL
RIDGELINE SETBACK
RIDGELINE
BOUNDARIES
Index contour
Index depression contour
Obscured index contour
Obscured index depression contour
Meriden Town Bndry
RICKS AVE
HIDDEN PINES DR
NANCY LA
CATHERINE DR
AMITY ST
SO MOUNTAIN RD
NO COLONY RD
GRACE AVE
GOLDEN ST


Mattabesett Trail (Blue Trail)
Berlin
Southington
Metacomet Trail (Blue Trail)
Middletown
Phase 4
Phase 3
Harbor Brook
Middlefield
Quinnipiac Gorge Trail
Phase 2
Phase 3
Wallingford
City of Meriden
Plan of Conservation & Development Update
Proposed Parks, Recreation, & Open Space Plan
Legend
Open Space
Existing Open Space*
Farmland
Conservation Easements
School Facility
Open Space in Adjacent Municipalities
Meriden Watershed Land in Cheshire & Berlin
Future City Park at Hub
Existing Trail (Local)
Existing Trail (Blue Trail - Regional)
Proposed Trail (Citywide Trail Concept)
Potentially Desireable Addition to Open Space Inventory (City Owned)
Potentially Desireable Addition to Open Space Inventory (Privately Owned)
Natural Features
Watercourse Focus Areas (100' buffer)
Wetland Soils**
Natural Diversity Database Listed Species
Ridgeline
Ridgeline Buffer
Lakes & Ponds
Rivers & Streams
Intermittent Water
Source:
*Existing Open Space Category Includes: natural areas, ornamental parks/developed open space, private semi-private open space, Active recreational areas associated with schools.
**Wetlands: Although many are already developed, the ones that are already natural open spaces should be retained.
Existing Trails: SCRCOG Regional Trail Maps.
Proposed Trails: As digitized from Citywide Trail Concepts map.
Adjacent Open Space: Connecticut Department of Environmental Protection Map and Geographic Information Center.
Parcel Base Map: City of Meriden M.I.S Department.
Basemap Data: Connecticut Department of Environmental Protection Map and Geographic Information Center.
THIS MAP WAS DEVELOPED FOR USE AS A PLANNING DOCUMENT. DELINEATIONS MAY NOT BE EXACT.
HARRALL-MICHALOWSKI ASSOCIATES, INCORPORATED
HAMDEN, CONNECTICUT
August 2008


Metacomet Blue Trail
Spur to Blue Trail & Parking
Vernal Pool
Single Family Homes
Trail Connection from Boys & Girls Club
Age Restricted Housing (30-40 units)
LOYOLA RD
CHAMBERLAIN HWY
Generation Plant
Road Extension
WOODYCREST RD
CAREY AVE
HILLTOP RD
SYLVAN VALLEY RD
SHORE DR
BAILEY AVE
Ridgeline Protection Areas
Road Extension
Trail Connection from Bailey Ave Open Space
SAMS RD
GAY ST
BAILEY AVE
LEONARD ST
City of Meriden
Plan of Conservation & Development Update
NRG Site
Illustrative Conceptual Site Plan
Site Statistics
1,059,000 SF of Light Industrial & Office
3873 Parking Spaces
30-40 Units of Age Restricted Housing
Subdivision of 12 Single Family Homes
Source:
Parcel Base Map: City of Meriden MIS Department
Topography & Planimetrics: AT&T (2005)
Basemap Data: Connecticut Department of Environmental Protection Map and Geographic Information Center
1" = App. 200'
THIS MAP WAS DEVELOPED FOR USE AS A PLANNING DOCUMENT. DELINEATIONSMAY NOT BE EXACT.
HARRALL-MICHALOWSKI ASSOCIATES, INCORPORATED
HAMDEN, CONNECTICUT

Topography and Geology

The South Mountain Road parcel is situated on a fault-bounded ridge, the southern part of which is identified on topographic maps as Cathole Mountain (see preceeding maps). The ridge is north-northeasterly trending and achieves its greatest elevation (515 feet above sea level) just north of the Berlin town line (north of parcel). Cathole Mountain proper, located southwest of the former NRG plant (in the town of Meriden), reaches an elevation of about 485'. The ridge rises abruptly on its south and west sides with numerous cliffs. The ridge stands about 200+ feet higher than the valley below. The topography in general is rough to moderate with many steep slopes scattered around the southern portion of the property. The northern portion of the property is characterized by more moderate easterly facing slopes. A second ridge line with steep, possibly cliffed, westerly facing slopes forms the northeastern border of the parcel. The topography of the area is greatly influenced by the underlying bedrock (ledge).

Most of the ridge is underlain by traprock (basalt and Diabase; see Figure 1). It is a dark-colored rock formed of the minerals pyroxene and plagioclase feldspar. Traprock

A. **B.**

Figure 1. Trap rock outcrops. A. Outcrop that was cut to accommodate South Mountain Road. This is a typical outcrop of basalt. It is a highly fractured rock. It forms a low ridge-like hill that the roadway cuts across. In this outcrop many of the fractures are oriented near vertical and parallel to the axis of the ridge-like hill, suggesting that the low area to the right of the hill is a major fracture zone or perhaps a minor fault. B. Head-wall behind former NRG plant is composed of basalt that has numerous fractures that are not oriented.

is a dense rock that breaks into fragments with sharp edges that compact well. Crushed traprock is a valuable construction material. Processed gravel is a good road base. Crushed traprock is also used as aggregate in concrete and asphalt. Large broken fragments are used as rip-rap to stabilize slopes and protect against erosion.

The traprock was formed about 200 million years ago as a lava flow that issued from fissures to the east of Meriden. The lava filled a long valley to a depth of 300 or more feet, thus forming a layer of basalt when it cooled. Geologists refer to the ridge-forming traprock on Cathole Mountain as the Holyoke Basalt. It forms a layer that today is tilted toward the east. It is the same layer that is found at Castle Craig on Meriden Mountain and on Lamentation and Higby Mountains to the east.

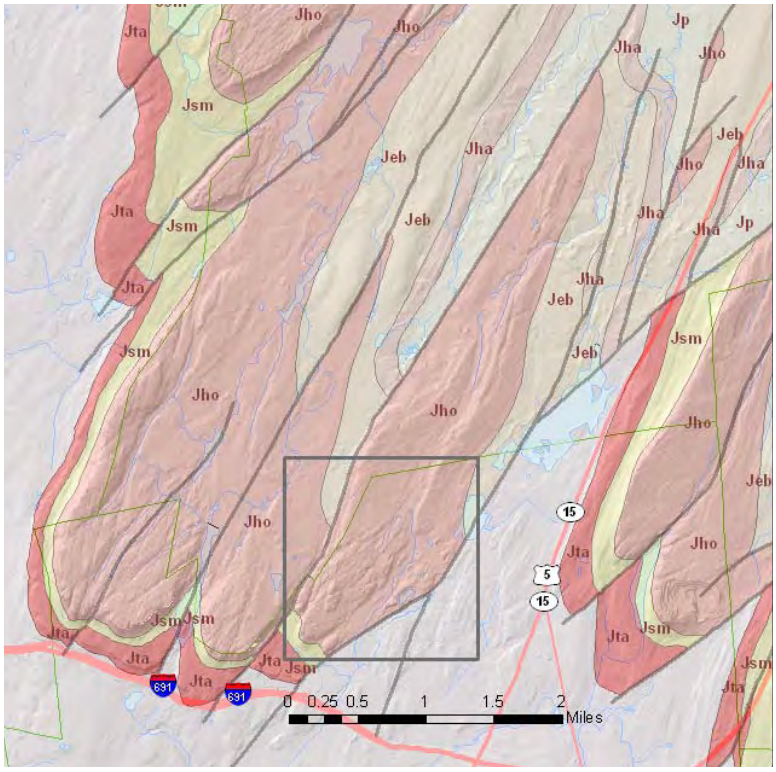


Figure 2. Bedrock geologic map superposed on a shaded hill-slope LiDAR image. Inset (box) shows detail area (Figure 3). Distribution of rock formations shown by different colors with abbreviated labels. Oldest rocks are New Haven Arkose (Trnh: shaded gray). This formation is overlain by Talcott Basalt (Jta: red). Yellow is Shuttle Meadow Formation (Jsm). Holyoke Basalt, pink (Jho)is overlain by East Berlin Formation (jeb) which is overlain by Hampden Basalt (Jha: lite pink). Gray lines are major faults. Meriden Mountain is in the southwest quadrant of map; Lamentation Mountain is along the eastern portion of map. (Geology from Rodgers, 1985)

Layers of sedimentary rocks and another basalt layer formed on top of the Holyoke basalt. Faults in the valley caused all the layers to gently tilt toward the east. Later more fault-planes broke the layers into slices and slippage along the planar breaks caused the rock slices to shift downward and, in some cases, sideways. Hence, the Holyoke Basalt is no longer a continuous flat plane; rather it is tilted and broken with large blocks having been up-thrown or down-dropped. Cathole Mountain is bounded on both its eastern and western side by the faults. Along the western fault it moved upward relative to rocks at Meriden Mountain (or perhaps the slice at Meriden Mountain dropped downward). Cathole Mountain slice dropped downward relative to the slices at Lamentation and Higby Mountains.

Erosion removed younger layers (the layers on top). Basalt is more resistant to those erosional forces and hence, it stands in relief forming the ridges. The most recent erosional event was caused by the Ice Age glaciers and the meltwater after they wasted away.

LiDAR-based shaded hill-slope imagery (Figure 3) reveals several shallow linear valleys that cut diagonally across the mountain. Most are oriented ~N.60^{o}E. Once recognized, these features can be found on the ground (Figure 4). These are fracture zones where the rock has increased susceptibility to erosion and hence the shallow valleys formed. Fracture zones will likely yield high production water wells if drilled.

Soils (developed on thin glacial till) across the entire area are not very thick and ledge crops out in many places. Some areas may be difficult for residential development if on-site sewage disposal systems (septic tanks) are required. In many areas, blasting may be needed for foundation construction.

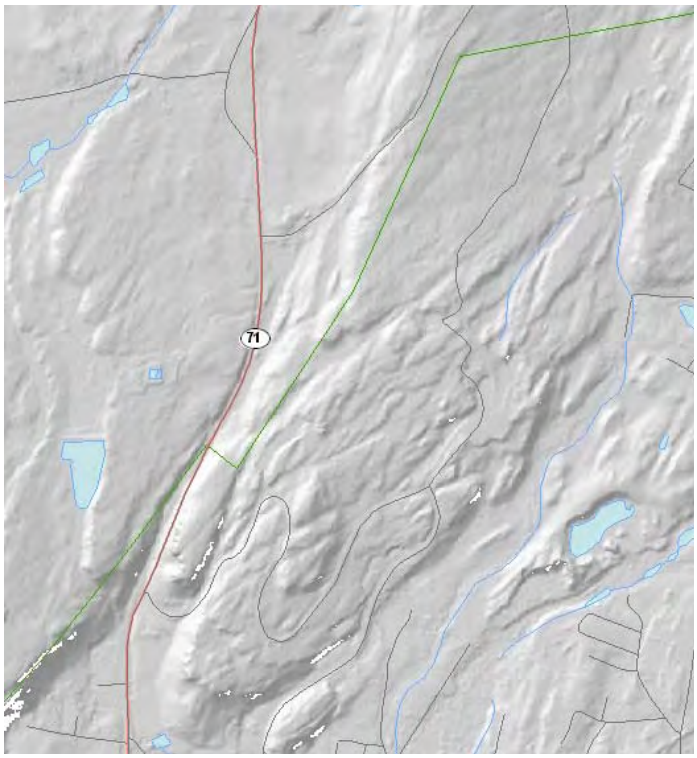


Figure 3. Hill-shaded LiDAR image of Cathole Mountain and vicinity (see Figure 2. Major west-facing slopes result from north-northeast trending faults. More subtle northeasterly trending linear features are valleys formed along fracture zones or minor fault zones. These features are cut off by the north-northeasterly faults and thus are an older feature. Green line is boundary between Meriden on the south and Berlin on the north.

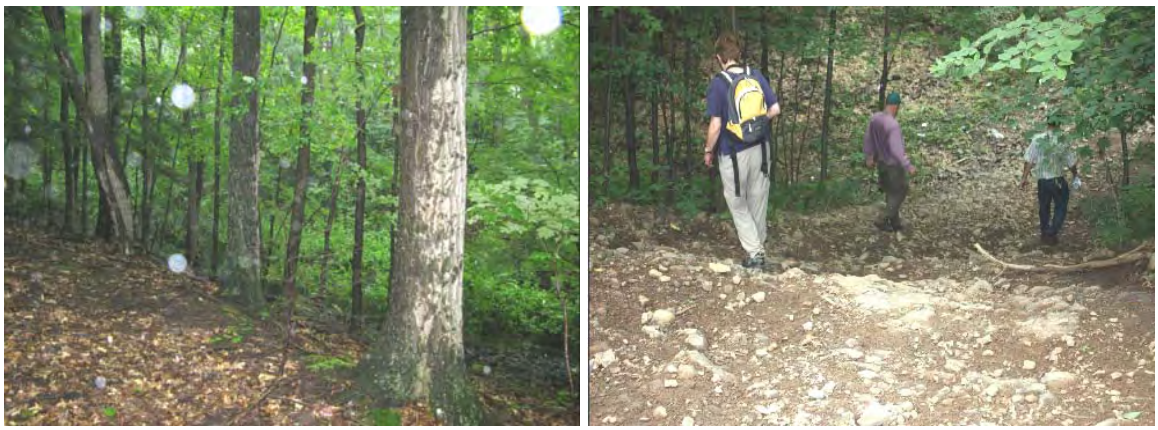


Figure 4. Shallow linear valleys oriented northeast that scar the easterly-facing ridge-slope. These are caused by fracture zones and/or small displacement (minor) faults.

References

Rodgers, John, 1985, Bedrock Geological Map of Connecticut. State Geological and Natural History Survey of Connecticut, Nat'l. Resource Atlas Series

A Watershed Perspective

General Watershed Characterization

The major natural resources include significant amounts of traprock and rock outcroppings along the northwestern portion of the property, steep slopes throughout the property, with ridgeline protection areas in the southern portion, evidence of vernal pools along the western boundary, and wetlands located in the northeastern portion of the property. Currently, the site is mostly forested with the exception of the NRG property surrounding the plant site, staging areas used during construction of the plant, and the utility corridors. The property is one of the few remaining large stretches of undeveloped land in Meriden.

The property also contains the headwaters of Sodom Brook. The flow of water from land to headwater channels is relatively short compared to larger rivers, so responses to land changes can be more rapidly detected. Because headwater streams have narrower widths and shallower depths than larger streams and rivers, a larger proportion of water flowing through headwater channels is directly contacting (and exchanging water and solutes with) the stream bed at a given time. Biogeochemical processes (e.g., denitrification) and biotic densities are often higher in the saturated sediments of beds and banks than in the water column. The increased wetted area to water volume ratio in headwater streams suggests that they may strongly influence downstream water quality (EPA, 2006).

Sodom Brook is the second smallest sub-basin (statewide drainage basin code 5206) of the Quinnipiac River Regional Watershed (statewide basin code 52), with 9.3 miles of watercourses over a 13.7 km^2 area (Anisfeld & Zajac, 2000). A watershed is the land area that drains to a common receiving water body such as a stream, lake or wetlands. It is an easily identifiable landscape unit that ties together terrestrial, aquatic, geologic, and atmospheric processes.

Sodom Brook starts at the small wetland area on the northern portion of the property proposed for development, flows southeast through Meriden, and meets the Quinnipiac River at Hanover pond. The majority of the Sodom Brook sub-watershed is located in the City of Meriden, with small portions of the watershed included in the towns of Berlin and Southington (Anisfeld & Zajac, 2000).

Water Quality Conditions

Surface and Ground Water Classification

The current State of Connecticut surface water quality classification for Sodom Brook is B/A. Sodom Brook may not be meeting one or more of the water quality criteria, which support designated uses. Class A surface waters have designated uses for: habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. The water quality goal (and the associated management actions) is the achievement of Class A criteria and the attainment of these designated uses. All permitted wastewater discharges are limited in

Class A surface waters. The State of Connecticut Water Quality Standards, with associated Criteria for Surface Waters and Ground Waters, is available on-line at: http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325618&depNav_GID=1654.

The current Connecticut ground water classification for the associated development area is GA. The designated uses for GA waters are: existing private and potential public or private supplies of water suitable for drinking without treatment; baseflow of hydraulically connected surface water bodies. CT DEP presumes that ground water in such areas is, at a minimum, suitable for drinking or other domestic uses without treatment. The management goal is to protect these designated uses of Sodom Brook and associated ground water resources.

Water Quality Assessment

Existing water quality issues have been documented for the Quinnipiac River basin and specifically in Sodom Brook. The 4.16 mile Sodom Brook river segment (defined as from the mouth at its confluence with the Quinnipiac River (flows into north side of Hanover Pond portion of river), upstream to its headwaters (just upstream of second Hicks Avenue crossing, due to river changing direction, in Meriden) was listed in the *2008 Integrated Water Quality Report to Congress* as fully supporting for fish consumption but impaired for aquatic life use and recreation. The report is available at http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325610&depNav_GID=1654.

The impairments, causes, and potential sources for the Sodom Brook segment are listed below:

Impaired Designated Use	Cause	Potential Source
Recreation	Bacteria (E. coli)	Unspecified urban stormwater, upstream impoundments, source unknown
Habitat for fish, other aquatic life, and wildlife	Unknown	Unspecified urban stormwater, impacts from hydrostructure flow regulation modification, upstream impoundments, source unknown, baseflow depletion from groundwater withdrawals

In addition, a Total Maximum Daily Load (TMDL) Analysis for indicator bacteria was developed for the Quinnipiac River Regional Basin in June 2008. A TMDL is a management tool used to restore impaired waters by establishing the maximum amount of a pollutant that a waterbody can receive without adverse impacts to fish, wildlife, recreation, or other public uses and provides guidance for responsible parties to use as a framework for developing a TMDL implementation plan. A copy of the TMDL can be

found on the CT DEP web site at http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325604&depNav_GID=1654.

Meriden is a designated urban area by the US Census Bureau and is required to comply with the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 Permit). The permit requires municipalities to develop a program aimed at reducing the discharge of pollutants, as well as to protect water quality. The permit includes a provision requiring towns to focus their stormwater plans on waterbodies for which TMDLs have been developed. Meriden is currently in compliance with their MS4 Permit, including the 2007-2008 Stormwater Management Plan Annual Report, which states that the city is working to incorporate the requirements of the TMDL into its stormwater management plan.

Sodom Brook is listed in the TMDL as one of the priority waterbodies for percent reduction of indicator bacteria. The majority of the site being reviewed is currently forested land. Any development in the area is likely to affect the natural processes of infiltration, interception, filtration by vegetation, and evaporation. As such, it is important that any new development or redevelopment in the watershed employ Best Management Practices (BMPs) for stormwater management.

Leachate and Wastewater Discharge Inventory

Review of the state Leachate and Wastewater Discharge Sources Inventory that supports the Water Quality Classifications, indicates that there are no leachate sources, discharge of treated wastewater effluent, or contaminated wells upstream of the development area.

Contamination or Potential Contamination Sites

The Department maintains a database of "Hazardous Waste Facilities" as defined in Section 22a-134f of the Connecticut General Statutes. A review of the listings within the City of Meriden does not indicate any sites within or proximate to the area under this site review. For more information about this statewide database, visit the CT DEP website at: http://www.ct.gov/dep/cwp/view.asp?A=2715&Q=325018.

Registered Underground Storage Tanks (USTs)

Development within areas with USTs requires compliance with all applicable regulations. For more information contact the CT DEP Underground Storage Tank Program at 860-424-3374.

Water Supply Wells

A review of the CT DEP's database indicates there is an identified large public water supply well (Mule Well Field) located south of the area under review. Public water service is currently provided in some areas adjacent to, but not within the area being reviewed including the residential neighborhoods to the east and west of the property and to the areas just south of the property. Potential exists for potable water infrastructure to connect to these areas to supply the undeveloped parcels under this review. Any development on site should include an estimate of public water use and be evaluated by

the Meriden Water Division. Superintendant David Lohman is the liaison for water supply plans and can be contacted at 203-630-4256.

Aquifer Protection Areas (APAs)

None of the property under review is included within an approved Aquifer Protection Area (APA). Level A mapping delineates final Aquifer Protection Areas, which is the regulatory boundary for land use controls designed to protect water supply wells from contamination. Land use regulations are established in those areas to minimize the potential for contamination of well fields. The regulations restrict development of certain new land use activities that use, store, handle or dispose of hazardous materials and require existing regulated land uses to register and follow best management practices. While the development area is not within the recently approved APA regulations for Meriden, it is recommended that the development of the site comply with best management practices for aquifer protection. Groundwater and surface water resources are linked such that when a well withdraws enough groundwater, the surface waters in the area can begin to feed into the groundwater supply and possibly contaminate public drinking water supplies. Given that one of the possible sources of the Aquatic Life impairment for Sodom Brook is baseflow depletion from groundwater withdrawals, it is of utmost importance that water quality and quantity issues be addressed. Additional information about the Connecticut APA Program, including guidance to Meriden on ground water resource protection and with areas not included in the current designation areas, can be found at the CT DEP website at: http://www.ct.gov/dep/cwp/view.asp?a=2685&q=322252&depNav_GID=1654.

Municipal Wastewater Service Areas

The existing Meriden sanitary wastewater sewer service area does not include the proposed development area. Potential exists for sanitary wastewater infrastructure to be extended into the development site from neighboring developments.

On-Site Wastewater Treatment

Potential for subsurface sewage disposal on the site ranges from low to extremely low.

Stream Channel Encroachment Lines (SCEL)

SCELs are regulated areas within the State of Connecticut. They are a nonstructural element in Connecticut's ongoing effort to reduce the loss of life and property from flooding events. This program is administered to assure that floodplain development is compatible both structurally and hydraulically with the flood flows expected in 270 miles of the State's most flood prone rivers regulated under this program. The actual encroachment lines delineate the limits of State authority, and in general, roughly outline the limits of the national flood insurance program 100-year riverine floodplain. Town

land use commissions reviewing site conservation and development proposals can assist State regulatory actions by alerting private and public landowners of designated SCELs. There are no SCELs designated for Sodom Brook. Any questions regarding the SCEL program should be directed to the CT DEP Inland Water Resources Division at (860) 424-3019.

100 Year Flood Zone

Part of the area proposed for development lies within the 100 year flood zone for Sodom Brook. Construction within a flood zone requires compliance with all applicable regulations. Contact CT DEP Inland Water Resources Division at (860) 424-3019 for questions regarding flood management.

Riparian/Wetland Areas

Although riparian/wetland areas occupy a rather small footprint on the proposed site, their highly variable and complex combinations of physical and biological characteristics create tremendously productive ecosystems. The physical functions of healthy riparian systems include:

- sediment and pollutant filtering,
- bank stabilization, and
- surface/ground water storage and release.

When these physical features are working they are able to sustain a range of benefits or values such as fish and wildlife habitat, flood control, erosion and sediment control, recreational opportunities, and more. In brief, these areas serve as places of great ecological, social, cultural, historic and aesthetic importance.

Riparian buffers can effectively trap and filter sediments and debris from rain events and snow melt. On average, wider shorelines are more effective than narrow shorelines. Further, vegetated shorelines comprised of trees, shrubs and grasses are more effective in this function than with just grass cover.

Riparian vegetation also slows the flow of runoff and provides for infiltration into soil. This in turn will aid in ground water recharge. That ongoing process, if left undisturbed, can supply benefits to Sodom Brook by extending water flow during the drier seasons. Building within or adjacent to delineated floodplains can increase the risk for property damage on–site and to downstream portions of the community. It should be noted that there are mapped floodplain areas that extend beyond the delineated inland wetland areas of the proposed development. Full and complete floodplain resource protection should be a priority consideration.

Vernal Pool Wetlands

ERT site visits indicated vernal pool wetlands within the proposed development area. The ERT request seeks input on land use and/or management plan guidelines for conserving open space. Meriden can take advantage of a program that enhances local understanding and supports integrated land use planning for natural resources within the region. The Connecticut Association of Wetlands Scientists (CAWS) is an organization

of wetland professionals, land use commissioners and their staff involved with wetlands regulations and conservation. CAWS has a Vernal Pooling Monitoring Program and is seeking assistance to identify applications that contain a verified or potential vernal pool. Commissions can then ask a landowner applicant to include the vernal pool(s) in an open space or conservation easement to allow for long term monitoring of the pool(s) by CAWS volunteers. Town commissions would be asked to submit project maps and plans to CAWS. The program is based on volunteers, requires no cost, excludes landowner liability through a waiver release, and provides baseline data prior to developments within vernal pool areas. This is an opportunity for the Meriden to promote better watershed-based conservation planning that considers resource connectivity than are generally available through state or federal governments. For more information on the CAWS program, contact Ed Pawlak at (860) 561-8598 or visit the CAWS web site at: http://www.ctwetlands.org/vpmonitoring.html.

Soils and Quaternary Geology

The soils on this site are generally formed on till that is stony or shallow to bedrock with some disturbed soils near developed access roads and utility corridors. There is a vernal pool complex containing two significant pools with another up-gradient area of seasonally-saturated hydric soils. In addition, the headwaters of Sodom Brook, and a tributary, transect the property in the northeastern portion. These headwater wetlands are mostly formed on erosional surfaces and are bedrock controlled.

The characteristics of these soil types include low suitability for subsurface sewage disposal and stormwater infiltration. Stormwater infiltration structures will need to be sized to compensate for this deficiency in order to maximize infiltration where practical. Slopes contribute to erosion susceptibility. Appropriate best management practices, including attention to re-establish vegetation rapidly in disturbed areas, must be used to stabilize slopes after disturbance, particularly long slopes which are present throughout the site.

The USDA Natural Resources Conservation Service - CT Office (NRCS) recently produced several soil survey interpretations that evaluate the suitability of Connecticut soils for widely used post-construction stormwater runoff management systems including potential for using dry detention basins, infiltration, pervious pavement, and wet extended detention basins as stormwater Best Management Practices (BMPs). The purpose of these interpretations is to help in utilizing soil survey information as a screening tool for successful selection and implementation of best management practices (BMPs) for stormwater runoff. NRCS personnel are available to provide information about these interpretations and provide guidance on additional site evaluations necessary to determine if some BMP types can be utilized in areas of the proposed development. Contact Lisa Krall, Soil Interpretation Specialist, at the NRCS State office at (860) 871-4051.
It is possible that construction equipment used in the development of the NRG plant may have compacted soils in the area, particularly in the staging areas. It is essential that the soils be investigated and if necessary, amended, prior to the use of infiltration practices on the site.

Nonpoint Source Pollution

Runoff from construction and post-construction activities has the potential to pollute wetlands and watercourses downstream of stormwater discharge locations. During construction, the discharge of sediment can occur even when non-structural and structural erosion and sediment controls are installed. Post-construction, the increase in the quantity and peak flow of stormwater runoff can contribute to downstream flooding and erosion problems, and transport pollutants such as suspended solids, hydrocarbons, metals, nutrients, pesticides, and pathogens.

Rain and snowmelt collect pollutants and contaminants (including heat from the pavement, known as "thermal" loading), and are conveyed by traditional stormwater systems (e.g. catch basins and storm sewers), which are often discharged directly into rivers and streams. Impervious surfaces such as roadways, rooftops, paved driveways, and sidewalks, also decrease the amount of precipitation that percolates into the ground to recharge aquifers, which would otherwise be slowly released as base flow to streams during seasonally low-flow periods. During storm events, the increased volume and velocity of stormwater runoff often exceeds the physical ability of the receiving water body to handle such flows, thereby causing flooding, erosion and sedimentation, and physically altering the aquatic habitat.

Stormwater Treatment

Stormwater treatment practices remove pollutants from stormwater through physical, chemical, and biological mechanisms. Many pollutants in stormwater runoff are attached to solid particles, so treatment practices designed to remove suspended solids from runoff can remove other pollutants as well. Exceptions include nutrients, which are often in a dissolved form, soluble metals and organics, and extremely fine particulates that can only be removed by treatment practices other than traditional separation methods. By promoting infiltration, the volume of runoff is reduced and impacts to water quality and quantity are minimized.

Stormwater Quality Manual

The DEP's *2004 Connecticut Stormwater Quality Manual* provides guidance on the measures necessary to protect the waters of the state from the adverse impacts of post-construction stormwater runoff. The manual focuses on site planning, source control, pollution prevention, and stormwater treatment practices, and is intended for use as a planning tool and design guidance document. At a minimum, stormwater treatment practices should be designed, installed and maintained in accordance with the guidelines specified in the manual. The manual is available at: http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325704&depNav_GID=1654 .

Low Impact Development

Low Impact Development (LID) incorporates land use planning and design practices and technologies to simultaneously conserve and protect natural resource systems while

allowing land to be developed in a cost-effective manner that helps to avoid and minimize potential environmental impacts. The goal of LID is to reduce or prevent any measurable harm to streams, lakes, wetlands, and other aquatic systems from residential, commercial, or industrial development projects.

In order to reduce the impact of development and address stormwater quality issues, CT DEP encourages the use of LID measures. LID maintains or replicates predevelopment hydrology through the use of small-scale controls integrated throughout a site to manage stormwater runoff as close to its source as possible. Infiltration of stormwater through LID helps to remove sediments, nutrients, heavy metals, and other pollutants from runoff. Successful LID projects will also reduce land development and infrastructure costs as they protect a property's natural resources and diverse functions.

Key strategies for effective LID include: infiltrating, filtering, and storing as much stormwater as feasible, managing stormwater close to where the rain/snow falls, managing stormwater at multiple locations throughout the landscape, conserving and restoring natural vegetation and soils, preserving open space and minimizing land disturbance, designing the site to minimize impervious surfaces, and providing for maintenance and education. Water quality and quantity benefits are maximized when multiple techniques are grouped together. In areas of compacted and/or possibly contaminated soils, soil suitability should be further investigated prior to selecting optimum treatment and/or remediation measures. Where soil conditions permit, the CT DEP typically recommends and/or requires the utilization of one, or a combination of, the following measures:

- install structural stormwater management measures to treat stormwater runoff during construction. Such measures include, but are not limited to, earthen dikes/ diversions, sediment traps, check dams, level spreaders, gabions, temporary or permanent sediment basins and structures;

- prepare a stormwater management plan, which considers both quantity and quality of runoff for the entire development site, rather than piecemeal during development of each lot. Further information can be found at the EPA and DEP stormwater management web sites referenced below at http://cfpub.epa.gov/npdes/stormwater/swppp.cfm or http://www.ct.gov/dep/lib/dep/Permits_and_Licenses/Water_Discharge_General_Permits/storm_const_gp_reissue08.pdf;

- promote sheet flow over land to the maximum extent possible by: installing and maximizing the use of vegetative swales, increasing and lengthening drainage flow paths, and lengthening and flattening slopes, bearing in mind the goal of minimizing land grading and disturbance. For examples and more information on how these practices can be incorporated, visit the Jordan Cove website at http://www.jordancove.uconn.edu/.

- infiltrate stormwater discharges to the maximum extent possible to promote groundwater recharge and lessen the quantity of runoff needing treatment through the use of vegetated swales, tree box filters, or infiltration islands to

infiltrate and treat stormwater runoff (from building roofs, roads, and parking lots). For more information, visit the NEMO Planning for Stormwater web site at http://nemo.uconn.edu/tools/stormwater/index.htm;

- minimize access road widths and parking lot areas to the maximum extent possible to reduce the area of impervious surface;
- the use of pervious pavement or grid pavers (which are very compatible for parking lot and fire lane applications), or impervious pavement without curbs or with notched curbs to direct runoff to properly designed and installed infiltration areas;
- the use of dry wells to manage runoff from building roofs;
- the use of rain gardens to manage runoff from roofs and driveways;
- incorporation of proper physical barriers or operational procedures for special activity areas where pollutants could potentially be released (e.g. loading docks, maintenance and service areas, dumpsters, etc.);
- the installation of rainwater harvesting systems to capture stormwater from building roofs for the purpose of reuse for irrigation (i.e. - rain barrels for residential use and cisterns for larger developments);
- the use of vegetated roofs (green roofs) to detain, absorb, and reduce the volume of roof runoff; and
- Development of a long-term pollution prevention plan, including measures to reduce the introduction of pollutants to the environment post-construction

Better Site Design (BSD)

BSD is a set of techniques established by a national planning roundtable that offers to municipalities, designers, and developers guidance to employ a variety of methods to a) reduce total paved areas, b) distribute and diffuse stormwater; and c) conserve natural habitats. To meet the goals associated with the nearly two dozen BSD techniques, designers need to carefully review every aspect of a specific site plan – its streets, parking spaces, setbacks, lot sizes driveways and sidewalks – to see if any elements can be reduced in scale, while incorporating innovative site grading and drainage techniques to reduce stormwater runoff and promote infiltration.
Conservation of natural areas techniques include stream buffers, clearing and grading, tree conservation and stormwater treatment. The town may realize the most success of employing these techniques by offering developers both flexibility and incentives.

- Create a naturally vegetated buffer system along Sodom Brook that also encompasses critical environmental features such as 100 –year floodplains, steep slopes and freshwater wetlands. Buffers are noted for their water quality value

and enhancing the quality of life of area residents. Buffers area also noted for their economic benefits, including those associated with increased property values, reduced flood damages, and sediment removal costs. A model stream buffer ordinance and regional examples can be downloaded from the Center for Watershed Protection at www.cwp.org.

- The riparian stream buffer should be preserved or restored with native vegetation. It is critical that the buffer system be maintained through the plan review delineation, construction and post-construction phases.
- Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots, allow access, and provide for fire protection. A fixed portion of any community open space should be managed as protected green space in a consolidated manner.
- Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and conserving native vegetation. Wherever practical, incorporate trees into community open space, streets rights-of-way, and other landscaped areas. Maintaining forested lots rather than tree removal will support the dual purpose of stabilizing the landscape reducing the potential for severe erosion and reducing ambient stream temperatures.
- Incentives and flexibility should be encouraged to promote conservation of stream buffers, forests, meadows, and other areas of environmental value
- New stormwater outfalls should not discharge unmanaged stormwater into jurisdictional wetlands or sensitive areas.
- More detailed information on LID site design can be found in the Prince George's County Low-Impact Development Design Strategies: An Integrated Design Approach Manual at: http://www.epa.gov/owow/nps/lid/lidnatl.pdf.

Determination of Open Space

In determining a specific 100 acres of the property to be preserved from an LID perspective, it is recommended that the first step in the planning process is to determine which areas should not be developed (i.e. wetlands, vernal pools, riparian areas, stream buffers, floodplains, steep slopes, ridgeline protection areas etc.). Specifically, this includes prioritizing the preservation of unfragmented habitat, wetlands, and associated upland areas. It would also be helpful to utilize the following site design strategies:

- Minimize site disturbance by limiting construction activities to areas that will contain buildings or roads.

- Reduce the limits of clearing and grading to minimize runoff potential

- Use existing site drainage and hydrology as a design element – conduct a hydrologic analysis to determine which techniques are necessary for replicating pre-development hydrology (runoff volume, peak runoff, frequency, and water quality control)

- Determine traffic patterns and road networks after locating buildings to minimize impervious surfaces

- Draw lot lines last to reflect the natural attributes of the site

- The Soil Erosion and Sediment Control Act requires that guidelines be developed to minimize soil erosion and sedimentation on construction sites. The Department particularly recommends erosion control measures in upland areas with steep slopes, to minimize transport of material above and below the construction zone. It is recommended that an erosion and sediment control plan be implemented that meets or exceeds the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control* (http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325660&depNav_GID=1654).

- The proposed construction site is greater than 10 acres, thus a Stormwater Pollution Control plan must be prepared and submitted to the DEP. This includes applying for a *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* (http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324154&depNav_GID=1643#StormConstructGP).

- Meriden should consider requesting practical and feasible alternative site plan design(s) to accommodate flexible subdivision, protection of priority natural resources, and lot layout and configuration to protect the integrity of Sodom Brook and the associated riparian/wetland area.

- Meriden can apply for active assistance from the University of Connecticut's Cooperative Extension System's Nonpoint Education for Municipal Officials (NEMO) program towards revisions of the town regulations for effective stormwater quality management.

- In general consideration, the City should consider stormwater filtering practices such as bioretention areas and other appropriate technology to promote bacteria removal.

Contact Jessica Morgan, the CT DEP LID Coordinator, at 860-418-5994 or jessica.morgan@ct.gov for more information and /or resources on LID site design and stormwater BMPs.

Potential Water and Watershed Issues and Recommendations

In summary, the major concerns from a water resources perspective include:

- preservation the of sensitive headwaters and buffer areas along Sodom Brook to protect downstream resources
- encouraging infiltration, where appropriate, to maintain baseflow and to reduce or prevent pollutant loads from new development
- ensuring that soils used for infiltration are not compacted due to previous or future development
- addressing the 2008 Bacteria TMDL for the Quinnipiac Regional Watershed Basin.

As there may be limited capacity for infiltration of stormwater in the soils on site, it is recommended that:

- Rainwater harvesting and reuse and/or green roofs be utilized to manage stormwater in areas where soils are not suitable for infiltration
- Open space be incorporated into any new development through better site design techniques, in addition to the initial 100 acres of protected land.

References

Anisfeld S. and Zajac, R. 2000. *Quinnipiac River Watershed Water Quality/Quantity and GIS Assessment*. Final Report for §319 Project 98-04 for Connecticut Department of Environmental Protection.

Fritz, K.M., Johnson, B.R., and Walters, D.M. 2006. *Field Operations Manual for Assessing the Hydrologic Permanence and Ecological Condition of Headwater Streams*. EPA/600/ R-06/126. U.S. Environmental Protection Agency, Office of Research and Development, Washington DC. http://www.epa.gov/eerd/manual/headwater/HISSmanual-cover.pdf.

Southwest Conservation District Review

This soils report applies to the 289-acre parcel located in the north central portion of the City and abutting the more rural sectors of the Town of Berlin. The information in this report is based on the historical soils series descriptions and the new digital mapping unit descriptions as presented in the Soil Survey of Connecticut, remote survey interpretations plus field observations.

Exhibit #1 (CT Soils Mapping) are derived from the new digital survey (Soil Survey of Connecticut). The soil survey utilizes recent aerial photographic base with one soil legend, which employs the numbering convention used by the USD A. Also this site can be found in sheet number 69 of the New Haven County Survey.

Mapping Units

Wetland Soils

1) USDA Soil #17 - Timakwa and Natchaug - aka: Map Unit AA - Adrian & Palm soils

This map unit consists primarily of Adrian and Palm soils on 0 to 3 percent slopes. Adrian soils are very deep and very poorly drained. Typically, these soils have an organic layer 16 to 51 inches thick. The underlying layer is of a sandy or loamy texture to a depth of 60 inches or more. These soils have a watertable within 12 inches of the soil surface.

2) USDA Soil#12 -Map Unit Rb-Raypol

This map unit consists primarily of Raypol soils on 0 to 3 percent slopes. Raypol soils are very deep, poorly drained soils, formed in loamy over sandy and gravelly glacial outwash deposits. These soils have a watertable within 1.5 feet of the surface much of the year. Typically, they have a silt loam, very fine sandy loam surface layer and subsoil over a stratified and gravel substratum that extends to a depth of 60 inches or more.

3) USDA Soil#6 –Map Unit WT- Wilbraham - Menlo

These soils are so intermingled on the ground that they could not be separated on the map. Both soils formed in dense basal till in drainageways and depressions.

The Wilbraham soils are very deep and poorly drained. Typically, they have loam or very fine sandy loam textures to a depth of 60 inches or more. These soils have low chroma mottles throughout the subsoil layers.

The Menlo soils are deep and very poorly drained. Typically, they have an organic surface layer overlying fine sandy loam, loam, or silt loam materials to a depth of 60 inches or more.

National Wetlands Inventory Mapping - Exhibit *#2*

Vernal Pools - Omitting the NRG Site and Staging Area, site walks and evidence of perched watertables, drainageways and depressions through out the site may warrant a field

study to qualify and quantify potential vernal pools on site. The ground-truthing of potential vernal pools in the surrounding uplands should be considered to investigate, inventory and determine enhanced buffering distances to limit their disturbance and preserve the viability of these pools and their associated upland environments.

Wetland Crossings and Trails - Upland trails leading to the wetlands require greater buffering distances, erosion and siltation control and less intrusive walkways across wetland areas. Active recreation such as mountain biking should be relegated to specific areas to cross any wetlands or watercourses on site. Minimize the size of the crossing, provide hard armoring of the crossing and stabilize the upslope area leading to these crossing.

Observation

- Wetland Disturbance - Evidence of ATV traffic and damage was observed in and around these wetlands.
- Buffering - Possible pull back of the trail and creation of a single observation point off the Spur to Blue Trail away from the vernal pool located near the fire / access road should be considered.

Note

Adequate buffering of wetlands and upslope habitats critical to vernal pool viability should be reassessed due to major disturbances of these environments in the past. Guidance on these issues can be obtained from MCA Technical Paper NO. 5, *Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States*, authored by Michael W. Klemmens, Ph.D. and Aram Calhoun, Ph.D.

Non-wetland Soils

4) USDA Soil # 30B - Map Unit BoB - Branford silt loam, 3 to 8 percent

Branford soils are very deep, well drained soils that formed in loamy over sandy and gravelly glacial fluvial deposits, derived mainly from red Triassic rocks. Typically, they have a fine sandy loam, loam, or silt loam surface layer and subsoil over a stratified sand and gravel substratum that extends to a depth of 60 inches or more. Permeability is moderate or moderately rapid in the surface layer and subsoil, and very rapid in the substratum. **The very rapid permeable substratum requires that care be taken in some areas to prevent pollution of the ground water.** Surface runoff is medium and the erosion hazard is moderate.

These soils constitute a very limited portion of this parcel, which is located in the southeastern sector along the eastern boundary.

5) USDA Soil *# 11C* - Map Unit CyC - Cheshire Holyoke complex

The CyC map unit complex consists primarily of two dominant soils that are so intermingled that they could not be separated on the map. Slopes range from 3 to 15 percent. Both soils have medium to rapid runoff. This soil type is found in the northern reaches of the parcel trending just east and in the same direction as the easement. It constitutes about 3.8% of the parcels usable soil types, which is approximately 14.4-acres in size.

The first soil is named Cheshire. Cheshire soils are well drained, very deep to bedrock soils. Typically, they have a fine sandy loam, loam or silt loam surface layer and a subsoil over a friable sandy loam, fine sandy loam substratum that extends to a depth of 60 inches or more. This soil has moderate permeability. This soil has a **fair potential for community development.** It is limited mainly by the steepness of slopes and stoniness

The Holyoke soil component is limited in its depth to bedrock of 10 to 20 inches. This soil is droughty and has a **severe erosion hazard** and a moderate tree windthrow due to the shallow root zone. This soil component has a **poor potential** for community development due to its shallow depth to bedrock.

E&S Controls
During construction, enhanced construction measures such as temporary vegetation and silt basins are frequently needed to prevent excessive runoff erosion and siltation.

6) USDA Soil #78C - Map Unit HyC - Holyoke-Rock outcrop complex, 3 to 15 % slopes. USDA Soil #78E - Map Unit HyC - Holyoke-Rock outcrop complex, 15 to 45% slopes.
The HyC map unit complex consists primarily of two dominant soils that are so intermingled that they could not be separated on the map. Both soils have medium to rapid runoff.

The first soil is named Cheshire. Cheshire soils are well drained, very deep to bedrock soils. Typically, they have a fine sandy loam, loam or silt loam surface layer and a subsoil over a friable sandy loam, fine sandy loam substratum that extends to a depth of 60 inches or more. This soil has moderate permeability.

The Holyoke soil component is limited in its depth to bedrock of 10 to 20 inches. This soil is droughty and has **severe erosion hazard** and a moderate tree windthrow due to the shallow root zone.

7) **USDA Soil # 79E - Map Unit HZE - Holyoke-Rock outcrop complex, slopes range from 15 to 45 percent.**
The HZE complex consists of moderately steep-to-steep, well drained to somewhat well drained soils on uplands. The Holyoke component is a well drained, shallow to bedrock soil. Typically, they have a loam, silt loam or fine sandy loam surface layer and subsoil over hard bedrock at a depth of 10 to 20 inch depth.

If these soils are disturbed, they require intensive conservation measures, such as mulching, reestablish vegetative cover and diffuse surface runoff to control excessive runoff, erosion and siltation.

The bedrock is hard, unweathered Basalt: The surficial material is predominantly a thin upper till less than 10 to 15" thick over bedrock. The till is loose to moderately compact, generally sandy and commonly stony.

General Soil Note

Group D - Hydrologie Soil Group - 92.5% of the soils on site fall into this category. In order to attain sufficient infiltration and recharge while protecting down slope environments, the assessment and evaluation of runoff treatment has to be enhanced. This is due to the soil characteristics of very slow infiltration rate associated with shallow soils over nearly impervious material. See Exhibit #3.

Stormwater Management / Raw Water Renovation

Runoff From Increased Impervious Surface / Nonpoint Source Pollution - Soil types 5 thru 7 dominate the landscape. The increase in impervious surface from proposed building footprints and road systems might exacerbate the already tenuous flooding problem in the City of Meriden. Careful design parameters to meet a zero increase in runoff under severe conditions would be prudent and is highly recommended in an effort to eliminate any contributory effects from flooding and degradation of water quality to Sodom Brook.

Water Quality / Runoff Renovation

Runoff from impervious surfaces like the proposed road system and the addition of parking lots will entrain a wide array of non-point source pollutants. Pretreatment of runoff prior to discharge should be integral to the overall stormwater infrastructure design. This would require the utilization of hooded, solid separators or equivalent apparatus to perform adequate sequestering of solids and trapping of floatables, then a multi-cell stormwater basin to increase raw water quality prior to discharge to Sodom Brook. **The difficulty of installing and implementing BMP's that address raw water renovation is made more difficult with the influence of underlying bedrock throughout this site.**

Siting of Structures & Road System - The preliminary layout and footprint of the proposed development on site seems to be quite spread out and further fragments large tracts of land that appear to be some what contiguous at this time. Consolidation of buildings, driveways and parking will reduce infrastructure cost, impervious surface, provide easier access and gain more open space.

Ground Water Contamination - The potential land disturbances on these steep upslope environments pose a significant treat to watercourses and the public water supply of Mule Well operated by the Meriden Water Department on Bailey Avenue, which should prompt careful consideration regarding the following items:

a. Staging of and refueling of equipment plus hazardous wastes on-site.

b. Storage and 125% spill containment capabilities should be demonstrated in the Pollution Prevention Plan for construction activities.

c. Underground Storage Tanks (UST's) installation or alternate heating fuels should be explored.

Hydrology

The proposed site lies in the Sodom Brook Subbasin (Hydrologic Unit #5205) of the Quinnipiac Regional Basin. Ground water and surface water classifications are as follows:

- B/A - Sodom Brook overall surface water quality classification. Unclear as to water quality in the immediate area and up stream of the proposed project.
- GAA - Mule Well ground water quality classification. This well is located approx. 500' SW of Bailey Ave. This area is hydraulically linked to a significant portion of this site.

Note: This information is from a 1987 data set and mapping from DEP Water Resources. The Meriden Water Authority can provide more up to date classifications and provide additional insight into measures to protect the wellhead and project adequate setback zones of influence.

NRG Site / Related Disturbances / Alternate Plan

The current footprint of the NRG site, easement and staging areas is approx. 24-acres within the City's limits. Consideration should be given to reconfiguring the site to serve as a **wind powered generation facility** that uses the prevailing winds and current orientation relative to the mountainside. A facility of this type would be no more intrusive in this reviewer's opinion than the current number of cell towers and 345 KV power lines bisecting all of southwest Connecticut's landscape.

This alternate generation option would provide the needed services to the community and dramatically enhance the balance of economic needs with the preservation and conservation of our natural resources. Reconfiguring the existing site would provide the following benefits:

- Eliminate the negative affects of massive water diversions from water from the CT River.
- Minimize further natural resource losses along the proposed (several mile) easement to bring water from the Connecticut River to the facility plus disturbances to convey the discharge to the Quinnipiac River. Limiting land disturbances reduces erosion and siltation, which directly impacts runoff water quality and degrades or destroys terrestrial and aquatic habitats along its entire length. These threats and losses were evident in the recent expansion of the R.O.W. for the 345 KV line running from Middletown to Norwalk.
- Eliminate the threat of a potential thermal increase to the waters of the Quinnipiac River.
- Preserve the ridgeline and its flyway environment for migrating birds and raptors.

Note:
Green Technologies - Currently, the government is promoting the use of green technologies, which
may have funds to subsidize this type of effort.

Open Space / Wildlife Corridor

In an effort to preserve the connectivity of open space with the upper reaches of this parcel and the 55-acre Bailey Avenue land, eliminate the proposed roadway, associated infrastructure, the 75,000 sq/ft bldg, Age Restricted Housing and Single Family Homes that would run parallel to the existing trail connection from the Bailey Ave. Open Space to the Boys & Girls Club Trail plus development.

Siting Concerns:

- This northeast sector of the site possesses soils and topography that is extremely limiting and difficult to develop due to steepness of slope and shallowness depth to bedrock.
- Installation, cost and maintenance of infrastructure, roadways and utilities would be excessive for nominal returns on tax generation.

Wildlife Considerations

Wildlife habitat on the site includes mixed hardwood forest 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 open fields, providing small conifer patches, encouraging certain tree species and placing bluebird boxes at the edges of the fields. Controlling unwanted pioneer and invasive species of plants such as autumn olive and multiflora rose would allow for easier management of these properties and provide more opportunity to enhance the area with beneficial native species.

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 includes deer, fox, raccoon, gray squirrel, woodpeckers (pileated, hairy and downy), 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, swamps and small marsh areas. Associated vegetation includes red maple, birch, alder, cattails, dogwood, jewel-weed, spicebush, sweet pepper bush, skunk cabbage, duckweed and various grasses and sedges. Signs of wildlife using these areas include deer, fox and raccoon. Other creatures utilizing these areas are skunks, cedar waxwings, titmice, woodpeckers, wood ducks and numerous amphibians and reptiles, including water and garter snakes, salamanders, newts, spotted and painted turtles.

Management Techniques: 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. Options to optimizing wildlife habitat could include well-mixed upland / forest stands, edge habitats with successional vegetation and open fields. Creating a variety of areas with

successional stage vegetation, maintaining openings along field borders will sustain your biodiversity and the health of the natural resources on site as a whole.

- Guidance on developing a sound forestry management plan can be obtained by contacting the CT DEP Forestry Division, Robert Rocks at Eastern District Headquarters, 209 Hebron Road, Marlborough, CT.

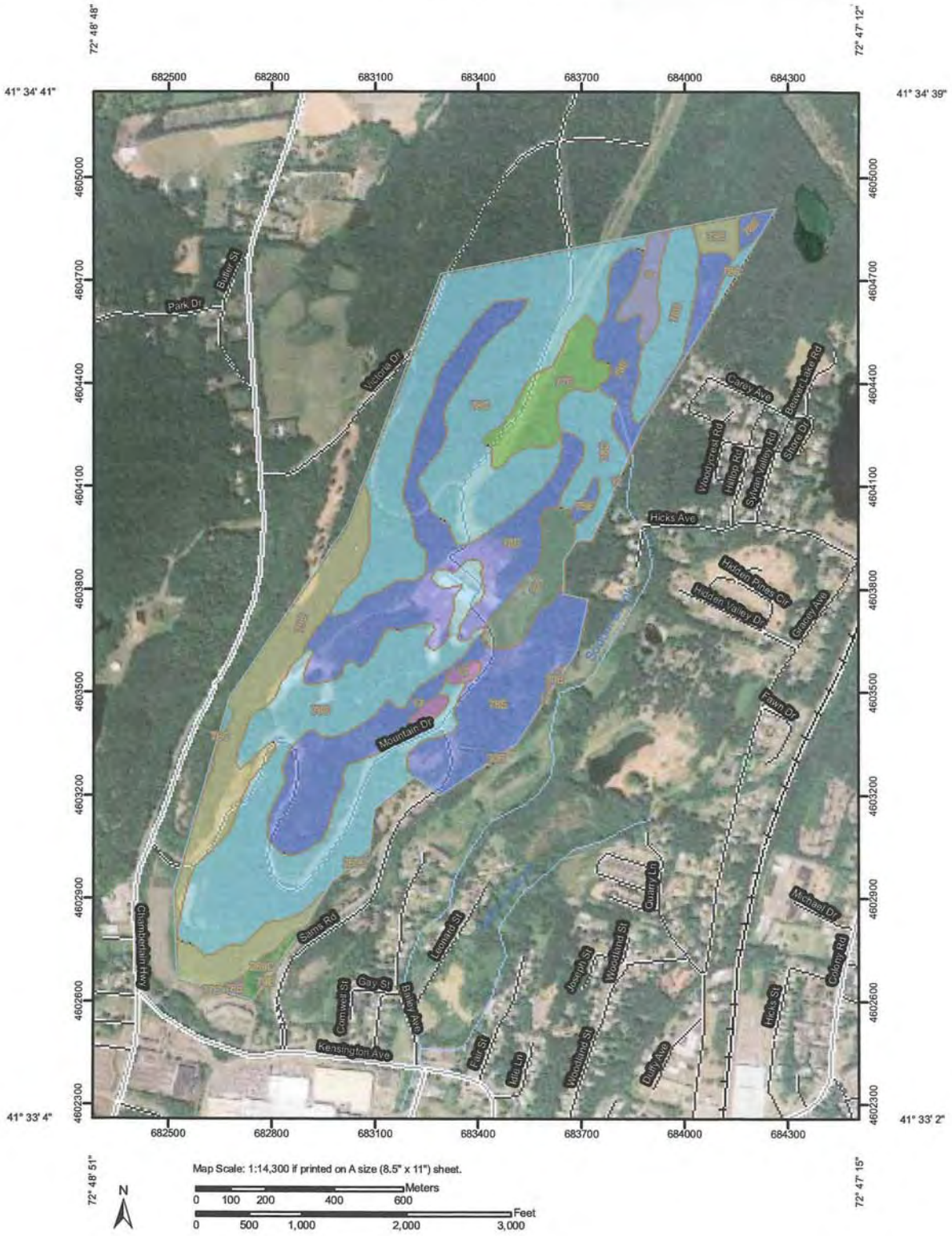
Natural Resource History / Education Trails

Trails are the key to bringing people and wildlife together. Trail systems 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 passive 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 increases awareness, allows the general public to appreciate a particular animal, plant or habitat and its ecological value and fosters a stewardship of our natural resources that will serve our communities for generations to come.

- Guidance on developing a trail system can be obtained by contacting the CT Forest and Parks Association located on RT 66 in Middlefield, CT.

Several federal and state programs offered by the USDA / NRCS are available with cost share options to many town Land Trusts to facilitate and enhance long-term land management plans for agricultural, open space preservation and wildlife habitat improvement. For more information regarding these programs please contact Richard Ksyztyniak, (203) 269-7509, Ext.203, District Conservationist for the US Department of Agricultures, Natural Resources Conservation Service at 900 Northrop Rd., Suite A, Wallingford, CT 06492.

Map Unit Name—State of Connecticut



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- Branford silt loam, 3 to 8 percent slopes
- Cheshire-Holyoke complex, 3 to 15 percent slopes, very rocky
- Holyoke-Rock outcrop complex, 15 to 45 percent slopes
- Holyoke-Rock outcrop complex, 3 to 15 percent slopes
- Raypol silt loam
- Rock outcrop-Holyoke complex, 3 to 45 percent slopes
- Timakwa and Natchaug soils
- Udorthents-Pits complex, gravelly
- Wilbraham and Menlo soils, extremely stony
- Yalesville-Urban land complex, 8 to 15 percent slopes
- Not rated or not available

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:14,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 6, Mar 22, 2007

Date(s) aerial images were photographed: 8/13/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Name

Map Unit Name— Summary by Map Unit — State of Connecticut				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
6	Wilbraham and Menlo soils, extremely stony	Wilbraham and Menlo soils, extremely stony	5.2	1.4%
12	Raypol silt loam	Raypol silt loam	0.3	0.1%
17	Timakwa and Natchaug soils	Timakwa and Natchaug soils	2.6	0.7%
30B	Branford silt loam, 3 to 8 percent slopes	Branford silt loam, 3 to 8 percent slopes	0.6	0.2%
77C	Cheshire-Holyoke complex, 3 to 15 percent slopes, very rocky	Cheshire-Holyoke complex, 3 to 15 percent slopes, very rocky	14.4	3.8%
78C	Holyoke-Rock outcrop complex, 3 to 15 percent slopes	Holyoke-Rock outcrop complex, 3 to 15 percent slopes	187.2	49.0%
78E	Holyoke-Rock outcrop complex, 15 to 45 percent slopes	Holyoke-Rock outcrop complex, 15 to 45 percent slopes	118.4	31.0%
79E	Rock outcrop-Holyoke complex, 3 to 45 percent slopes	Rock outcrop-Holyoke complex, 3 to 45 percent slopes	39.8	10.4%
269C	Yalesville-Urban land complex, 8 to 15 percent slopes	Yalesville-Urban land complex, 8 to 15 percent slopes	2.8	0.7%
305	Udorthents-Pits complex, gravelly	Udorthents-Pits complex, gravelly	10.6	2.8%
Totals for Area of Interest			**382.1**	**100.0%**

Description

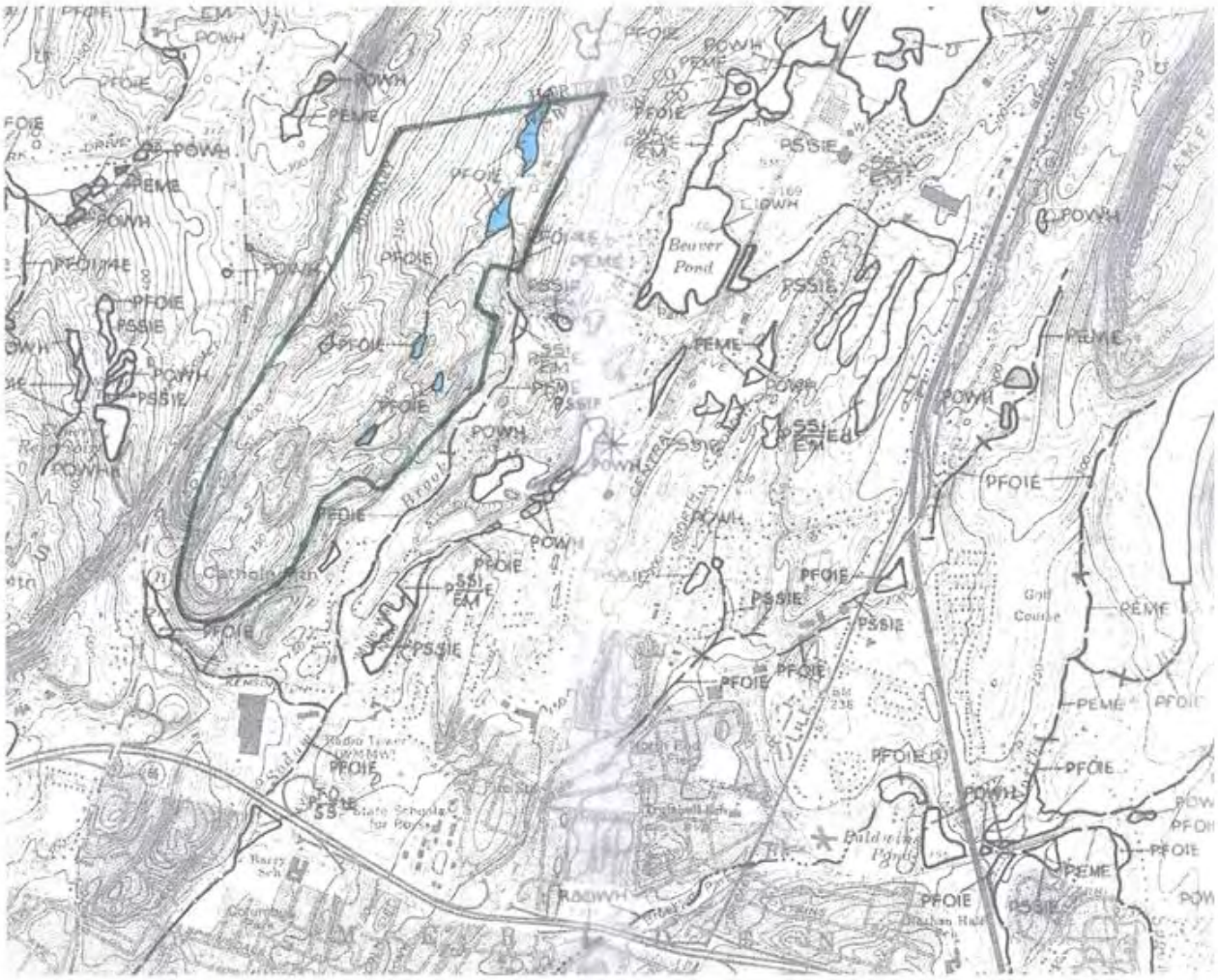
A soil map unit is a collection of soil areas or nonsoil areas (miscellaneous areas) delineated in a soil survey. Each map unit is given a name that uniquely identifies the unit in a particular soil survey area.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Exhibit # 2: National Wetland Inventory Mapping

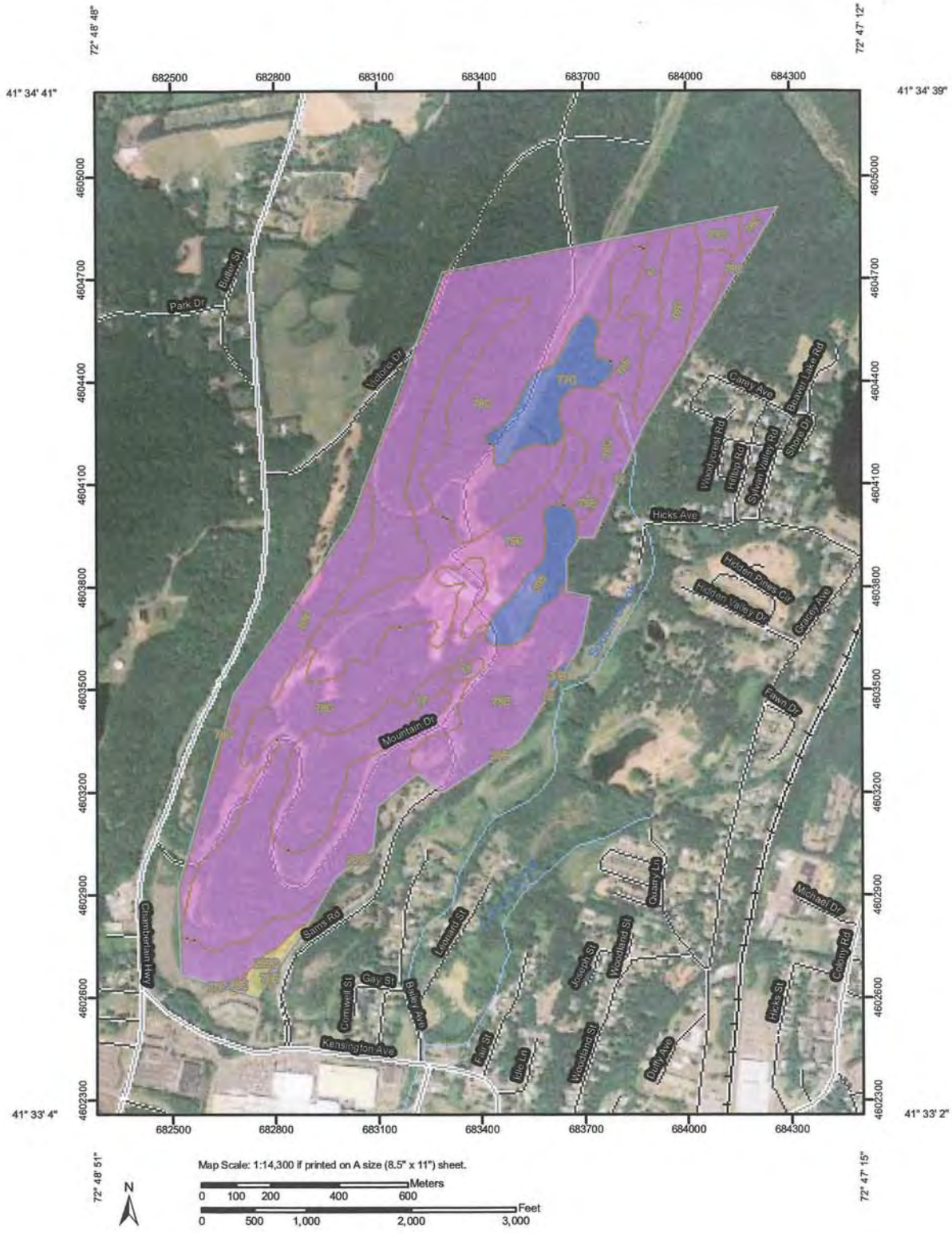


Wetland Legend

PFOIE

- Palustrine
- Forested
- Broad Leaved Deciduous
- Seasonal Saturated

Hydrologic Soil Group—State of Connecticut



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:14,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 6, Mar 22, 2007

Date(s) aerial images were photographed: 8/13/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — State of Connecticut				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6	Wilbraham and Menlo soils, extremely stony	D	5.2	1.4%
12	Raypol silt loam	D	0.3	0.1%
17	Timakwa and Natchaug soils	D	2.6	0.7%
30B	Branford silt loam, 3 to 8 percent slopes	B	0.6	0.2%
77C	Cheshire-Holyoke complex, 3 to 15 percent slopes, very rocky	B	14.4	3.8%
78C	Holyoke-Rock outcrop complex, 3 to 15 percent slopes	D	187.2	49.0%
78E	Holyoke-Rock outcrop complex, 15 to 45 percent slopes	D	118.4	31.0%
79E	Rock outcrop-Holyoke complex, 3 to 45 percent slopes	D	39.8	10.4%
269C	Yalesville-Urban land complex, 8 to 15 percent slopes	C	2.8	0.7%
305	Udorthents-Pits complex, gravelly	B	10.6	2.8%
Totals for Area of Interest			**382.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area (South Mountain Road area formerly known as the NRG site) in Meriden, Connecticut have been reviewed. According to our information, there are records for State Special Concern *Terrapene carolina carolina* (box turtle), *Ambystoma jeffersonianum* (Jefferson salamander "complex") and *Thamnophis sauritus* (eastern ribbon snake) from the vicinity of this project site.

The Jefferson salamander "complex" results in the hybridization of the blue-spotted salamander with the Jefferson salamander. The hybrids can only be reliably distinguished by karyological (pertaining to the number or structure of chromosomes) and biochemical analyses. Jefferson salamanders prefer steep, rocky areas with rotten logs and a heavy duff layer. They are found in or near undisturbed second growth deciduous forests and their breeding pools may be in hemlock groves or grassy pasture ponds. Jefferson salamanders are not found in nor do they tolerate radically disturbed habitats. Surveys should done if the area has any woods with rotten logs and duff layers, breeding pools or ponds. They actively breed from February – April and should be surveyed for from February to April by rock and log turning, night lighting or looking along any roads at night.

Eastern box turtles require old field and deciduous forest habitats, which can include power lines and logged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semi aquatic, and hibernate on land by digging down in the soil from October to April. They have an extremely small home range and can usually be found in the same area year after year. This species is dormant from November 1 to April 1. It has been negatively impacted by the loss of suitable habitat.

Eastern ribbon snakes inhabit areas with shallow water, grassy or shrubby areas bordering streams and wooded swamps. They also prefer sunny areas with low dense vegetation near shallow water areas. Their diet consists of insects, fish, frogs, salamanders and toads.

If work will be conducted in any Eastern box turtle, ribbon snake or Jefferson salamander habitat, the Wildlife Division recommends that a herpetologist familiar with the habitat requirements of these herptiles conduct surveys. A report summarizing the results of such surveys should include habitat descriptions, reptile and amphibian species list and a statement/resume giving the herpetologist's qualifications. The DEP doesn't maintain a list of qualified herpetologists. The results of this investigation can be forwarded to the Wildlife division and, after evaluation, recommendations for additional surveys, if any, will be made.

Please be advised that this section of the Wildlife division has not made a field inspection of the project area nor have they seen detailed timetables for any work to be done. Consultation with the Wildlife Division should not be substituted for site specific surveys

that may be required for environmental assessments. The time of year when this work may take place will affect the species if they are present on the site when the work is scheduled. Please be advised that should state permits be required or should state involvement occur in some other fashion, specific restrictions or conditions relating to the species discussed above may apply. In this situation, additional evaluation of the proposal by the DEP Wildlife Division should be requested. If the proposed project has not been initiated within 6 months of this review, contact the Natural Diversity Data Base for an updated review.

Additional questions can be directed to Julie Victoria at Julie.Victoria@ct.gov, and please reference the NDDB #17024.

In addition, the following four state listed plant species have been reported from this site:

1. *Carex squarrosa* (a sedge): State Special Concern; Date last observed: 1994

2. *Carex hitchcockiana* (Hitchcock's sedge): State Special Concern; Date last observed: 1988

3. *Diplazium pycnocarpon* (narrow-leaved glade fern): State Endangered, Date last observed: 1873-Historic. The habitat for this species is rich wooded slopes, ravines and swampy woods and thickets.

4. *Dicentra Canadensis* (squirrel corn): State Threatened; Date last observed: 1943-Historic. This species is proposed to be reclassified to State Special Concern as part of the 2009 update to the CT State Endangered Species List. The habitat for this species is rich, moist soils, frequently among rocks on wooded trap-rock talus slopes.

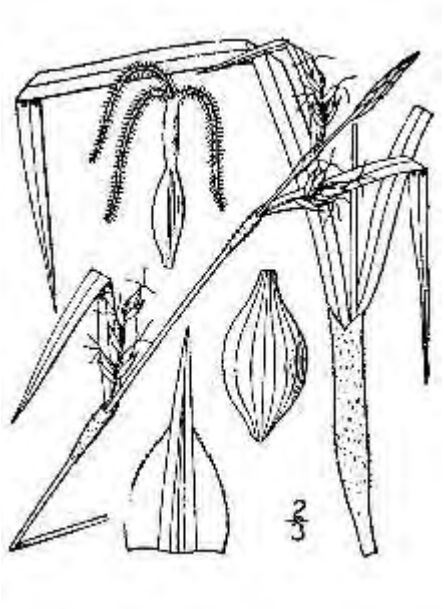
The NDDB program botanist, Ms. Nancy Murray (DEP-Inland Fisheries; 860-424-3589; nancy.murray@ct.gov) recommends that the site be surveyed for these species to determine if they are still present at this site. A report summarizing the results of the survey should include habitat descriptions, vascular plant species with special notes on the presence or absence of the state-listed species and a resume giving the botanist's qualifications. The report should be sent to Ms. Nancy Murray. Please contact Ms. Murray if you have further questions regarding these state-listed plants.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Environmental Protection's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for

environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Carex hitchcockiana Dewey
Hitchcock's sedge

Symbol:	CAHI8
Group:	Monocot
Family:	Cyperaceae
Duration:	Perennial
Growth Habit:	Graminoid
Native Status:	L48 N CAN N



Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 405.
Courtesy of Kentucky Native Plant Society. Scanned by Omnitek Inc. Usage Requirements.

Carex squarrosa L.
squarrose sedge

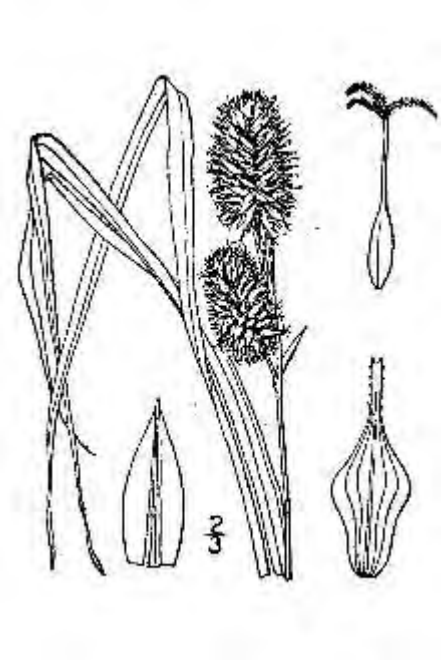
Symbol:	CASQ2
Group:	Monocot
Family:	Cyperaceae
Duration:	Perennial
Growth Habit:	Graminoid
Native Status:	L48 N CAN N

Click on the image below to enlarge it and download a high-resolution JPEG file.

Robert H. Mohlenbrock. USDA SCS. 1989. *Midwest wetland flora: Field office illustrated guide to plant species*. Midwest National Technical Center, Lincoln. Courtesy of USDA NRCS Wetland Science Institute. Usage Requirements.

Carex squarrosa L.
squarrose sedge

Symbol:	CASQ2
Group:	Monocot
Family:	Cyperaceae
Duration:	Perennial
Growth Habit:	Graminoid
Native Status:	L48 N CAN N



Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 438.

Diplazium pycnocarpon (Spreng.) Broun
glade fern

Symbol:	DIPY
Group:	Fern
Family:	Dryopteridaceae
Duration:	Perennial
Growth Habit:	Forb/herb
Native Status:	L48 N CAN N

Asplenium pycnocarpon

Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 28. Courtesy of Kentucky Native Plant Society. Scanned by Omnitek Inc. Usage Requirements.

Dicentra canadensis (Goldie) Walp.
squirrel corn

Symbol:	DICA
Group:	Dicot
Family:	Fumariaceae
Duration:	Perennial
Growth Habit:	Forb/herb
Native Status:	L48 N CAN N

Bicuculla canadensis

Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 2: 142.
Courtesy of Kentucky Native Plant Society. Scanned by Omnitek Inc. Usage Requirements.

Connecticut Department of Environmental Protection

Eastern Box Turtle

Terrapene carolina carolina

State Species of Special Concern

Description
The eastern box turtle is probably the most familiar of the 8 species of turtles found in Connecticut's landscape. It is known for its high-domed carapace (top shell). The carapace has irregular yellow or orange blotches on a brown to black background that mimic sunlight dappling on the forest floor. The plastron (under shell) may be brown or black and may have an irregular pattern of cream or yellow. The length of the carapace usually ranges from 4.5 to 6.5 inches, but can measure up to 8 inches long. The shell is made up of a combination of scales and bones, and it includes the ribs and much of the backbone.

Each individual turtle has distinctive head markings. Males usually have red eyes and a concave plastron, while females have brown eyes and a flat plastron. Box turtles also have a horny beak, stout limbs, and feet that are webbed at the base. This turtle gets its name from its ability to completely withdraw into its shell, closing itself in with a hinged plastron. Box turtles are the only Connecticut turtle with this ability.

Range
Eastern box turtles are found throughout Connecticut, except at the highest elevations. They range from southeastern Maine to southeastern New York, west to central Illinois, and south to northern Florida.

Habitat and Diet
In Connecticut, this terrestrial turtle inhabits a variety of habitats, including woodlands, field edges, thickets, marshes, bogs, and stream banks. Typically, however, box turtles are found in well-drained forest bottomlands and open deciduous forests. They will use wetland areas at various times during the season. During the hottest part of a summer day, they will wander to find springs and seepages where they can burrow into the moist soil. Activity is restricted to mornings and evenings during summer, with little to no nighttime activity, except for egg-laying females. Box turtles have a limited home range where they spend their entire life, ranging from 0.5 to 10 acres (usually less than 2 acres).

Box turtles are omnivorous and will feed on a variety of food items, including earthworms, slugs, snails, insects, frogs, toads, small snakes, carrion, leaves, grass, berries, fruits, and fungi.

Life History
From October to April, box turtles hibernate by burrowing into loose soil, decaying vegetation, and mud. They tend to hibernate in woodlands, on the edge of woodlands, and sometimes near closed canopy wetlands in the forest. Box turtles may return to the same place to hibernate year after year. As soon as they come out of hibernation, box turtles begin feeding and searching for mates.

The breeding season begins in April and may continue through fall. Box turtles usually do not breed until they are about 10 years old. This late maturity is a result of their long lifespan, which can range up to 50 to even over 100 years of age. The females do not have to mate every year to lay eggs as they can store sperm for up to 4 years. In mid-May to late June, the females will travel from a few feet to more than a mile within their home range to find a location to dig a nest and lay their eggs. The 3 to 8 eggs are covered with dirt and left to be warmed by the sun. During this vulnerable time, skunks, foxes, snakes, crows, and raccoons often raid nests. Sometimes, entire nests are destroyed. If the eggs survive, they will hatch in late summer to early fall (about 2 months after being laid). If they hatch in the fall, the young turtles may spend the winter in the nest and come out the following spring.

As soon as the young turtles hatch, they are on their own and receive no care from the adults. This is a dangerous time for young box turtles because they do not develop the hinge for closing into their shell until they are about 4 to 5 years old. Until then, they cannot entirely retreat into their shells. Raccoons, skunks, foxes, dogs, and some birds will prey on young turtles.

Conservation Concerns
The eastern box turtle was once common throughout the state, mostly in the central Connecticut lowlands. However, its distribution is now spotty, although where found, turtles may be locally abundant. Because of the population decline in Connecticut, the box turtle was added to the state's List of Endangered, Threatened, and Special Concern Species when it was revised in 1998. It is currently listed as a species of special concern. The box turtle also is protected from international trade by the 1994 CITES treaty. It is of conservation concern in all the states where it occurs at its northeastern range limit, which includes southern New England and southeastern New York.

Many states have laws that protect box turtles and prohibit their collection. In Connecticut, eastern box turtles cannot be collected from the wild (DEP regulations 26-66-14A). Another regulation (DEP regulations 26-55-3D) "grandfathers" those who have a box turtle collected before 1998. This regulation limits possession to a single turtle collected before 1998. These regulations provide some protection for the turtles, but not enough to combat some of the even bigger threats these animals face. The main threats in Connecticut (and other states) are loss and fragmentation of habitat due to deforestation and spreading suburban development; vehicle strikes on the busy roads that bisect the landscape; and indiscriminate (and now illegal) collection of individuals for pets.

Loss of habitat is probably the greatest threat to turtles. Some turtles may be killed directly by construction activities, but many more are lost when important habitat areas for shelter, feeding, hibernation, or nesting are destroyed. As remaining habitat is fragmented into smaller pieces, turtle populations can become small and isolated.

Adult box turtles are relatively free from predators due to their unique shells. The shell of a box turtle is extremely hard. However, the shell is not hard enough to survive being run over by a vehicle. Roads bisecting turtle habitat can seriously deplete the local population. Most vehicle fatalities are pregnant females searching for a nest site.

How You Can Help

- Leave turtles in the wild. They should never be kept as pets. Whether collected singly or for the pet trade, turtles that are removed from the wild are no longer able to be a reproducing member of a population. Every turtle removed reduces the ability of the population to maintain itself.
- Never release a captive turtle into the wild. It probably would not survive, may not be native to the area, and could introduce diseases to wild populations.
- Do not disturb turtles nesting in yards or gardens.
- As you drive, watch out for turtles crossing the road. Turtles found crossing roads in June and July are often pregnant females and they should be helped on their way and not collected. Without creating a traffic hazard or compromising safety, drivers are encouraged to avoid running over turtles that are crossing roads. Also, still keeping safety precautions in mind, you may elect to pick up turtles from the road and move them onto the side they are headed. Never relocate a turtle to another area that is far from where you found it.
- Learn more about turtles and their conservation concerns. Spread the word to others on how they can help Connecticut's box turtle population.

The production of this Endangered and Threatened Species Fact Sheet Series is made possible by donations to the Endangered Species-Wildlife Income Tax Checkoff Fund.
(5/08)

Connecticut Department of Environmental Protection

Jefferson Salamander Complex

(Ambystoma jeffersonianum complex)

IDENTIFICATION: Slender, wide head, long toes, brown coloration with silvery foxing on the sides of the body and legs. Tail flattened laterally. Medium to large size, adults 130-170 mm total length.

This salamander occurs west of the Connecticut River where it is localized in the upland areas of Litchfield County and northern Fairfield County. A second center of distribution is along the trap rock ridge system of the Central Connecticut Lowland. This salamander is very sensitive to habitat disturbance and fragmentation, and is undergoing a range-wide decline (Bogart and Klemens, 1997). It breeds in vernal pools and requires extensive tracts of forest surrounding these pools to survive. In Connecticut, the most vulnerable populations are those associated with the trap rock ridge system, with at least one well known population at Foxon, near New Haven, now extinct. Populations in Fairfield, New Haven, and Hartford Counties have also been severely reduced and stressed by habitat fragmentation.

Salamanders | Amphibians and Reptiles in Connecticut

Connecticut Department of Environmental Protection

Eastern Ribbon Snake

(Thamnophis s. sauritus)

IDENTIFICATION: A medium-size, very thin, brown snake with keeled dorsal scales. Three distinct longitudinal yellow stripes from the head to the tail tip, the lateral stripes are confined to the third and fourth dorsal scale rows. The venter ranges from yellow to red brown, the tail is very long. The head is distinctly bicolored, the area below the eyes and under the chin bright white. Females are considerably larger than males, adult total length 510-810 mm.

Ribbon snakes are found statewide, but their distribution is very spotty. They are undergoing a long-term decline in the Connecticut. This may be correlated with a reduction of their preferred habitat, open-canopy wet sedge meadows in Connecticut over the last fifty to seventy-five years. This reduction is a result of both draining wet meadows and impounding marshy areas to make ponds and reservoirs. In many parts of the state red maple swamps have replaced open wet meadows, though the recolonization of Connecticut by beaver may help restore the cycle of wet meadow formation. The eastern ribbon snake is considered a "Special Concern" species in Connecticut, and under Connecticut Code (Sec. 26-55-3-F) possession is limited to a single specimen.

Snakes | Amphibians and Reptiles in Connecticut

Landscape Ecologist Review

Comments

With the plan's mention (page 134) of corridors and linkages, is clear that some preliminary landscape ecological thinking already has been applied to the question of what constitutes high value natural areas. However, for three reasons, the ensuing rhetoric fails to get us where we need to be:

1. At this site, there is **competition for the same pieces of land** from many potential land uses (wildlife corridors; protection of state-listed [*i.e.*, endangered, threatened, and special concern] species; protection of special habitat [trap rock; vernal pools]; aesthetics of the regional hiking trail located just to the west of the property [?]; aesthetical concerns of people viewing the site from a distance; potential light industry development; and potential residential development).
   a. Competition means that choices will have to be made; but in making choices, visual aesthetics and/or logistical concerns related to the placement of potential development should be clearly separated from biological concerns.
   b. The first guideline "Generally, *exterior site areas* with substantial corridors (at least 250 feet in width) that *will promote habitat viability*" [emphasis added] doesn't necessarily make biological sense.
      i. Given that people don't like their viewshed to include evidence of development on ridgelines, and that it would be convenient to have a big block of development land in the center, the choice to put conservation land on the exterior of the parcel could be socially and economically desirable; however, in regard to the issue of habitat viability, indiscriminately putting conservation land on the exterior of the property has the potential to lessen habitat viability by fragmenting habitats.

2. While wildlife habitat corridors are mentioned (P. 134, 2009 Plan of Conservation and Development Update), there does not seem to be the recognition that for comprehensive conservation of high natural values, **the function of habitat corridors is to <u>connect</u> useful habitat. It is important to think about what habitat areas are being connected and why.**

   Corridors are used for various reasons:
   a. Some animals that roam over large areas use habitat corridors as safe pathways to get to larger blocks of the different types of habitat they require in daily life.
   b. Habitat corridors allow young animals to move to new blocks of habitat so they don't end up breeding with their close relatives.
   c. Habitat corridors also allow for seasonal movements.
   d. Corridors may enable populations of a small-sized species to remain connected across the landscape, each new generation living within and moving farther along the corridor, ultimately to connect with groups of more distantly-related individuals, thereby preventing inbreeding in the population.

3. Because of the **lack of site-specific data** on the rare plants, animal, and habitats known from the area, as well as the lack of data on use by other uncommon wildlife species that are among the many suffering from declining populations in Connecticut, **it is difficult to assess the trade-offs** between (A) protection of specific rare species and habitats and (B) protection of habitat connectivity at a spatial scale of value to those species that suffer from effects of habitat fragmentation.

Notable Site Attributes

1. Unfragmented Forest Habitat

In the highly-fragmented landscape of central Connecticut, there is a lack of large habitat blocks. This makes the South Mountain Road/NRG site valuable because it offers the opportunity to create a large, fairly contiguous habitat block by combining the forest on the site with (A) the undeveloped land also owned by the Town on the northeast border of the site, (B) the block of undeveloped habitat immediately to the north in the Town of Berlin, and (C) with land to the west to help keep the connectivity to the Hanging Hills area.

a. Large blocks of undeveloped habitat are generally thought to be of higher quality than small blocks because they allow for species that require large territories in addition to promoting population viability (by accommodating many individuals) of species that require smaller territories.

b. Further, large areas are more likely to contain a greater diversity of habitat features (*e.g.*, presence of water, natural openings, unusual plants, rock outcrops, forest features such as downed logs, cavity trees, and standing dead trees essential to many species of wildlife).

2. Potential for Undeveloped Land to Provide a Buffer to Metacomet Trail

The Metacomet Trail runs just to the west of the NRG property; and, from the hiker's point of view, it would be desirable to buffer the trail from any sights and sounds of development by not developing the northwestern boundary of the property.

3. Potential to provide Wildlife Corridors Where New Development Would Spoil the Unfragmented Portions of the Property

a. Corridors often are placed next to streams to serve the dual purpose of (1) offering wildlife access to water as they move across the landscape from one patch of habitat to another and (2) keeping the soil surface near the stream vegetated to protect water quality.

b. As inferred from the PoCD guidelines, a forested trail buffer also could serve as a wildlife corridor.

c. Models for suitable widths of wildlife corridor include:

i. When streamside buffers are used for wildlife habitat, recommended widths range from 30 feet to 660 feet, or more, depending on the species of wildlife the corridor is planned for.

ii. Looking to the future, in the face of changing landscape patterns and changing climates, where populations of plants and animals may need to be able to

relocate over time to survive, conservation biologists have recommended corridor widths of one kilometer to one mile (3280 - 5280 feet wide).

4. Presence of State-Listed Species and Habitats

On the State's Natural Diversity Data Base (NDDB) map, there are multiple "blobs" indicating state-listed species or habitats. (Although the circular shape of the blobs gives a mental picture that the species location is in the center, the purpose of the blobs is to alert people to the presence of listed species without making public the exact location; So, in fact, the species may be found anywhere within the blob.)

a. The blobs overlap and cover the entire site from the south boundary to slightly past the northern edge of the fenced electric plant.
   i. Within this area, two Special Concern species of sedge were observed (*Carex squarrosa* and *Carex typhina* [voucher specimen of *C. typhina* to be deposited the UCONN herbarium]).
b. There also is a blob to the north that takes in the northwest corner of the site.
c. The Team landscape ecologist did not search the blob areas thoroughly for plants; and doesn't know the degree to which other team members had time for intensive field survey for plants/animals.
d. *Dicentra canadensis* (listed) is a spring ephemeral (blooms early Spring and dies back by Summer), so it was not possible to search for this one.

5. Large pool in the forest west of the electric plant

a. This seems the likely breeding site of the Special Concern Jefferson Salamander, but Spring, not late Summer, is the proper time to look for evidence of breeding.
b. Although vernal pools are critical breeding habitat for Jefferson Salamanders, the adults of this species are terrestrial; thus for populations to survive, the terrestrial habitat around the pools must be protected.
   i. Jefferson Salamanders are woodland species
   ii. In 2007, the Highlands Council did a literature review on the distances vernal pool amphibians migrate from their breeding pools: The mean for Jefferson Salamanders was 827 feet (with a range of 65 to 2051).
   iii. Although it is recommended that forested habitat be maintained around vernal pools, studies have indicated that timber harvesting that maintains 50% of the forest cover is acceptable beyond 100 feet from the pools. (Note that timber harvest is not comparable to development.)
c. The Team landscape ecologist did not attempt to locate all vernal pools on the property – a task that is better done in Spring (though it is possible to find evidence of vernal pools even in the dry season).

6. Presence of invasive plants

Invasive plants, though present, are not overwhelming.

a. The following list of species observed is not comprehensive in localities, nor does it represent data from traversing over the entire property.

- Purple Loosestrife - below cleared right-of-way in north end of property
- Garlic Mustard – seen just outside the northwest corner of the electric plant fence while bushwhacking uphill from the waterline right-of-way; and in the woods south of the electric plant
- Oriental Bittersweet
- Japanese Barberry
- Multiflora Rose – in scattered locations in open areas
- Tree-of-heaven below South Mountain Road as it heads north to the electric plant
- Autumn-olive – open areas, roadsides

Recommendations

1. Find out what the Town of Berlin's plans are for the undeveloped land to the north of the NRG property, so as to determine whether it would be of value to conserve the adjacent portion of the NRG site (with the goal of contributing to preservation of an unusually large, unfragmented tract).

2. In order to be able to see more clearly the trade-offs between offering strong protection to listed species habitat and known locales vs. preserving unfragmented habitat, It is strongly recommend that field consultants be hired to determine where the listed species are to be found within the NDDB blob areas and other parts of the property.

3. In addition (or concurrently), in-depth inventories of the entire property with visits scheduled over the course of the four seasons of a year are recommended in order to map out plant communities with species lists and determine (to the extent possible) what species of wildlife use the property year-round, seasonally, and as migrants. (If this appears to be too costly, consider that it would not be thought to be out of line to recommend an engineering/soils/geology consultation prior to erecting a building.)

   Potential consultants include:

   Bill Moorhead, Consulting Field Botanist
   486 Torrington Road, Litchfield, CT 06759
   Phone & FAX: 860-567-4920; Cell phone: 860-543-1786
   Email: whmoorhead@optonline.net

4. From a recreation and visual aesthetics point of view it is reasonable to buffer the Metacomet Trail with a 250 foot buffer, ***but this should not be mistaken for the best way to promote habitat viability***.

5. It appears to this reviewer that it would be difficult to find a route to extend the South Mountain Road around the fenced electric plant if a decent habitat buffer is to be

conserved around the large woodland pool to the west. The potential for other access to the northern end of the property should be investigated.

6. Although invasive plants currently are not a huge issue, two items are suggested:
   A. If there is a concerned citizen group in the Town, next Spring would be a good time to go looking to remove Garlic Mustard before it builds up big, uncontrollable populations.
   B. Walk up South Mountain Road and mark all roadside Tree-of-heaven for removal.

7. Get up-to-date information on the planned future use of the electric plant site. If it is not going to be a power plant, strongly consider putting the proposed industrial development on the electric plant footprint and conserving the remainder of the tract.

Thinking Out of the Box

1. Note that while the site has the potential to generate income for the Town, it also has the potential to cost the Town money if further development occurs. On the one hand, development increases tax revenues and may generate new businesses. Costs of development the Town will bear include road maintenance and snow/ice removal and the increased need for fire protection and emergency services. Spatially, the demands for physical services to the site represent a greater addition than would additional development within the area already serviced by the Town.

2. Although the PoCD specifically mentions the NRG site as suitable for development, the underlying issue seems to be *how can the Town get more money*. It might be worth studying how the costs of finding spaces within the existing developed portions of the Town and renovating them for business and residences compares to developing this NRG area that is far out of reach of the Town's physical services (fire, police, ambulance, school bus) and is in a topography where the cost of construction, road maintenance and snow/ice removal is higher than average.

3. If the proposed development did not take place on the property, and the electric plant is not going to be put into operation, then consider converting the power plant to a science/nature center while keeping the rest of the site as conservation land.

Wildlife Resources

Site inspections were conducted on July 21 and August 2, 2009 to evaluate existing wildlife habitat on the property. The site has highly variable topography (elevation changes approximately 250 feet) and is comprised of a myriad of habitat types including traprock ridge outcroppings, forest, early successional water line rights-of-way, and at least two vernal pools. There are several state-listed species, including box turtle (*Terrapene carolina carolina*), Jefferson salamander complex (*Ambystoma jeffersonianum*), ribbon snake (*Thamnophis sauritus*), a sedge (*Carex squarrosa*), and Hitchcock's sedge (*Carex hitchcockiana*). There are historical reports for narrow-leaved glade fern (*Diplazium pycnocarpon*) and squirrel corn (*Dicentra canadensis*). One hundred acres are to be dedicated to open space as per the Plan of Conservation and Development (PoCD). The city has asked for recommendations regarding which 100 acres should be considered.

Existing Wildlife Habitats

The property includes a traprock ridge, forested areas to the west, north, and south of the plant, a water line right of way, and wetlands including a brook, intermittent streams and vernal pools.

Traprock Ridge

Traprock ridges are elevated landscape features made up of basalt or its relatives. Traprock ridges are included in the list of "Thirteen of Connecticut's Most Imperiled Ecosystems", compiled by Kenneth Metzler and David Wagner. According to Metzler and Wagner, "Traprock ridge distribution is limited to the Triassic/Jurassic valley in Central Connecticut (Hartford, Middlesex, New Haven counties) and the Pomperaug outlier in Litchfield/New Haven County", and, "although many of the ridge tops are in either state or non-profit conservation ownership, recreational use has had a major impact in the summits and glades. Some areas have had a substantial increase in residential development during recent years and others have had a long history of mining for coarse aggregate". Traprock ridges contain many of the habitats of conservation significance that are described in Connecticut's Comprehensive Wildlife Conservation Strategy, and support many species of Greatest Conservation Need, including black-throated green warbler (*Dendroica virens*), northern leopard frog (*Rana pipiens*), and spotted turtle (*Clemmys guttata*). Traprock ridges also support the state-listed box turtle, ribbon snake, and Jefferson salamander, all of which have documented on the site, and species such as wood frog and spotted salamander that will utilize other habitats (vernal pools) found on the property.

Forested Habitat

Forested habitat is found throughout the property. The areas north of the power plant and east of the water line right-of-way are composed of mixed deciduous and coniferous forest, with Sodom Brook running through a portion of this area. The understory is sparse, and is relatively free of invasive species such as Japanese barberry and the terrain is steep. The areas north of the power plant and west of the water line right-of-way are composed mostly of mature deciduous forest, dominated by red maple and black birch. The understory is sparse, and there are some wet areas found here. The area south of the plant is also forested, with many wet pockets and seeps. There is a higher concentration of invasive species, including multiflora rose and bittersweet. This area also contains actively utilized roadways that connect to the plant.

Forested areas are valuable to wildlife, providing cover, food, nesting and roosting places and denning sites. Hard and soft mast provides excellent forage for a wide variety of mammals and birds including white-tailed deer, gray squirrel, southern flying squirrel, eastern chipmunk, white-footed mouse, eastern wild turkey and blue jay. Trees, both living and dead, also serve as a home for a variety of insects, which, in turn, are eaten by many species of birds, including woodpeckers, warblers and nuthatches. Wooded swampy areas are utilized by species such as ribbon snake, which has been documented on the site through the CT DEP Natural Diversity Database.

Water Line Right-of-Way (ROW)

A water line right-of-way runs approximately north-south for about one mile, bisecting the forested area north of the power plant. It is approximately 50 meters wide, a sufficient distance to provide a managed, early successional habitat that functions as an old field, and is relatively free of invasive species, although tree-of-heaven and autumn olive are present. Old fields are characterized by woody plants with scattered open patches of grasses and forbs. The presence of these habitats in conjunction with forested areas provide for a diverse mix of species and habitats on the landscape. Old field habitat is valuable to a large number of species, including birds such as Eastern bluebird and American goldfinch, herbivores such as meadow jumping mouse, cottontail rabbit, and woodchuck, and reptiles such as garter snake and the state-listed box turtle, which has been documented on the site through the CT DEP Natural Diversity Database. Old field habitats consisting of woody shrubs and herbaceous plants provide nesting sites, cover, and foraging opportunities for many species, including many invertebrates, which, in turn, are preyed upon by insect-eating birds and small mammals, which are then preyed upon by raptors and larger mammals such as red fox and coyote.

Wetlands

Wetlands include Sodom Brook, several intermittent streams, at least two vernal pools, marshy areas near the northeastern boundary, and multiple wet pockets and seeps in the forested area south of the plant.

Riparian zone habitat, the area along the edge of rivers and streams, is important in protecting and enhancing aquatic habitat, as well as providing travel corridors for species such as white tailed deer, and providing habitat for species such as water shrews, some amphibians and many invertebrates.

Vernal pools are small, temporary bodies of standing fresh water that are typically filled in spring and dry out most years. There is no inlet or outlet, and therefore fish are not found in these pools. Vernal pools are important to the survival of many species of reptiles and amphibians that utilize wetlands for reproduction. For some species, such as the wood frog and the spotted salamander, vernal pools are critical, as it is the type of habitat in which they breed most successfully. These species are also dependent on the presence of healthy forested uplands surrounding the vernal pool, because, when not breeding, this is where they spend the balance of their life cycle. This habitat is also valuable to the state-listed Jefferson salamander complex, which has been documented on the site through the CT DEP Natural Diversity Database. Calhoun and Klemens (2002) recommend that the upland areas around breeding pools up to a distance of 750 feet be considered critical upland habitat, that at least 75% of that zone be kept undisturbed and that a partially closed-canopy stand be maintained.

Habitat Management Recommendations

The South Mountain Road/former NRG Site is a large, mostly undeveloped parcel, providing valuable wildlife habitat in a highly developed urban area. Undeveloped parcels over 100 acres are increasingly rare, particularly parcels with a mosaic of habitats including forested areas, early successional areas and wetlands.

The city has requested input on deciding the location of one hundred acres to be dedicated to open space. The most valuable portions of the property for wildlife includes the areas west and southwest of the power plant (encompassing the vernal pools), and the entire area north of the power plant, encompassing the water line right-of-way and Sodom Brook (see following map in for general guidance).

Large, contiguous tracts of forest such as the areas to the west, southwest and north of the power plant are increasingly rare in Connecticut, as development continues to fragment existing forests. Unfragmented tracts of this size are also rare for urban areas like Meriden and are even more valuable for wildlife when they contain multiple habitat types, such as vernal pools and traprock ridge.

Early successional habitats such as the old field type found in the water line right-of-way are also rapidly declining in Connecticut. This decline is due to development and natural succession, where farmland abandoned years ago has grown up into forestland. Interruptions of natural processes that create early successional habitats across the landscape, such as fire and flooding have also contributed to this decline. Because this is a water line right-of-way, it will continue to be managed as early successional habitat, rather than being allowed to grow up into mature forest. Having this permanent early successional habitat abutting other habitat types such as forest will provide better habitat for a greater number of species than if the surrounding areas were developed. In addition to the habitats found in this parcel, large tracts of undeveloped habitat exist to the north in Berlin. Protecting large areas such as these will provide habitat for those species that require larger tracts, as well as those that use multiple habitat types.

Summary

The South Mountain Road area has the potential to provide high-value habitat for wildlife due to both the large acreage of undeveloped habitat and the variety of habitats types of which it is comprised. Large parcels of undeveloped land containing multiple habitat types are increasingly rare in Connecticut, as development creates small, isolated patches of habitat in the landscape. For wildlife, large blocks of habitat are always better, as they can provide a greater variety of food (different types of acorns, catkins, a variety of fruits, etc.), more nesting and roosting sites, and areas for cover, and support those species with large territory requirements as well as more pairs of species with smaller territory requirements. To gain the most benefit for wildlife, both the northern portion of the site and the area west of the power plant (containing vernal pools) should be dedicated to open space. Continued stewardship of this area will conserve the inherent wildlife values and maintaining it as wildlife habitat will provide for many species with declining populations.

References

Calhoun, A. J. K. and M.W. Klemens. 2002. Best Development Practices: Conserving Pool Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States. MCA Technical Paper No. 5, WCS, Bronx NY, 57 pp.

The Northeast Upland Habitat Technical Committee and the Massachusetts Division of Fisheries & Wildlife, 2006. Managing Grasslands, Shrublands, and Young Forest Habitats for Wildlife: A Guide for the Northeast. 148 pp.

Metzler, K.J. and D.L.Wagner. Thirteen of Connecticut's most imperiled ecosystems. Draft: 16 April 1998.

South Mountain Road Area
Meriden

Map prepared October, 2009 by Robin Blum.
For informational purposes only,
contains no authoritative data.

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S

1,300 650 0 1,300 2,600 3,900 5,200

Feet

Recreation Planner Review

This reviewer’s comments focus on two aspects of Meriden's NRG site: (1) A general critique of the city's concept plan for the property and (2) The relationship of the NRG property to the New England National Scenic Trail located along the traprock ridges of central Connecticut.

In this reviewer’s opinion, the concept plan involves a conflict between municipal and state goals. On the one hand, Meriden as a post-industrial city has clear needs for increased tax base, as do many other municipalities whether urban, suburban, or rural in character. The NRG property obviously represents a major opportunity for providing such tax base, particularly offering a large acreage not requiring assemblage.

On the other hand, various regional and state plans including the State Plan of Conservation and Development have recognized the scenic and landscape-shaping significance of Connecticut's traprock ridges and the desirability of preserving them. Indeed this reviewer recalls writing similar recommendations in “The Green Land”, CT Interregional Planning Program as far back as 1966.

In attempting to resolve these opposing goals, several observations can be made. First of all, the traprock ridge occupying the NRG site already has been heavily impacted by roads, the NRG plant proper, and the nearby storage area. Thus it is in no way a prime candidate for preservation in contrast to Berlin's share of NRG land. Secondly, the concept plan proposes a million square feet of development which could be considered overkill within a traprock ridge area. Thirdly, the proposed open space within the concept plan basically consists of a fringe around the property's perimeter as well as some desirable ridgeline protection areas. However, opportunity for designating a sizeable block of open space has been overlooked.

When these three observations are blended, one can conclude that some development in this already impacted ridge is acceptable. Nevertheless the intensity and location of proposed development is questionable. The recommendation of this reviewer is to concentrate development south and southwest of the NRG plant, with any additional development deemed fiscally necessary or feasible to be east of the roughly north-south running easement, in the northeastern quadrant of the property (see maps in Introduction). This would permit dedication of a large open space area in the less physically-altered northwestern quadrant adjoining similar open space in Berlin, plus an open space corridor along the western fringe of the development area for the New England National Scenic Trail discussed below.

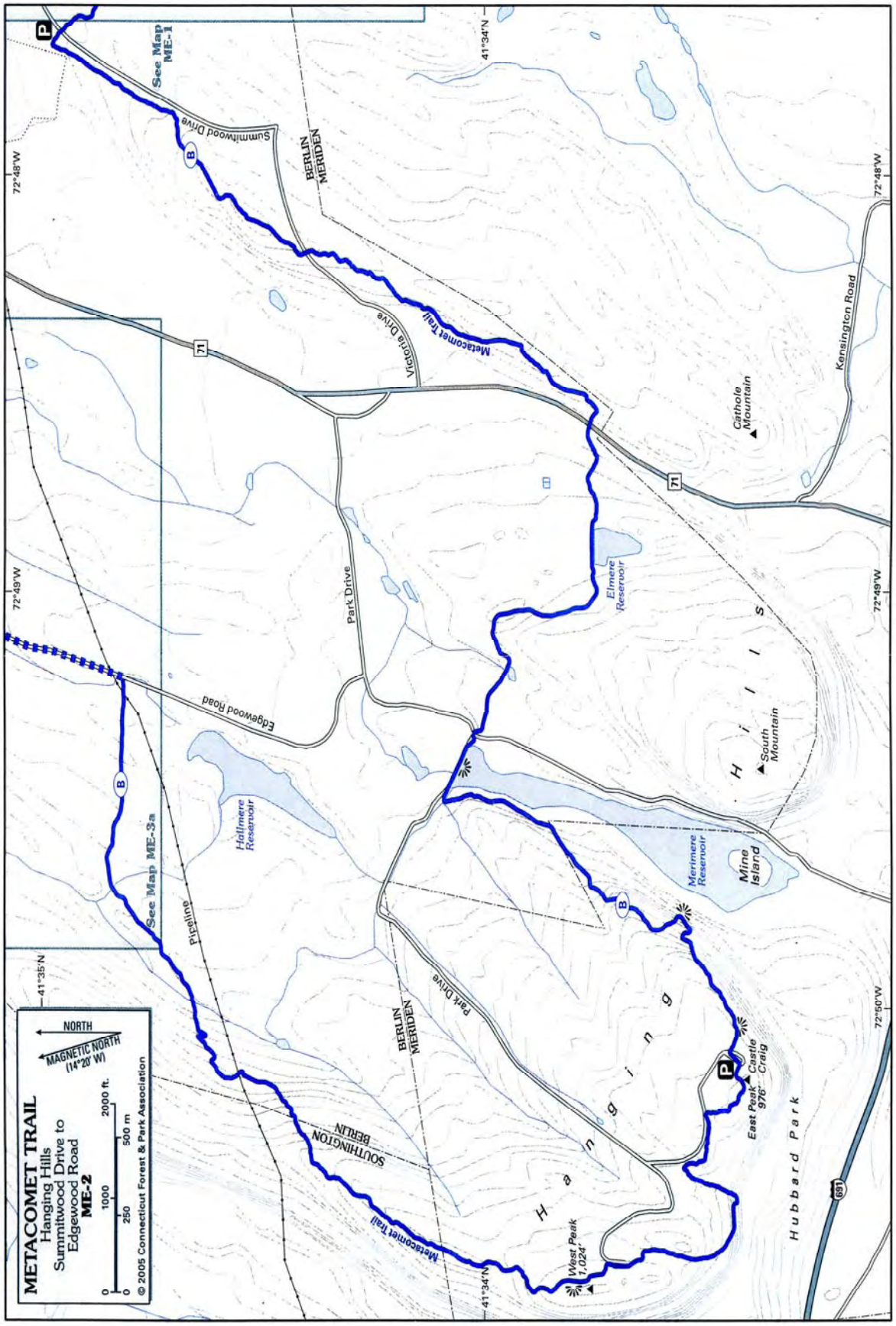
As a planner with nearly 50 years experience, this reviewer cannot resist a comment on development priorities for Meriden. For example, the large acreage of flat, developable land along State Street across from the railroad station clearly should be the short term priority for tax base enhancement. Especially with existing water and sewer facilities and discussion of concentrated development adjacent to railroad stations as part of proposed commuter service on the Springfield-New Haven Line, Meriden has the opportunity to develop a new city center and focal point. In contrast, development on the NRG site including provision of

utilities will be physically more difficult and financially more expensive. Thus it would seem to merit a lower, more long range priority.

The second half of this reviewer's comments concern the possible impact of NRG property development on the newly-designated New England National Scenic Trail which includes the historic Metacomet Trail which runs along the various traprock ridges in the Meriden area and are popularly known as the Hanging Hills. The Metacomet Trail's present location on this ridge has varied in adapting to development proposals such as Carabetta's "City on the Mountain" and the NRG power plant project. Furthermore, development in Berlin adjoining the NRG property has resulted in the trail running through a subdivision (see attached Metacomet Trail Map). Thus trail relocation in Berlin is necessary as discussed with Jim Mahoney, Berlin's Development Director. This would mean a rerouting east of Summitwood Road toward the Meriden-Berlin line, on Berlin's share of the NRG property. Because much of the current trail in Berlin south of Victoria Drive to Route 71 lies on privately-owned property including N/F Meadow Haven Inc., this reviewer suggests a relocation easterly onto Meriden's NRG land. This routing could head southwesterly, west of the easement corridor, in the area which this reviewer recommends as open space.

Although beyond the scope of this ERT review, the trail crossing of Route 71 also should be considered here. Concurrently trail relocation west of Route 71 is being discussed with Meriden's Water Department., to move the trail away from a water tank and treatment plant at Elmere Reservoir. To ensure that an appropriate crossing of Route 71 is selected which will avoid dangerous road walking, joint planning by interested parties is recommended, including City of Meriden, Town of Berlin and the Connecticut Forest and Park Association (CFPA).

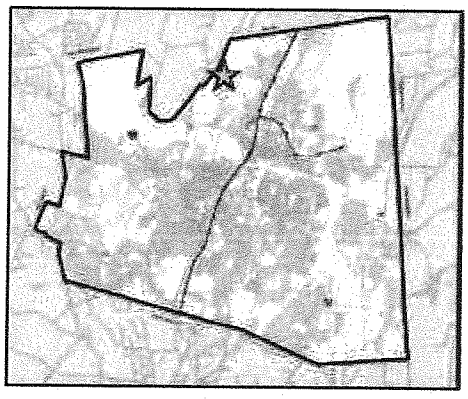
A final trail-related comment involves the proposed trail linkage of the Boys and Girls Club to the New England National Scenic Trail. Because of the obstacle presented by a wetland corridor, a routing northerly of the wetland onto Berlin's NRG open space seems necessary and will also involve joint planning.


METACOMET TRAIL
Hanging Hills
Summitwood Drive to
Edgewood Road
ME-2
NORTH
MAGNETIC NORTH
(14°20' W)
2000 ft.
1000
500 m
250
0
0
© 2005 Connecticut Forest & Park Association
See Map ME-1
See Map ME-3a
Summitwood Drive
Metacomet Trail
Victoria Drive
Park Drive
Edgewood Road
Pipeline
Kensington Road
Cathole Mountain
Elmere Reservoir
Hallmere Reservoir
Merimere Reservoir
Mine Island
South Mountain
West Peak 1,024'
East Peak 976'
Castle Craig
Hubbard Park
BERLIN
MERIDEN
SOUTHINGTON
BERLIN
72°48'W
72°49'W
72°50'W
41°34'N
41°35'N
691
71
B
P

Appendix

NRG Site

Site Description



Locational Map of NRG Site

Located along the north central edge of the City, the former NRG property comprises roughly 310 acres of land. The site is bound to the north by Berlin, to the west by Chamberlain Highway (Route 71), Sams Road and Kensington Avenue to the south, and City-owned open space and residential neighborhoods to the east. The former plant itself and its accompanying 22.6 acres are still under the control of the generation company. An easement for piping in cooling water from the Connecticut River exists from the plant boundary northward to Berlin bisecting the site. Two vehicular access points to the site exist, one off of the Chamberlain Highway and the other at the end of Sams Road. Topography of the site is highly variable, with the greatest relief along the southern section of the site. The difference in elevation is 250 feet between the lowest point near Hicks Avenue and the highest point at the southwestern peak overlooking Route 71. Due to the topography and overall size of the site the land uses surrounding the site are extensive. To the south of the site is the Westfield Meriden Shoppingtown mall, to the west is a low density residential and undeveloped areas of Berlin, to the east are medium density residential neighborhoods and city owned open space.

Site Characteristics

Size: 310.9 Acres City Owned
22.6 Acres For Generation Plant
Zoning: Planned Development District (PDD)
Wetlands: 7.8 Acres
Steep Slopes > 25%: 135.3 Acres
Part of site contains CT DEP Natural Diversity Database Listed Species (NDDB)
Ridgeline Protection Areas along southern boundary
Vernal Pool Conservation Area: Approx. 3 Acres
Utilities: Electric, Sewer, Gas, & Water

Assessment Information

Ownership: City Ownership
Market Value (per assessor record): $2,271,700
Assessed Value (October 2007): $1,590,190
Tax Yield (October 2007): $44,461

Traffic Volumes:

RTE 71 (Chamberlain Highway) North of Lewis Ave: 5,900 ADT

Development Potential

- 936,000 SF of Flex Space & Office
    - Market Value Potential: $80,444,000
    - Assessed Value Potential: $56,310,800 real property; $5,626,660 personal property
    - Tax Yield Potential at 27.96 mills: $1,731,771
    - Potential Jobs Created: 1,240 jobs
- 3,520 Parking Spaces
- 30-40 Units of Age Restricted Housing
    - Market Value Potential: 30-40 Age Restricted dwellings at $275,000 = $8,250,000 to $11,000,000
    - Assessed Value Potential: $5,775,000 to $7,700,000 real property; $225,000 to $300,000 personal property
    - Tax Yield Potential at 27.96 mills: $168,000 to $224,000
- 12 Single Family Homes
    - Market Value Potential: 12 Single Family dwellings at $450,000 = $5,400,000
    - Assessed Value Potential: $3,780,000 real property; $168,000 personal property
    - Tax Yield Potential at 27.96 mills: $110,400
- Potential Open Space: Approx: 150 Acres

TOTAL PROPERTY TAX REVENUE: Approximately $2.01 million to $2.07 million

TOTAL JOBS CREATED: 1,400 jobs

ASSUMPTIONS

Light Industrial

- Construction cost per SF = $80.00
- Business Property: 10% of real property assessed value
- Employees: 1,030 SF per employee

Office

- Construction cost per SF = $120.00

- Business Property: 10% of real property assessed value
- Employees: 300 SF per employee

Single Family Residential

- Average Sales Price per Unit = $450,000
- Personal Property: 2 vehicles per unit; assessed value of $7,000 per vehicle

Age-Restricted Residential

- Average Sales Price per Unit = $275,000
- Personal Property: 1.5 vehicles per unit; assessed value of $5,000 per vehicle
- Stable mill rate and assessment equalization rate of 70%

City of Meriden, Connecticut

Plan of Conservation and Development

City of Meriden
Planning Commission

March 2009

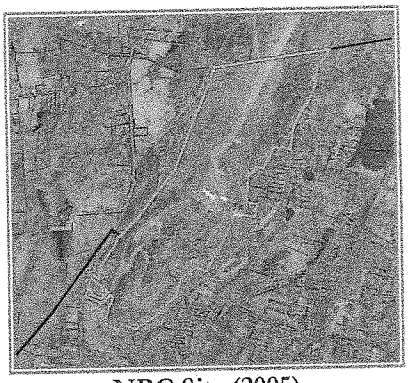
Economic Development Opportunities in Meriden

In addition to the economic development initiatives already in the process of being studied, designed or implemented and discussed above, Meriden has several properties/locations where additional substantial economic development could be realized. These sites and their future use are important to the City from an economic development standpoint since Meriden has few relatively large sites remaining for tax base development.

To ensure the long-term economic health of Meriden, the City must explore areas within its borders for increasing economic development and expanding the tax base. To this end, the City's Planning Commission authorized HMA to study the economic development potential of several selected sites across the City as part of the POCD update process.

Development potential was assessed for these sites, as well as determination of the preferred long-term general land use for each site. The findings of these special studies are described below.

The Former NRG Site



NRG Site (2005)

Located along the north central edge of the City, the former NRG property comprises roughly 310 acres of land. The site is bound to the north by Berlin, to the west by Chamberlain Highway (Route 71), Sams Road and Kensington Avenue to the south, and City-owned open space and residential neighborhoods to the east. The NRG plant building and its accompanying 22.6 acres remain under the control of the generation company. An easement for piping in cooling water from the Connecticut River exists from the plant boundary northward to Berlin bisecting the site. Two vehicular access points to the site exist, one off of the Chamberlain Highway and the other at the end of Sams Road. Topography of the site is highly variable, with the greatest relief along the southern section of the site. The difference in elevation is 250 feet between the lowest point near Hicks Avenue and the highest point at the southwestern peak overlooking Route 71. Due to the topography and overall size of the site the land uses surrounding the site are extensive. To the south of the site is the Westfield Meriden Shoppingtown mall, to the west is a low density residential and undeveloped areas of Berlin, to the east are medium density residential neighborhoods and city owned open space.

Summary of Harrall-Michalowski Study.

Site Characteristics

Actually 289 acres City owned, plus a road

Size: 310.9 Acres City Owned
22.6 Acres For Generation Plant
Zoning: Planned Development District (PDD)
Wetlands: 7.8 Acres
Steep Slopes > 25%: 135.3 Acres
Part of site contains CT DEP Natural Diversity Database Listed Species (NDDB)
Ridgeline Protection Areas along southern boundary
Vernal Pool Conservation Area: Approx. 3 Acres
Utilities: Electric, Sewer, Gas, & Water

Preferred Long-Term Land Use: Individual Pods of Light Industrial, Office, Large-Lot Residential and Age-Restricted Residential, combined with substantial areas of open space retention.

encompass properties along Camp Street, Webb Street and Milk Street. At present, this area has a wide variety of land uses, including single family and multifamily residential, retail businesses, private institution uses, and educational uses. This area is currently zoned NCDD "Neighborhood Commercial Design District", C-2 "General Commercial" and R-1 "Single Family Residential".

South Mountain Road Area: Light Industrial / Office / Residential / Open Space

This special use designation envisions a mixture of uses that will generate economic benefits for the City of Meriden along with residential development of an appropriate scale in a development pattern that maximizes the retention of undisturbed open space and protects natural resources. The former NRG site, with the exception of the electric generation plant parcel itself, is the area of Meriden designated for this type of mixed use. City ownership of most of the land, and the size and topography of the area, make this particular area of Meriden unique.

From the 289 acres of City owned land:

- **There shall be a minimum of 144.5 acres (50%) of natural legally protected open space to remain in City ownership.**

  - To ensure that high natural values of the site are conserved, approximately two thirds of total natural undisturbed lands (about 100 acres) should be dedicated as open space prior to lease, sale or further development of any part of the site.

    - The areas that should be dedicated are generally exterior areas to include ridgeline/ridgeline setback areas, forested boundary areas with high visibility, and habitat and trail corridors; also to include riparian wetland and floodplain corridor areas that extend to the interior.
    - Such land will remain undisturbed except for trails or limited road crossings/infrastructure, if necessary, in pre-identified locations.
    - An open space map is to be prepared delineating specific areas to be deed protected for approval by the City Council.

  - The remainder of the projected protected open space (approximately 45 acres) would be determined and dedicated, in part or in whole, after a substantial amount of land is leased or sold or when approved to be developed.

    - Generally, large interior locations such as steep sloped areas that can be added to enhance contiguous dedicated open space or to create a limited number of substantial additional protected areas.
    - Not to include portions within or directly adjacent to development such as landscaped areas, areas with utility easements, thin strips or smaller isolated undeveloped pieces.

Goal of Project

- To ensure that the projected grand total of dedicated high quality open space is met, the total acreage leased or sold for development cannot exceed the total acreage dedicated as open space, nor can any land disturbance be approved that would negate the intent of conserving natural open space as identified herein.

- To ensure that high natural values of the site are comprehensively conserved, the following guidelines for protected open space are provided:

  - Generally, exterior site areas with substantial corridors (at least 250 feet in width) that will promote habitat viability.
  - Habitat and trail corridors along the northern and western boundaries of the site.
  - Riparian corridors and an enlarged area north/south/west of the vernal pool.
  - A northern corridor open space would allow for trail linkage to open spaces located adjacently in Berlin, and to the Boys Club and the western portion of the City owned former Westvaco site.
  - A western corridor open space would maintain natural linkage to the regional "blue" Metacomet trail and link to the other described projected open spaces on the site.
  - Generally, areas on the south side of South Mountain Road.

- **Approximately 144.5 acres (50%) of land should be part of developed taxpaying projects.**

  - Any development will be strictly regulated per design standards to be adopted by the City Council. These standards are to ensure preservation of the natural environment, and to ensure compatibility and minimize visual impacts.

    - Such standards will include restrictions on height and the requirement of locating structures in areas that due to elevation, ground cover, fauna are not visible off site. If visibility of any proposed development is ever an issue, techniques such as visual simulation or other modeling of a proposed building could be utilized.

  - Generally, development areas will be located within the interior of the site. Areas on the north side of South Mountain Road and within the center of the site are envisioned for industrial/office flex building space, and residential development is envisioned for the northeastern development part of the site.

    - The use and density of the entire development area, any new lot or Master Plan subarea, would be City Council approved.
    - While encouraging private investment and responsibility, due to present ownership, the City has an opportunity to retain some control to ensure only future beneficial, taxable land uses.

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 and 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 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 in the review of sites proposed for major land use activities or natural resource inventories for critical areas. 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 recreation/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 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 landowner / developer allowing the Team to enter the property for the purposes of a review and a statement identifying the specific areas of concern the Team members should investigate. When this request is reviewed by the local Conservation District and approved by the King's Mark RC&D Executive Council, the Team will undertake the review. At present, the ERT can undertake approximately two reviews per month depending on scheduling and Team member availability.

For additional information regarding the Environmental Review Team, please contact the King's Mark ERT Coordinator, Connecticut Environmental Review Team,Connecticutert@aol.com, P.O. Box 70, Haddam, CT 06438. The telephone number is 860-345-3977. www.ctert.org