The Village at Scantic
Enfield, Connecticut

Eastern Connecticut
Environmental Review Team Report

Eastern Connecticut
Resource Conservation & Development Area, Inc.

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Enfield, Connecticut

Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team
Of the
Eastern Connecticut
Resource Conservation and Development Area, Inc.

For the

Inland Wetland and Watercourses Commission and the Conservation Commission
Enfield, Connecticut

Report #623

January 2009

Acknowledgments

This report is an outgrowth of a request from the Enfield Inland Wetlands and Watercourses Agency and the Enfield Conservation Commission to the North Central Conservation District (NCCD) and the Eastern Connecticut Resource Conservation and Development Area (RC&D) Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

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

The field review took place on Wednesday, December 10, 2008.

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David Poirier	Staff Archaeologist State Historic Preservation Office (860) 566-3005, Ext. 319
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Joanna Winkler	Natural Resource Specialist North Central CT Conservation District (860) 875-3381

**Report not yet received.*

I would also like to thank Katie Bednaz, inland wetland agent and assistant planner, Roger Alsbaugh, assistant town planner, Dave Frederick and Patrick Tallarita, Villages LLC, agents for the developers and Todd Clark, Aeschliman Land Surveying, PC, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with location and aerial photos. During the field reviews Team members received plans (dated 9/30/08), and additional information. Following the reviews, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the town and developer. 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 town. The results of this Team action are oriented toward the development of better environmental quality and the long term economics of land use.

The Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in reviewing this proposed residential subdivision.

If you require additional information please contact:

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Introduction

Introduction

The Enfield Inland Wetlands and Watercourses Commission and the Enfield Conservation Commission have requested Environmental Review Team (ERT) assistance in reviewing plans for a proposed residential open space subdivision.

The project site is located on the east side of Simon Road immediately north of the East Windsor town line. The 38 lot single family subdivision is on 64.4 acres. There is Town of Enfield land to the north and State of Connecticut land to the east. The project site abuts a wetland on the north side, which consist of a small watercourse which is partly seasonal. The easterly portion of the site abuts the flood plain of the Scantic River. The site will be served by sanitary sewers and public water supply. The proposed building lots have a minimum lot size of 30,000 sf. The entrance road from Simon Road will be a boulevard leading to a circular return and one cul-de-sac. Three detention ponds are proposed. There will be approximately 20.8 acres of open space.

Objectives of the ERT Study

The Town is requesting ERT assistance to complement existing information and provide a more comprehensive inventory and analysis of the existing natural resources on site. The town is seeking information necessary to design a project with low impact and one that will protect the natural resources on site and surrounding areas. Areas of concern for the commissions centered on the Scantic River, escarpment soils and slopes, erosion and sediment control, stormwater management, and potential wetland and watercourse impacts

The ERT Process

Through the efforts of the Enfield Inland Wetlands and Watercourses Commission and the Enfield Conservation Commission this environmental review and report was prepared for the Town of Enfield.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the town. Team members were able to review maps, plans (dated 9-30-08) and supporting documentation provided by the applicant.

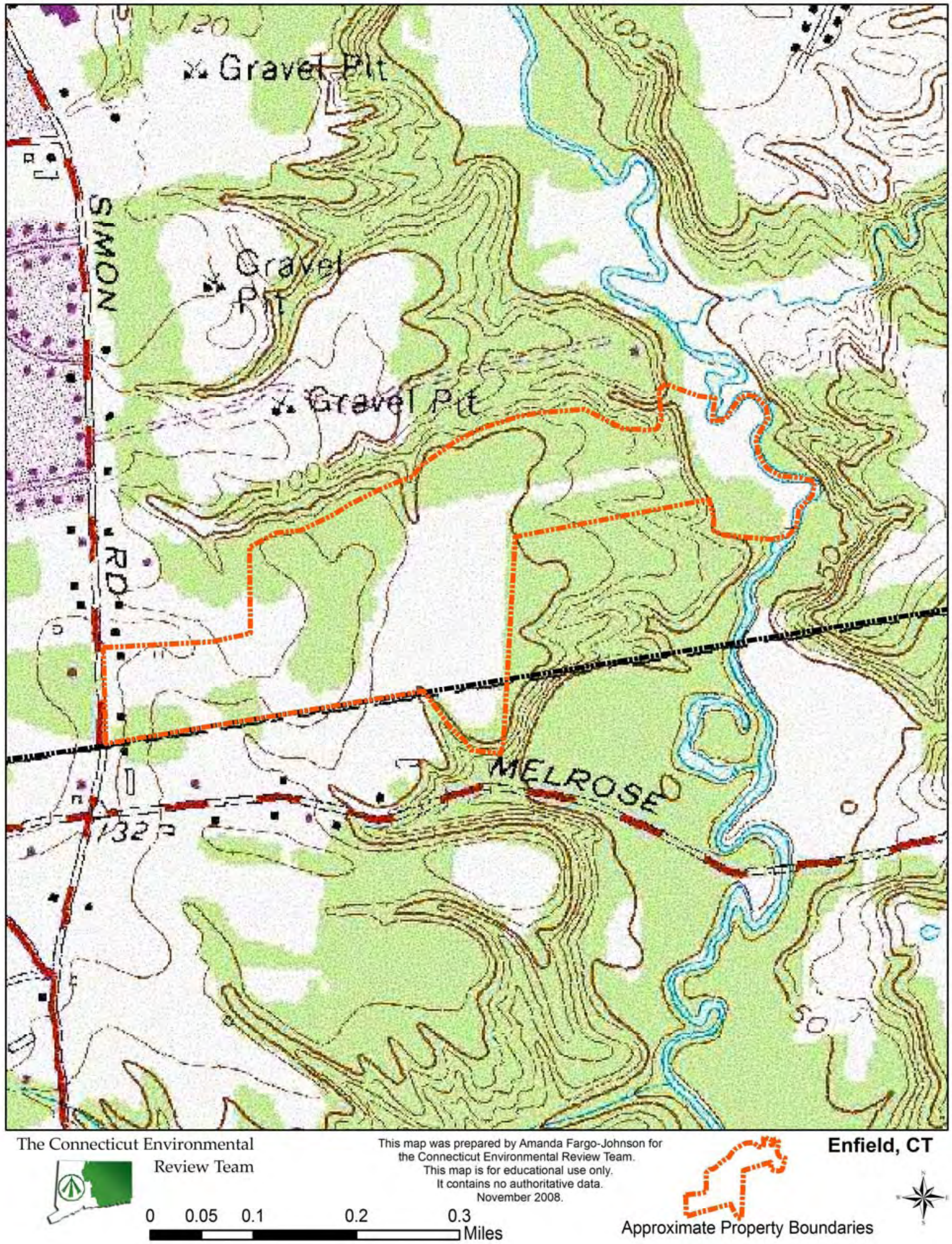
The review process consisted of four phases:

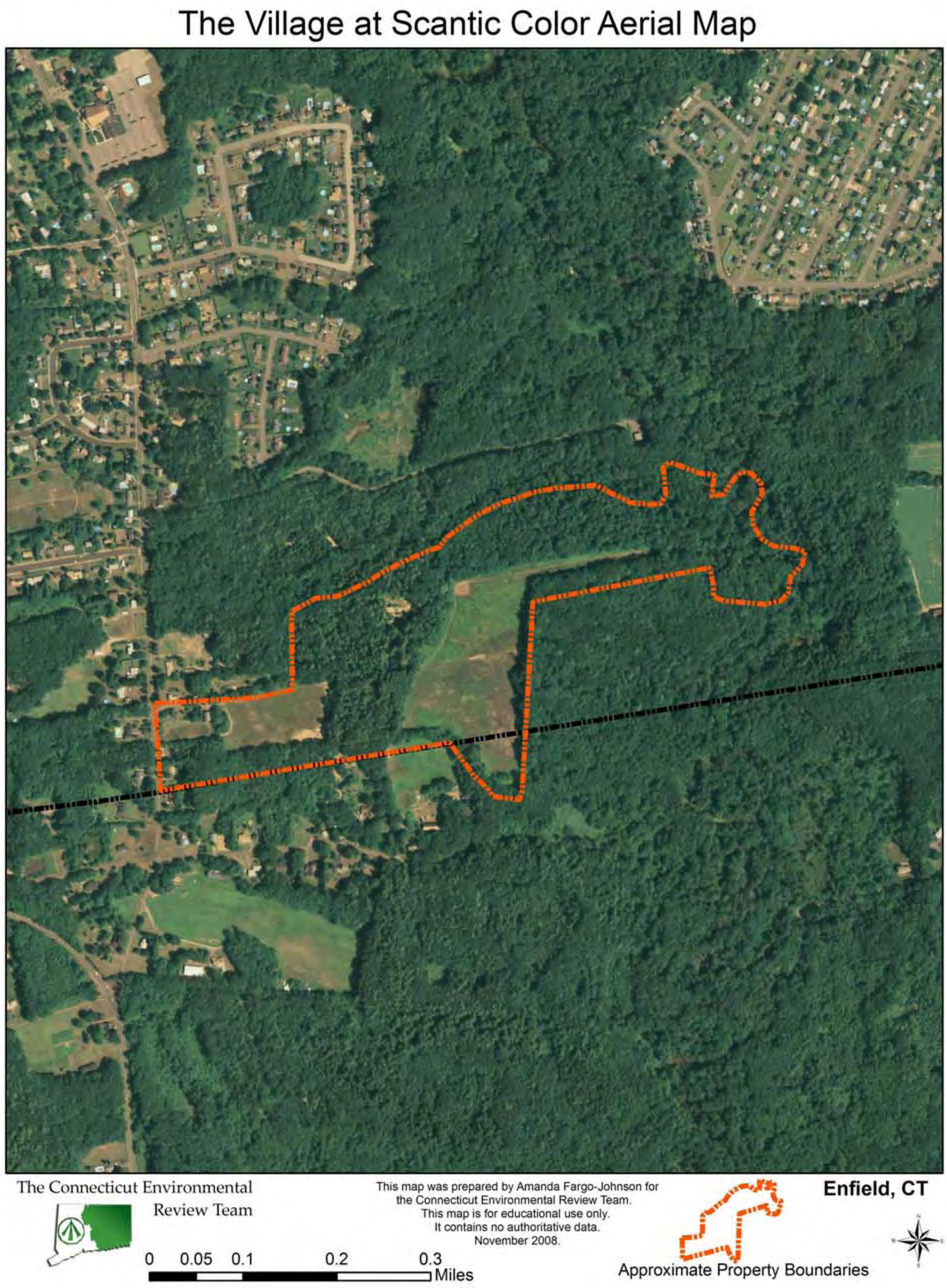
1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

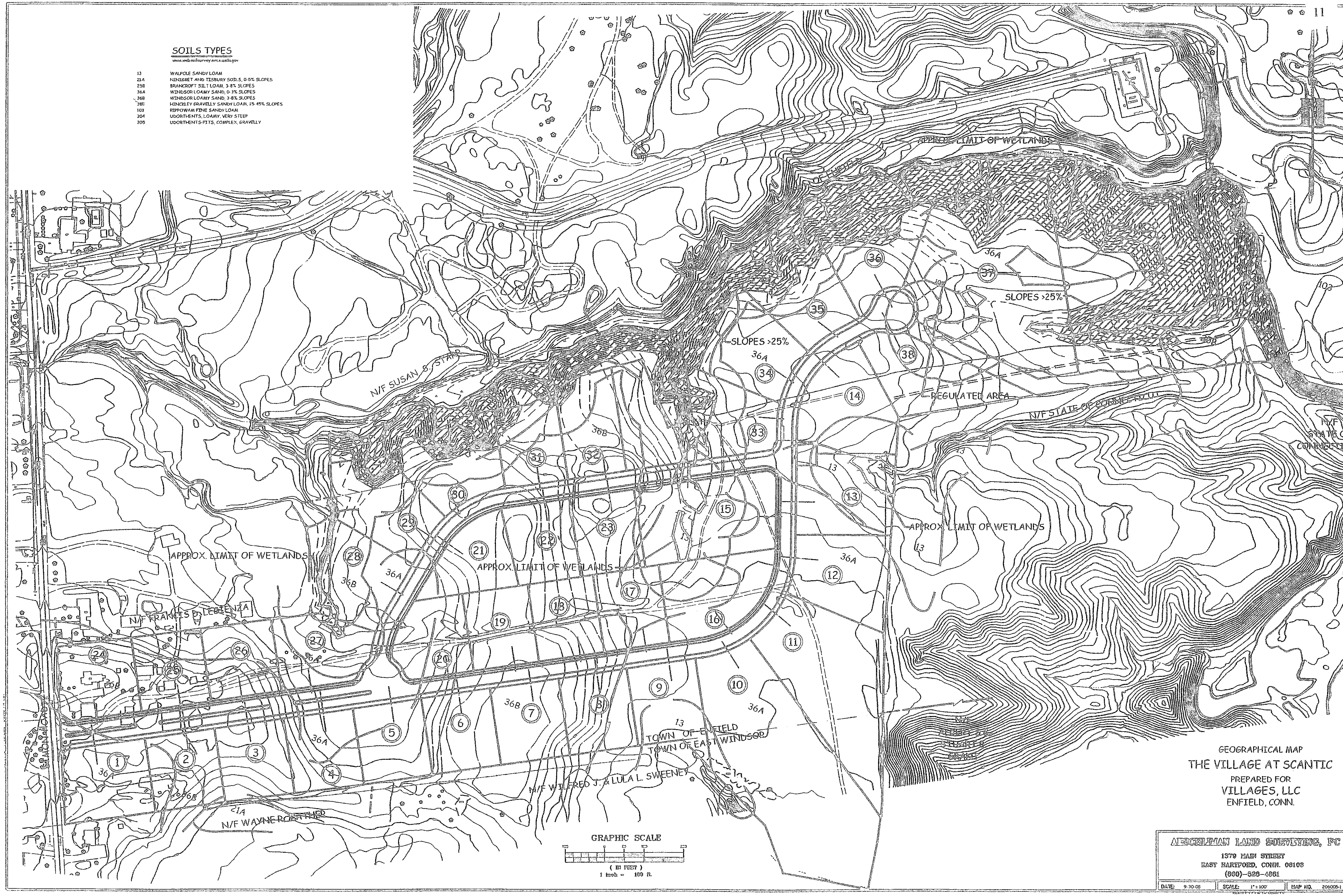
The data collection phase involved both literature and field research. The field review was conducted Wednesday, December 10, 2008. Some Team members made separate and/or additional site visits. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

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

The Village at Scantic Site Map




The Village at Scantic Color Aerial Map
The Connecticut Environmental Review Team
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.
November 2008.
0 0.05 0.1 0.2 0.3 Miles
Enfield, CT
Approximate Property Boundaries


SOILS TYPES
www.websoilsurvey.nrcs.usda.gov
13 WALPOLE SANDY LOAM
21A NINIGRET AND TISBURY SOILS, 0-5% SLOPES
25B BRANCROFT SILT LOAM, 3-8% SLOPES
36A WINDSOR LOAMY SAND, 0-3% SLOPES
36B WINDSOR LOAMY SAND, 3-8% SLOPES
38E HINCKLEY GRAVELLY SANDY LOAM, 15-45% SLOPES
103 RIPPOWAM FINE SANDY LOAM
304 UDORTHENTS, LOAMY, VERY STEEP
305 UDORTHENTS-PITS, COMPLEX, GRAVELLY
APPROX. LIMIT OF WETLANDS
SLOPES >25%
REGULATED AREA
N/F SUSAN S. STAPP
N/F FRANCIS P. LEBIENZA
N/F WILFRED J. & LULA L. SWEENEY
N/F WAYNE ROSATHER
TOWN OF ENFIELD
TOWN OF EAST WINDSOR
GRAPHIC SCALE
(IN FEET)
1 inch = 100 ft.
GEOGRAPHICAL MAP
THE VILLAGE AT SCANTIC
PREPARED FOR
VILLAGES, LLC
ENFIELD, CONN.
AESCHLIMAN LAND SURVEYING, PC
1379 MAIN STREET
EAST HARTFORD, CONN. 06108
(860)-528-4881
DATE: 9-30-08
SCALE: 1" = 100'
MAP NO. 206005-1

Topography and Geology

The exposed geologic materials in the southern part of Enfield are unconsolidated sediments. Very fine-grained, well-sorted sand forms a surface layer. It is more than 30 feet thick in places. The sand is permeable. It is underlain by a layer of clay and mud that is not very permeable. The contact between the layers is nearly flat. The layers were formed at the end of the last Ice Age.

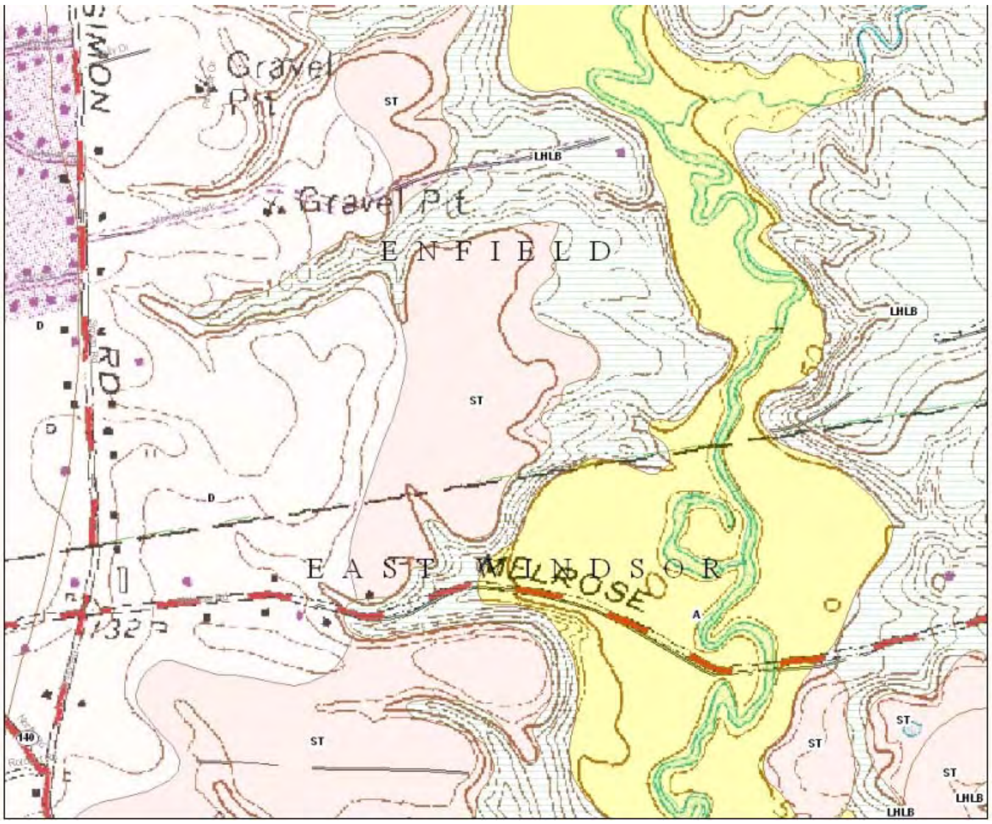


Figure 1. Quaternary geologic map showing terrace (center) on which Scantic Village is proposed. Area labeled D (pale green) is area with sand dune cover; ST (tan) is sand deposited as stream terraces; LHLB (green ruled) = Lake Hitchcock lake bottom mud, A (yellow) = modern alluvium. From Stone and others, 2005.

During the end of the last Ice Age, central Connecticut north of Rocky Hill was filled with a glacial-meltwater lake. The lake (referred to as glacial Lake Hitchcock) stretched from the trap-rock ridge in the west to beyond Ellington Village on the east, and from Rocky Hill on the south northward into Vermont and New Hampshire. Most of Enfield would have been on the lake bottom. Sedimentation processes on that lake bottom established the character of the later topography in Enfield.

Meltwater entered the lake on a seasonal basis: during the late spring, summer, and fall large scale melting occurred to what remained of the glacial ice, sending torrents of muddy meltwater into the lake basin. Sand and gravel deltas were deposited along the lake shore in some locations. During the winter, suspended sediment in the water settled to the bottom forming a layer of mud. Gradually, the lake partially filled with the settled mud and a broad flat lake bottom was formed. The lake eventually drained, exposing the broad flat lake bottom. After the lake drained, local streams washed over the exposed lake bed and deposited a widespread sand layer (fluvial) about 20 feet thick. The sand layer is sorted and permeable. Westerly winds blew very fine-grained sand (aeolian) across the stream terraces and piled up local fields of low amplitude sand dunes. The dunes consist of very fine-grained well-sorted sand. The aeolian and fluvial sand layers form an extremely permeable and well-drained soil. No water courses are found on top of the sand; rainwater and snowmelt soak in.

As the Connecticut River cut its channel down through the unconsolidated sediments, base level lowered and local streams began dissecting (eroding) the sand-dune covered lake bottom. Today's topography is a function of these geologic processes. The topography is broad and plain-like with local deposits of wind-blown sand. Rivers and streams have eroded steep-sided gullies valleys into the plain.

Topography of the site can be characterized as a broad fairly level area that is bounded by a steep drop on the north and a moderately steep drop into the Scantic River Valley to the east. The southerly and westerly boundaries of the property are not bounded by natural features. The level area in the front (west) of the parcel has an elevation about 120-130' above sea level; it drops off about a third of the way back to a terrace approximately 20 feet lower in elevation. The terrace was cut into lake-bottom sediments prior to being covered by wind-blown sand (Colton, 1965). The 20-foot topographic drop is caused by the eastern slope of a sand dune (parabolic?). It is unclear to this reviewer which stream(s) deposited the terrace sands. It could have been the ancestral Scantic River in this area. The back third of the parcel has moderate slopes down to the flood plain of the Scantic River. Glacial-lake mud layers are found at the surface in this area. Special engineering precautions may be necessary when siting a foundation on near surface mud layers (e.g. Lot 37).

The Scantic River is a meandering stream with a flood plain about 500 feet wide. It has an elevation about 40 feet near the southeast property bound. It is an entrenched river with steep escarpments that range in height from 20 to as much as 50 feet. The steep slopes of the escarpments are maintained by the stiffness of lake-bottom mud layers. In addition, the fine-grained wind-blown sand above the lake-bottom sediments maintains a steep slope.

Figure 2.Steep slope (left) at edge of Scantic River flood plain where the river eroded into lake bottom mud layers. Slope is steeper than 3:1. Right image shows slope maintained by stream terrace and wind-blown sand layers.

The wind-blown sand is well sorted and as such is permeable to the flow of water. Rain-fall and snow-melt readily soak into the sand. No watercourses were noted on the wind-blown sand deposits. The water that soaks in, pulled by gravity, percolates downward until it encounters the lake bottom mud layers which act as a permeability barrier. Perched ground-water develops that flows laterally toward the Scantic River or any of the small gullies that feed into the Scantic. This pattern supports numerous springs during the wet seasons at the head of each gully.

Figure 3. Two springs at base escarpment slope. Groundwater issues from sand layer where it overlies mud layer. Springs likely are seasonal. Note overstep slopes at head of each gully, a product of groundwater sapping. Note also that few trees show disruption from soil creep.

There, groundwater sapping actively erodes the gully headward, thus lengthening the gully. Thus, each spring will create an oversteepened slope that is slowly eroding away. The oversteepened slopes may be expected to periodically fail creating local landslides (indeed, Colton, 1965, maps two landslide deposits in the Scantic River Valley in this quadrangle). It is

Figure 4. Although tree disruption from soil creep is minimal on the site, some areas have experienced soil creep that has disrupted trees. Down-slope processes do occur, however slowly, posing some level of risk of slope failure in the future.

a slow and inexorable process and most of the slopes appear stable (i.e. little or no evidence of downhill creep was noted such as bent tree trunks or slump scarps). Placing weight at the top of an oversteepened slope, however, could destabilize the slope, especially if the weight is close to the edge of the escarpment.

An intermittent stream flows along the northern boundary of the parcel. This stream seems at an equilibrium state where it enters the flood-plain of the Scantic River, but upstream a few hundred feet, where a sewer crossing is proposed, the stream is actively down cutting and eroding its banks. Lake bottom mud layers are being eroded by the stream. A narrow flood plain had been established prior to the latest episode of down-cutting. Now the stream has entrenched that narrow flood-plain. The extent to which down-cutting will continue could not be determined during the ERT field observation. The cause of the new episode of down-cutting may be local, related to the upstream migration of a nick-point or it may be related to development factors further upstream in the drainage basin (watershed).

Figure 5. Stream actively eroding its banks and cutting down through a temporary narrow flood plain. Note cutbank erosion that has cut into escarpment slope. Picture on left shows a meander that cut into the flood plain and then was left higher than the channel by further down-cutting (water goes under roots of tree shown on picture to right. Left picture looks downstream from proposed sewer crossing, right picture looks upstream from same location.

In his October 14, 2008 report, Dr. Clarence Welte's statement "there is clear evidence that any geologic processes are sufficiently slow as not to pose any danger to the slopes…" is misleading. Indeed the processes are slow and the risk of slope failure on any given time period is minimal, but there is some risk. There is a low probability that by undercutting at the base of the slope coupled with placing weight on top of the slope the slope could destabilize at any location. It is this reviewer's opinion that restrictions should be placed on how close to the edge of the escarpment building could take place. It must be noted that development has taken place close to the escarpments in neighboring areas. Apparently no slope stability problems have been reported to date. Perhaps those could be used as a comparison.

References

Colton, R.B., 1965, Geologic map of the Broad Brook Quadrangle, Hartford and Tolland Counties, Connecticut. U.S. Geol. Surv. Quad. Map. #GQ-434.

Stone, J.R., Schafer, J.P., London, E.H., DiGiacomo-Cohen, M.L., Lewis, R.S., and Thompson, W.B., 2005, Quaternary Geologic Map of Connecticut and Long Island Sound Basin (1:125,000). U.S. Geol. Surv. Sci. Invest. Map # 2784.

A Watershed Perspective and Low Impact Development

General Setting

The proposed subdivision is abutted on the east by floodplain of the Scantic River and on the north by an unnamed tributary.

Soils and Quaternary Geology

The site is unique because of its soil types and associated characteristics. The soils onsite consist of stratified sand on top of lacustrine varved silts and clays. These soils are characteristically referred to as terrace escarpments, which are extremely prone to catastrophic erosion. Water from precipitation and other sources typically is absorbed rapidly and percolated downward to the top of the water table. As a result a seasonally saturated layer develops in the sands above the lacustrine materials, where groundwater discharge typically occurs. Sandy soils in this horizon are most susceptible to erosion due to solifluction. Best management practices, including avoidance of all impact, and care to not increase stormwater runoff, must be required to minimize impacts to existing slopes. To the extent possible, the tree canopy should be preserved close to the edge of existing slopes. It is likely that these slopes will migrate and will due so catastrophically at some future time. It is recommended that a survey be obtained to define the tributary stream's profile, and that analysis of potential erosion rates be determined.

These soils are extremely well drained due to high permeability and infiltrative capacity in the sandy horizon, and generally poorly or somewhat poorly drained in the underlying lacustrine parent materials due to low permeability and infiltrative capacity. As a result, the topography is flat and without significant surface drainage features, except in the areas where the terrace escarpments exist surrounding the small watercourse. These soils lend themselves well to development since they are flat and sandy, although significant precautions must be taken to avoid aggravating the potential for severe erosion of the terrace escarpment areas.

Surface Water Hydrology

The site is entirely within the Scantic River drainage basin, or watershed. The Scantic River Regional basin is identified in the statewide drainage basin coding system as basin number 42 and also the Scantic River subregional basin number 4200. This is a sub-regional basin draining about 60.5 square miles, and discharges directly to the Connecticut River. Surface waters on the site include a small unnamed tributary stream which borders the site on the north and flows eastward toward the Scantic.

The State Water Quality Classifications classify surface and ground waters in the state by existing water quality conditions, a classification goal, and its designated uses stated in the State of Connecticut Water Quality Standards and Criteria. The Standards and Classifications are designated to manage water quality to protect health, the environment, and legitimate uses of water resources. The complete State of Connecticut Water Quality Standards and Criteria

document is available on the CT DEP web site at:
http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325618&depNav_GID=1654

The Scantic River is classified "B" surface water quality. Class B waters overall have excellent water quality and are designated for use as fishable/swimmable (suitable for recreational use, fish and wildlife habitat), as well as agricultural and industrial water supply. The Scantic River is managed for cold water fisheries and stocked with trout.

The existing B quality condition indicates it may not be meeting the water quality criteria for one or more designated uses. Review of the state Leachate and Wastewater Discharge Sources Inventory (1998) that supports the Water Quality Classifications, indicates that upstream of the development proposal within the Scantic watershed, there are several potential leachate sources including a landfill (Enfield) and discharge of treated wastewater effluent (Somers) as well as several contaminated wells. There is an aquatic life use support impairment in the Scantic below its confluence with Broad Brook.

Groundwater/Aquifer Resources

The State Water Quality Classifications, indicate groundwaters on the site are classified "GA". Class GA groundwaters have designated uses as existing private and potential public or private drinking water supplies, and as baseflow to adjacent surface water bodies. Water quality is generally good and at a minimal should be suitable for drinking or other domestic use without treatment. Domestic sewage discharges can be considered consistent with this standard. This development, like all surrounding developed land is served by municipal water and sewer service. Wastewater discharges to the ground in GA areas are limited to approved treated domestic sewage.

Water Quality Assessment

The 2008 Integrated Water Quality Report to Congress indicates the Scantic River segment CT4200-00_02 associated with this subdivision development proposal is in Full Support for Fish Consumption; no other designated uses have been recently assessed. Water quality in the unnamed tributary has not been assessed.

Potential Water Quality Issues

Sediment is a pollutant of concern for the Scantic River. Excessive sedimentation can result from highly erodible soil types that are present at this site. In addition, the underlying lacustrine soil parent materials can lead to high turbidity when suspended, which can adversely affect fisheries through degradation of stream bottom habitat. Problems can result for sensitive fish and invertebrates which serve as food sources for other organisms, especially in reproductive stages. That can lead to adverse impacts to downstream fisheries.

Nitrogen and phosphorus are the nutrients of concern to water quality. Both can be found in high concentrations in runoff. Disturbed soils that are particularly susceptible to erosion should be protected to the maximum extent possible. The clay and silt materials in the lower soil horizons can contribute significant turbidity and phosphorus   Nutrients are associated with runoff from agricultural lands, urban runoff from lawns and pet wastes, leachate from landfills and septic systems, and erosion. These pollution sources all exist within the Scantic River Brook sub-watershed. Unchecked nutrient pollutant management can lead to downstream impacts.

Stream water temperature changes stress cold water fisheries during critical summer months as well as other aquatic organisms. The Scantic River is generally surrounded by adequate floodplain forest, which supports a near continuous foliage canopy that limits warming by sunlight. Maintaining or enhancing natural(ized) streambank vegetation will shade the water, limiting temperature changes and supporting high dissolved-oxygen levels. 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.

Water Supply Wells

There are no identified public water supply wells nearby to this subdivision proposal.

Stream Channel Encroachment Lines (SCEL)

There are no Stream Channel Encroachment Lines on the Scantic River at this location.

Aquifer Protection Areas (APAs)

This parcel is not located within an approved Aquifer Protection Area (APA).

Proposed Land Use

The proposed development will utilize sewers for wastewater disposal and should maximize infiltration of runoff from impervious surfaces. Outfalls from detention basins must be stabilized so that peak runoff during major storm events does not cause catastrophic erosion. Where possible storm drain outlets should be at the toe of slopes near the elevation of receiving waters and provided with adequate armor and velocity dissipation structures to minimize potential erosion. Some impacts to inland wetlands may be justified in this case rather than placing outfalls at higher elevations outside of regulated wetlands.

Proposed lots sizes of ¾ acre or greater is may lead to some tendency for homeowners to encroach close to escarpment slopes which are inherently extremely unstable. Any activities that might destabilize vegetation in these areas must be prohibited outright or strongly discouraged through deed restrictions. Foot traffic or recreation, like sledding on the slopes, could have adverse consequences by encouraging catastrophic erosion.

The proposal to eliminate the need for an additional wastewater pumping station by burying a siphon line in a trench which crosses the unnamed tributary needs to be closely scrutinized by a professional engineer who is familiar with terrace escarpments. The stream in the area of the proposed crossing is actively downcutting, in addition, the channel could widen and expose the buried pipe on the slopes.

Stormwater Management

It is generally recommended to minimize the use of impervious surfaces where possible. Another general recommendation is that road widths should be minimized where possible. One opportunity for the Town and the applicant to pursue alternative development opportunities is with a program administered by the University of Connecticut Cooperative Extension System (UCONN/CES) with funding support from CT DEP. The primary purpose of the UCONN/CES Non-Point Education for Municipal Officials (NEMO) Program is to educate municipal land use decision makers about the connection between land use and water quality, and provide them with technical information on how to reduce the environmental impacts of new development. This reviewer encourages the town and the applicant to incorporate planning and design, construction and post construction elements of NEMO techniques. To view the myriad of information on NEMO's web site, visit them on-line at: http://www.canr.uconn.edu/ces/nemo/.

Runoff Quality and Structural Control

The site plan proposes to provide some first flush treatment through use of three detention basins. Provisions for maintenance of these basins must be enforced, and the outlets properly stabilized.

Incorporating Low Impact Development Techniques

A comprehensive and detailed approach to managing stormwater and minimizing environmental impacts should be provided with any development plan. Every reasonable opportunity to protect and improve water quality should be employed. In order to reduce the impact of development and address stormwater quality issues, the Department strongly encourages the use of Low Impact Development (LID) measures. LID site planning principles involve controlling stormwater/snowmelt runoff volume at the source and creating a hydrologically functional landscape. Key strategies for effective LID include: conserving and restoring vegetation and soils, designing the site to minimize impervious surfaces, managing stormwater close to where the rain/snow falls, and providing for maintenance and education. Consequently, we typically recommend the utilization of one, or a combination of, the following measures where feasible:

- Minimize site disturbance by limiting construction activities to areas that will contain buildings or roads. Identify special features that should be preserved (i.e. large, old trees).
- Promote sheet flow over land to the maximum extent possible by: eliminating curbs, utilizing pervious pavement, 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/. The 2008 Jordan Cove Watershed Project Final Report is available by request by contacting a CT DEP LID Coordinator at 860-418-5994.
- If soil conditions permit, the use of dry wells to manage runoff from building roofs.

- 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, and/or infiltration islands to infiltrate and treat stormwater runoff (from building roofs). For more information, visit the NEMO Planning for Stormwater web site at http://nemo.uconn.edu/tools/stormwater/index.htm.
- 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/cwp/view.asp?a=2721&q=325702&depNav_GID=1654.

Following the December 10th, 2008 ERT field review of the Village at Scantic development in Enfield, CT, several site-specific techniques are recommended. These include:

- Alternative Cul-de-sac design: Although the Town of Enfield subdivision regulations call for a teardrop shaped cul-de-sac, the minimum radius listed in the regulations and development plans is 60ft for the right of way and a 50ft radius for pavement. The Department recommends reducing the turning radius to 40 ft and the addition of a landscaped center depressed island. This width should accommodate most emergency, service, and maintenance vehicles. The narrower turning radius and bioretention area would result in a significant reduction of impervious surface coverage and stormwater runoff. Details on alternative Cul-de-sac design can be found in the Appendix and pages 4-8 to 4-9 of the CT DEP 2004 Stormwater Manual. The reduction in Cul-de-sac width would require the developer to apply for a waiver from the Town of Enfield Planning and Zoning Commission.

- The ERT documents state that the main boulevard will have rain garden islands but this is not reflected in the development plans. Proposed granite curbs are located in the center of Kerwan Lane near its intersection with Simon Road, with no evidence of rain gardens or swales. The Department recommends vegetated swales be installed along the roadways to infiltrate stormwater runoff, and that these swales be maintained either by the town or a newly created neighborhood association.

- During the field review, the developers mentioned that swales would be installed behind the garage in areas bordering steep slopes to redirect runoff away from the slopes and toward one of three detention ponds. These swales are not depicted in the development plans. The Department supports the use of swales to direct the flow of stormwater away from the steep slopes but also encourages as much on site infiltration as possible. Currently, roof leaders will pipe runoff into the detention basins. Similar to the deed restrictions for land use within the steep slope buffer area, rain gardens or dry wells could be utilized to infiltrate stormwater onsite and their continued use encouraged through deed restrictions or neighborhood association rules.

- In an effort to reduce the amount of impervious surface created by new development, the developers have proposed a community without sidewalks. The Department supports this decision to the maximum extent possible while ensuring public safety.

- As mentioned in the preliminary review by the North Central Conservation District, it is essential that all stormwater be discharged at the base of slopes with appropriate energy dissipaters to avoid erosion of steep slopes. Due to the possibility of near constant flow of water from the detention basins, the energy dissipation system needs to be carefully constructed in order to prevent erosion of the terrace escarpment slopes in the area. Specifically, it is very important that the detention basins drain at the toe of the slopes rather than at higher elevations, which could cause significant erosion.

- 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* (DEP Bulletin 34).

- 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* (DEP-PERD-GP-015).

- The North Central Conservation District previously prepared outreach materials and a PowerPoint presentation on Terrace Escarpment Slopes in the Scantic River Watershed. It is recommended that these materials be presented to potential homebuyers in the development.

Concerns

The presence of highly erodible terrace escarpment soils are the predominant environmental concern at this site. Care must be taken to ensure there is no net increase or concentration of stormwater flow from the site that will directly impact the terrace escarpment slopes, during or after development. This should be done as much as practicable by using detention and infiltration. Outflows from detention structures should be completely protected from erosion to the elevation of the existing

Conservation District Review

District staff previously conducted a review of a preliminary site plan in August of 2008. Review comments were submitted to the Inland Wetlands and Watercourses Agency at that time and are incorporated here by reference. The main focus of the review was to identify significant issues regarding wetlands and erosion control given the presence of terrace escarpments and watercourses on the property. Dr. Welti, a Geotechnical Engineer, also reviewed the preliminary site plan at that time. Dr. Welti's report of March 2008 indicates that, generally, the site is "more mature" in terms of geologic processes and may not be as vulnerable to slope failure (erosion) as other sites in the region.

The ERT was requested primarily to address concerns regarding sensitive resources on the site, including the Scantic River, which borders the northeastern edge of the property; an unnamed tributary of the Scantic, which borders the northern side of the property; several wetland areas and terrace escarpment slopes. The following section focuses on soils, erosion and sediment control, wetlands, and stormwater management.

Wetlands

In addition to the Scantic River, the unnamed tributary and their associated wetlands, there are several smaller discharge wetlands with intermittent flow to the unnamed tributary, and a few isolated wetlands located throughout the property. According to the project plans, several direct wetland alterations are proposed: a stream crossing for a sewer line, a wetland crossing for a roadway, and wetland alterations associated with the three proposed detention ponds. An alternatives assessment should be submitted for all direct wetland alterations with a discussion of feasible alternatives that would reduce or eliminate the alteration. A functional analysis should also be submitted for any wetland to be directly altered, with an assessment of proposed impacts and their effect(s) on identified functions.

Regarding the sewer line stream crossing, detailed plans are needed to identify the depth and extent of excavation, erosion and sediment control, and construction methods. Detailed plans should be reviewed by Dr. Welti, or a comparable geotechnical engineer. The recommendations provided in Dr. Welti's letter, dated December 8, 2008, entitled "Re: Proposed Sanitary Sewer Siphon Construction from Cul-De-Sac at Kerwan Drive North Across Open Space and Wetlands to Existing Sewer at Pump Station," must be incorporated into the plans. Dr. Welti expressed concerns regarding the potential for water seepage and erosion due to soils and slopes along the proposed stream crossing, and recommends measures such as erosion control blankets and a crushed stone "wedge" to stabilize slopes. He also recommends that work be completed in late summer to allow for adequate stabilization.

In addition to the sewer crossing, a wetland alteration is proposed for a roadway crossing. Chelsea Way is proposed to cross through a narrow stretch of wetland directly east of the proposed detention pond #2. This is a relatively minor wetland alteration on an intermittent stream. While the District did not perform a detailed functional assessment of the stream and wetland, the functions are likely to be limited compared to those of a larger, perennial system. Functions are likely to include groundwater discharge and conveyance. Nutrient retention and pollutant attenuation are likely to be lower in terms of functionality based on the existing soils, stream profile, and with groundwater as a primary source of flow.

Finally, wetland alterations are proposed as part of the construction of three stormwater detention ponds. All three detention ponds will discharge into existing wetlands, requiring flared outfall structures and rip rap within wetlands. Additionally, detention pond #3 will require a slightly more significant alteration, as the easternmost tip of an isolated wetland will be graded and incorporated into the detention pond.

The proposed wetland alterations are generally minor, and wetlands functions appear limited to groundwater discharge and conveyance. None of the wetlands have been identified as vernal pools. Alternative analyses must be performed to demonstrate whether any feasible options exist which might eliminate the need for each direct wetland alteration. If no alternatives are practicable and significant functions are identified, mitigation could be necessary. Any proposed mitigation measures should be designed based on a functional assessment of the wetlands which will be disturbed.

Soil Erodibility and Runoff Potential

The majority of the property is upland, comprised of Windsor Loamy Sand, 0-3% slopes as well as 3-8% slopes, together comprising approximately 69% of the total site area. The Windsor Loamy Sand is categorized as excessively drained, with a depth of 80 or more inches to the water table. This soil has a low runoff potential, and a low to very low surface runoff potential. The high infiltration rate of the Windsor Loamy Sand generally makes it suitable for stormwater treatment using infiltration. However, in Dr. Welti's review of the proposal, he cautions against excessive recharge of groundwater adjacent to slopes. Windsor Loamy Sand additionally has a low erosion hazard, its particles not easily transported as sediment.

Significant portions of the property, totaling approximately 9%, are categorized as Walpole Sandy Loam, 0-3% slopes. This soil is located in depressions or drainageways, and is poorly drained, with a maximum depth of 12 inches to the water table. Walpole Sandy Loam has a high runoff potential and a medium surface runoff potential. Its very slow infiltration rate may hinder stormwater permeation, Walpole Sandy Loam is also considered to have a low erosion hazard.

The two other major soil components located on the property are Rippowam Fine Sandy Loam and Udorthents, loamy, very steep, each covering over 7% of the total site. The Rippowam soil is primarily located on the northeastern tip of the property, bordering the western side of the Scantic River. Rippowam soil is poorly drained, with less than 18" to the water table, and has a high runoff potential. It is located in floodplains and has very low surface runoff potential. With a K erodibility factor of 0.2, this soil is not particularly prone to detachment and sedimentation. In addition, no development is currently proposed for the northeastern portion of the property, which contains the Rippowam soil. Alternatively, the proposed use of this portion of the property is preservation, accounting for 16.9 of the 19.2 total acres being as open space.

The Udorthents, loamy, very steep soil is located on terrace escarpments along the northern, southern, and northeastern portions of the property. These soils are well drained, with 54-72" to the water table, and 25-70% slopes. Udorthents soils have a moderate infiltration rate, yet based on their slopes, have a very high surface runoff potential. The K factor of this soil is moderate, at 0.37, its particles reasonably transportable as sediment. The project plans indicate that no construction will occur in areas of terrace escarpment slopes (except the sewer line crossing). The closest grading proposed in proximity to the terrace escarpments will be associated with detention pond #3 and the potential house locations on lots 36 and 37. The pond is located in the adjacent Windsor soil. Given the high infiltration rates in this soil the pond should rarely contain standing water. In addition, the grade is relatively flat in this area so there should be minimal impact on the escarpment slopes. As an additional precaution, overflow from the pond will be directed away from the escarpment slopes.

The minor soil types making up approximately 6% of the site include: Ninigret and Tisbury soils 0-5% slopes, Bancroft Silt Loam 3-8% slopes, Hinckley Gravelly Sandy Loam 15-45% slopes, and Pootatuck Fine Sandy Loam. Water accounts for 1.5% of the surface area. The relative K factors are moderate, the one outlier being Tisbury soil, with a high K factor of 0.49 due to its high silt content. The Tisbury soil allows high runoff, and is easily detached and transported. Infiltration rates are primarily high to moderate, the exception being Bancroft Silt Loam, with a slow infiltration rate.

Soil series details are provided in the attached document titled “Custom Soil Resource Report for State of Connecticut: Village at Scantic Subdivision” (found in the Appendix). The document was prepared utilizing the Web Soil Survey published by the United States Department of Agriculture, Natural Resources Conservation Service. Based on the information obtained from the Web Soil Survey, in addition to project plans and a field assessment, the soil types appear conducive to the proposed project.

Erosion and Sediment Control

Based on the plans provided, entitled “The Village at Scantic,” prepared for Villages, LLC, Enfield, CT by Aeschliman Land Surveying, PC, dated September 30, 2008, a complete erosion and sediment control plan for the proposed subdivision has not been completed. Project plans depict perimeter silt fence as the primary erosion and sediment control, but this does not constitute an adequate plan. There are some erosion control notes and details on sheet 19, but these are incomplete. A detailed plan should include a project narrative and schedule and a phasing plan. In addition, the plan must comply with the State of Connecticut “General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities”. Compliance requires preparation stormwater pollution control and erosion and sedimentation control plans. The plan must also contain provisions for temporary sediment storage during construction. Finally, the plans must be developed in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

The northeastern portion of the site contains with steep escarpment slopes. The terrain is moderate throughout the rest of the property. The proposed development consists of single-family residential units. The project plans illustrate mild to moderate cuts and fills proposed to create level residential lots, largely working with the existing topography of the site. Several localized peaks will be cut, and displaced soils will be used to fill in low areas, generally yielding a less than six-foot net change in elevation.

An additional concern regarding erosion at the site involves the location of proposed residential lots, and the future placement of houses and associated structures. Caution should be taken to ensure that the rear lots allow adequate space for swimming pools and other typical residential appurtenances without the need for extensive clearing and grading at the tops of slopes.

Stormwater Management

As described above, the majority of the proposed development consists of excessively drained soils with low runoff potential, surface runoff potential, and erosion hazard. Isolated areas of the site consist of soils less suitable for stormwater infiltration, yet most of these areas will remain undeveloped. The three proposed stormwater detention ponds should provide sufficient stormwater quantity control. Supporting calculations must be submitted to the Town Engineer for review.

The detention ponds drain to wetland areas, and the proposed flared outlets and rip rap are designed to protect the wetlands from erosion and sediment. Stormwater quality measures include sediment structures. The project must comply with the State of Connecticut general permit for stormwater, requiring the removal of at least 80% of the total suspended solids from post-construction stormwater discharges. Generally, sediment structures fulfill this requirement. However, the site may lend itself to other measures, including limited infiltration. A comprehensive stormwater plan must be developed and supporting documentation must be submitted to demonstrate that it meets the 2004 Connecticut Stormwater Quality Manual.

The developer plans to direct roof drains either into rain gardens, individual infiltration ditches, or the three detention ponds. The developer has also explored low-impact development measures, including a tear-drop shaped cul-de-sac and the omission of sidewalks. Based on developer's interpretation of Town of Enfield planning and zoning regulations, these measures are currently not allowed. The developer is pursuing the idea of rain gardens within public areas, including the proposed boulevard that will run through the subdivision. The proposed plans include dedication of 19.2 acres of land as open space, above the 15 acres required by the Town. This open space further limits impervious coverage and helps to preserve natural drainage patterns over an especially sensitive portion of the site along the Scantic River and its tributary, including steep terrace escarpment slopes.

No other issues were identified by the District during the review. Other aspects of the project, including an assessment of the open space plan, are being addressed by others.

The District is available to review the erosion control and stormwater plans once submitted.

Fisheries Resources

Scantic River

The Scantic River, a significant tributary of the Connecticut River, supports a diversity of finfish. The river is considered a major trout stream by the Inland Fisheries Division as it is annually stocked with over 9,700 adult (9-12") brook, brown, and rainbow trout. It is also known to support naturally reproducing brown trout populations often referred to as “wild brown trout.” In addition to salmonids, other stream dwelling fish include: smallmouth bass, blacknose dace, longnose dace, tessellated darter, fallfish, white sucker and common shiner. Results from stream surveys reveal that common shiner, blacknose dace, longnose dace, and white sucker are the most abundant species within this stream fish community. The river also supports catadromous American eel and anadromous sea lamprey populations.

Unnamed Watercourse to Scantic River

The unnamed stream located along the northern edge of the property is not expected to support a fish community although some fish from the Scantic River may seasonally move into this tributary especially near its confluence with the Scantic River. Regardless of its ability to support a year round fish community, this watercourse typically functions to provide a source of colder, clean and unpolluted waters to the Scantic River, which supports an increased diversity of aquatic organisms. Upstream from its confluence with the Scantic River, this watercourse is moderately entrenched or incised with visible streambank erosion and undercutting.

Fisheries Resource Concerns

Erosion and Sedimentation

Of particular development concern are proposed building lots that are contiguous with the unnamed tributary and terrace escarpments with steep slopes greater than 25 %. Proposed “building area” on lots 30, 35 and 36 are fairly close, less than 50 feet away from the top of escarpment slopes. No information was provided regarding limits of vegetative clearing nor was a detailed soil and erosion control plan submitted to detail specific controls that will be utilized to protect soil erosion and runoff. During construction, disturbed topsoil may become exposed and susceptible to runoff events into the unnamed tributary, especially near steep slope areas. This tributary can serve as a “direct conduit” for sediment to negatively impact downstream areas of the Scantic River that support fisheries resources. The negative impacts of sediment runoff have been well documented by researchers. Sediment will reduce populations of aquatic insects and fish by eliminating physical habitat while suspended sediments will reduce dissolved oxygen levels (Cordone and Kelley 1961). Suspended sediments may prevent successful nest development of trout (Bell 1986). As reported by Meehan (1991), sediment deposition can severely impact spawning substrate abundance and quality. Reductions in egg survival are caused by smothering and insufficient oxygen supply (Bell 1986). Meehan (1991) indicated that erosion and sedimentation of instream habitat could alter channel morphology by increasing the stream width-depth ratio, incidence and severity of stream bank erosion, channel braiding, and reduce pool volume and frequency.

Stormwater Management

Stormwaters that outlet to wetlands and watercourses can contain a variety of pollutants that are detrimental to aquatic organisms. Pollutants commonly found in stormwaters are hydrocarbons (gasoline and oil), herbicides, heavy metals, road salt/sand, fine silts, and coarse sediment. Nutrients in stormwater runoff can fertilize stream waters causing water quality degradation. Roadway sands used in winter deicing activities also represent a potential phosphorous loading source to the Scantic River.

Thermal loading to waterbodies from stormwaters can be a serious concern with housing development during the summer. Impervious areas act as a heat collector, with heat being imparted to stormwaters as they pass over impervious surfaces such as roadways and rooftops. In addition, stormwater temperatures can be elevated from solar radiation as they as collected and stored in wet detention basins.

Plans show the installation of three permanent stormwater detention basins; however, plans did not provide any specific information as to storage size of the detention basins. Of particular concern are detention basins that outlet to the unnamed tributary. Increases in streamflow over pre-development conditions may exacerbate instream erosion and undercutting within this incised channel.

Recommendations

Erosion and Sediment Control Plan

It is recommended to develop an aggressive and effective erosion and sediment control plan that utilizes guidance as described in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Manual. Limits of vegetative clearing should be delineated on plans. Proper installation and maintenance of erosion/sediment controls is critical to environmental well-being. This includes such mitigative measures as filter fabric barrier fences, staked hay bales, and sediment basins.

The plan should consider installation of a dual silt fence/hay bale barrier along any disturbed areas adjacent to the escarpment terrace to protect runoff into the unnamed tributary.

Land disturbance and clearing should be kept to a minimum and completed in phases. It is proposed to construct the project in four phases which should assist in minimizing the overall footprint of development susceptible to runoff. All disturbed areas should be re-stabilized as soon as possible. Exposed, unvegetated areas should be protected from storm events. The applicant and the local wetland enforcement officer should be responsible for checking this housing development on a periodic basis to ensure that all soil erosion and sediment controls are being maintained. In addition, the applicant should post a performance bond with the town to protect against possible soil erosion violations. Past siltation disturbances in Connecticut have occurred when individual contractors either improperly deployed mitigation devices or failed to maintain these devices on a regular basis, especially after storm events.

Stormwater Management

It is recommended that a formal stormwater management plan be developed utilizing the latest technology as described in the DEP 2004 Connecticut Stormwater Quality Manual. Particular attention should be made to stormwater discharges that outlet to the unnamed tributary to ensure that instream erosion is not accelerated. Details should be provided regarding design of the detention basins. It is critical that larger storm events are detained within these basins so that increases in streamflow are not observed. Design should consider the use of sediment forebays to pretreat settlement of coarse sediment particles.

Maintenance of infrastructure is very important. Detention and catch basins should be regularly maintained to minimize adverse impacts to aquatic resources.

One of the most damaging impacts from stormwater runoff is the influx of roadway sands into watercourses as a result of winter roadway deicing activities. To help mitigate for sand runoff into the Scantic River and unnamed tributary, the use of sand on paved surfaces for winter deicing should be prohibited. Many towns in the State and the CTDOT now utilize an environmental friendly salt mixture for winter deicing with no sand.

Riparian Corridor Protection

It is the policy of the CTDEP Inland Fisheries Division (IFD) that riparian corridors be protected with a 100 ft. wide undisturbed riparian buffer zone. A riparian wetland buffer is one of the most natural mitigation measures to protect the water quality and fisheries resources of watercourses. Subdivision design and development adjacent to Scantic River is consistent with CTDEP Inland Fisheries Division riparian corridor protection policy. This policy and supportive documentation can be viewed on the DEP website at:
http://www.ct.gov/dep/lib/dep/fishing/restoration/riparianpolicy.pdf and
http://www.ct.gov/dep/lib/dep/fishing/restoration/riparianpositionstatement.pdf.

Relative to the unnamed tributary to the Scantic River, serious consideration should be given to maintaining and providing an undisturbed forested buffer at the top of slope along the entire edge of the escarpment terrace to protect these areas from future landowner alterations, e.g. conversion from forest to manicured turf grass lawns. Implementation of permanently established forested buffers within property backlots should be ensured through strict deed restrictions. Town staff should periodically inspect properties to ensure compliance with deed restrictions.

Sewer line Crossing

As a best management practice, any unconfined instream work within the unnamed tributary to the Scantic River related to installation of the sewer line should be restricted to the period from

June 1 to September 30, inclusive. A June 1 through September 30 timeframe can be utilized as an effective mitigation measure for construction related disturbances.

Lawn Chemicals/Fertilizer

Whenever possible, landowners should minimize use of lawn chemicals and use fertilizers with little or no phosphorus. The use of low or non-phosphorous fertilizers can provide nutrients while avoiding threats to water quality. As previously mentioned, conversion of forested areas to lawns could be prevented thorough the use of a permanent buffers or deed restrictions along the unnamed tributary to the Scantic River.

Literature Cited

Bell, M.C. 1986. Fisheries handbook of engineering requirements and biological criteria. U.S. Army Corps of Engineers. Fish Passage Development and Evaluation Program. North Pacific Division, Portland, OR. 290 pp.

Cordone, A. J., and D. W. Kelley. 1961. The influences of inorganic sediment on the aquatic life of streams. California Fish and Game 47:189-228.

Meehan, W.R. 1991. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19, Bethesda, MD. 751 pp.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project site have been reviewed. According to our information, there are State Special Concern Species *Ligumia nastuta* (eastern pond mussel) from the vicinity of the project site.

If any waterbodies will actually be manipulated, this project could have a serious impact on the mussels. Therefore the Wildlife Division recommends:

1. That no vegetation be removed from the banks adjacent to the mussel habitat since land clearing activities will affect the mussels.
2. There can be no erosion or siltation discharged into the water that can bury and kill these mussels.
3. There can be no polluted runoff, such as chemicals or fertilizer discharged into the water, resulting from this project that can contaminate the water.

If you are planning to conduct work in any waterbodies, the Wildlife Division recommends that an invertebrate biologist familiar with the habitat requirements of these species conduct surveys. Report summarizing the results of such surveys should include habitat description, invertebrate species list and a state/resume giving the biologist qualifications. A DEP Wildlife Division permit may be required by the biologist to conduct survey work; you should ask if your biologist has one. 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 the Wildlife Division has not made a field inspection of the project nor have we seen detailed timetables for work to be done. Consultation with the Wildlife Division should not be substituted for site –specific surveys that may be require for environmental assessments,. The time of year when this work will take place will affect these 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 DEP Wildlife Division should be requested. If you have additional questions please contact Julie.Victoria@ct.gov, please reference the NDDB#16564.

In addition, according to our program ecologist Mr. Ken Metzler (DEP- Wildlife Division: 860-424-3585, Kenneth.metzler@ct.gov), this site appears to contain several areas of open, dry sandy soil patches. This site has high potential for several associated plants and invertebrate species. He recommends that an inventory conducted by a qualified ecologist/botanist and entomologist should occur prior to finalizing site development plans. Please forward the ecologist's and/or botanist's and entomologist's qualifications to Mr. Metzler directly. The results of site inventories should also be forwarded to Mr. Metzler for further review and comment. Please direct additional questions regarding these unique habitat types on this property to Mr. Metzler.

Natural Diversity Data Base information includes all information regarding critical biologic resources available to us at the time of the request. This information is a compilation of data collected over the years by the Environmental and Geographic Information Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available. If the proposed project has not been initiated within 6 months of this review, contact the NDDB for an updated review.

Please be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent permit applications submitted to DEP for the proposed site.

Archeological and Historical Review

The Office of State Archaeology (OSA) and the State Historic Preservation Office (SHPO) review suggests that the project area possess a moderate-to-high sensitivity for archaeological resources. Environmental and topographic features, especially the high terraces overlooking the Scantic River, may contain archaeological sites associated with prehistoric Native American encampments. Of particular concern is Lots 35 – 38 which extend out to the terrace edge over the river. Also, the cultivated area will permit a walkover survey for cultural resources that may have been brought to the surface due to plowing activity. Finally, the OSA and SHPO offices recommend that some of the extant farming outbuildings be photo-documented and mapped prior to removal. Photographs can be given to the Enfield Historical Society or the Office of State Archaeology at the University of Connecticut.

The OSA and SHPO recommend archaeological studies of the proposed project area pursuant to current state-of-the-art standards and SHPO's *Environmental Review Primer for Connecticut's Archaeological Resources.*

Their offices are available to provide technical assistance in the identification and evaluation of cultural resources on the project site.

Greenways Potential

This property is in close proximity to the Scantic River Park, where there is an existing greenway. This greenway was recently awarded a grant to upgrade an extension to the north, and the addition of this parcel would provide an excellent opportunity to extend it to the south. Establishing a trail system and designating recreational uses will curtail future residents of the subdivision from potentially creating multiple unplanned links and so may help prevent unknowing abuse of any sensitive resources.

If they are interested in pursuing additional trail development, this reviewer would encourage the Planning and Zoning Commission and the Scantic River Watershed Association to continue working with the CT DEP Eastern District Manager to determine how such a greenway extension could bring recreational/alternative transportation assets to the town while protecting any identified sensitive natural resources. CT DEP Recreational Trails Program Grants continues to be a potential funding source for the development of this trail link to the Scantic River Greenway.

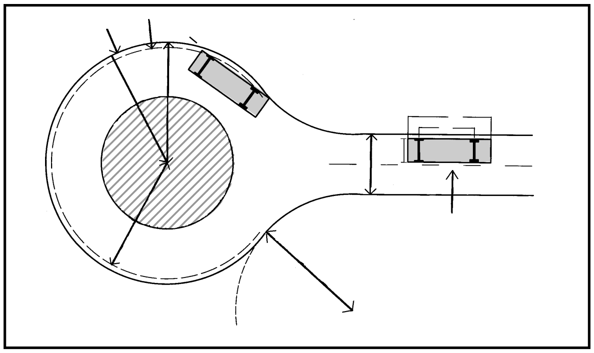
As noted in the background and as shown on the maps, there are areas of environmental sensitivity, such as classified wetland soils and a seasonal watercourse, adjacent to the property. The CT DEP geographic information system indicates that the site has been designated as a "Farmland of statewide importance", and contains important farmland soils. This means land that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. The PZC should consult with NRCS to determine how these soils can be preserved while the property is developed. Additionally, this might be an area of interest to local universities that are offering course of study in Soil Science as a potential research area.

Large existing open spaces abutting the property to the north and east between the existing greenway and the property, together can contribute to a regional greenway. Wetland and wildlife significance should be well understood and incorporated into the sites dedicated to open space. The state recently granted the town of Enfield funds to acquire 23 acres in the vicinity for open space. It is critical that the residents of the subdivision understand what sensitive species and natural resources/habitats exist in the open space and that they are enlisted to participate in open space management. Participation of the residents can curtail illegal dumping and degradation of the open spaces.

Appendix

1. **Alternative Cul-de-sac Design**
2. **Custom Soil Report for Village at Scantic Subdivision**

Cul-de-Sac Design



Description

Careful cul-de-sac design can greatly reduce the amount of impervious surface in subdivisions. To do this, cul-de-sacs (also called turnarounds or dead-ends) should use the smallest practical radius. A 40-foot turning radius will accommodate turning of most emergency, service, and maintenance vehicles, while a 30-foot radius will require the largest of these vehicles to make one backing movement in order to turn around.

Simply changing the radius from 40 feet to 30 feet can reduce the impervious coverage by about 50 percent (Schueler, 1995).

Additionally, a landscaped island can be created in the center of the cul-de-sac, where driving does not occur. This island can be designed as a depression to accept stormwater runoff from the surrounding pavement, thus furthering infiltration. A flat apron curb will stabilize roadway pavement and allow for runoff to flow into the cul-de-sac's open center.

A T-shaped (or hammerhead) turnaround reduces impervious surface even further—yielding a paved area less than half that of a 30-foot radius turnaround. Since vehicles need to make a three-point turn to drive out, T-shaped turnarounds are most appropriate on streets with ten or fewer homes.

Advantages

- Cul-de-sac designs like those suggested here result in less stormwater runoff requiring management and less impact on downstream water bodies.
- Planted cul-de-sac islands are attractive amenities
- Less paving can lower development costs

Purpose

	Water Quantity
Flow attenuation	◧
Runoff volume reduction	■

	Water Quality
Pollution prevention	
Soil erosion	□
Sediment control	◧
Nutrient loading	◧

■	Primary design benefit
◧	Secondary design benefit
□	Little or no design benefit

Cul-de Sac Design

- Reducing pavement lessens the urban heat island effect—the increase in air temperature that can occur when highly developed areas are exposed to the sun.
- Reducing pavement can help reduce the increased runoff temperature commonly associated with impervious cover.

Limitations

- City ordinances may not accommodate small radii cul-de-sacs, due to accommodations for emergency vehicles. (Some older vehicles require very large turning radii.)
- Hammerhead turnarounds require vehicles to make a three-point-turn to drive out.
- In first two to three years, planted islands require more maintenance than paving.

Requirements

Design

- If traffic volume is low (10 or fewer homes), consider a T-shaped turnaround. A dimension of 20 by 60 feet will accommodate most vehicles. (See Fig. 4)
- Design circular cul-de-sacs with a radius of 30 feet or less whenever possible. (See Fig. 2)
- Include an unpaved, depressed island, using whatever radius will allow a 20-foot-wide road. (See Fig. 3)
- To make turning easier, the pavement at rear of center island may be wider. (See Fig. 2)
- In the island, plant attractive, low-maintenance perennials or shrubs appropriate for the soil and moisture conditions.

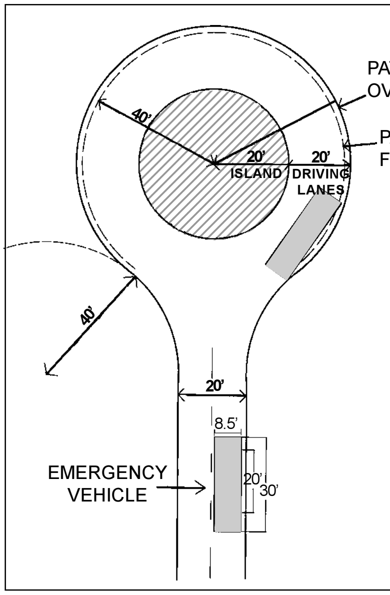
Construction

- During paving, care should be taken to avoid compacting soil in center island. Should compaction occur, it may be necessary to rip or till soils to a depth of 2 feet.
- Choose plants that will thrive when rainfall is high, as well as during droughts without watering. See On-Lot Infiltration BMP for plant list.

Maintenance

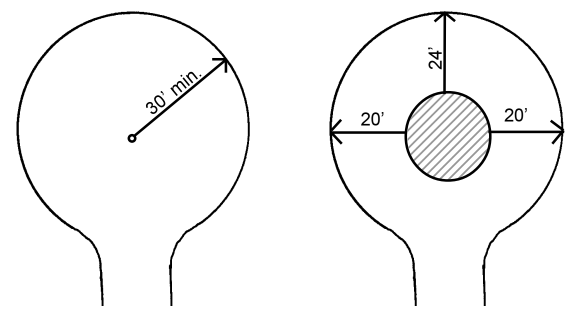
- Cul-de-sac island planting areas must be weeded monthly during the first two to three years. After that, weeding once or twice a growing season may suffice.

Cul-de-Sac Design



Cul-de-sac with offset island

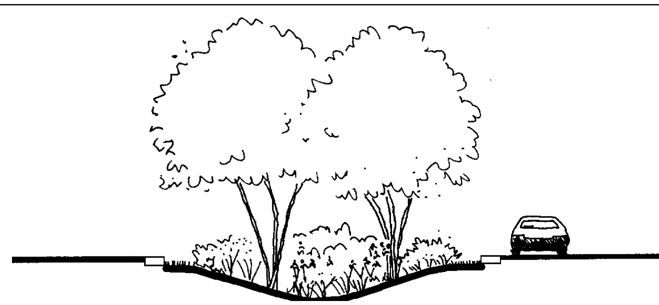
Figure 1



A 30' radius will accommodate most vehicles and reduce pavement

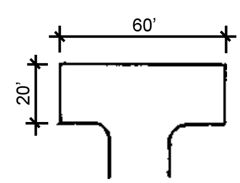
An island can be placed to allow wider lanes in rear, making turning easier.

Figure 2



Cul-de-sac infiltration island accepts stormwater from surrounding pavement. Note flat curb.

Figure 3



T-shaped turnaround

Figure 4

Sources: Adapted from Schueler, 1995, and ASCE, 1990.

Cul-de Sac Design

Sources

1. American Society of Civil Engineers, National Association of Home Builders and Urban Land Institute. 1990. *Residential Streets.* Washington, D.C.

2. Harris, Charles W. and Nicholas T. Dines. 1988. *Time-Saver Standards for Landscape Architecture.* McGraw-Hill, New York.

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4. Valley Branch Watershed District. 2000. *Alternative Stormwater Best Management Practices Guidebook.* Lake Elmo, MN.

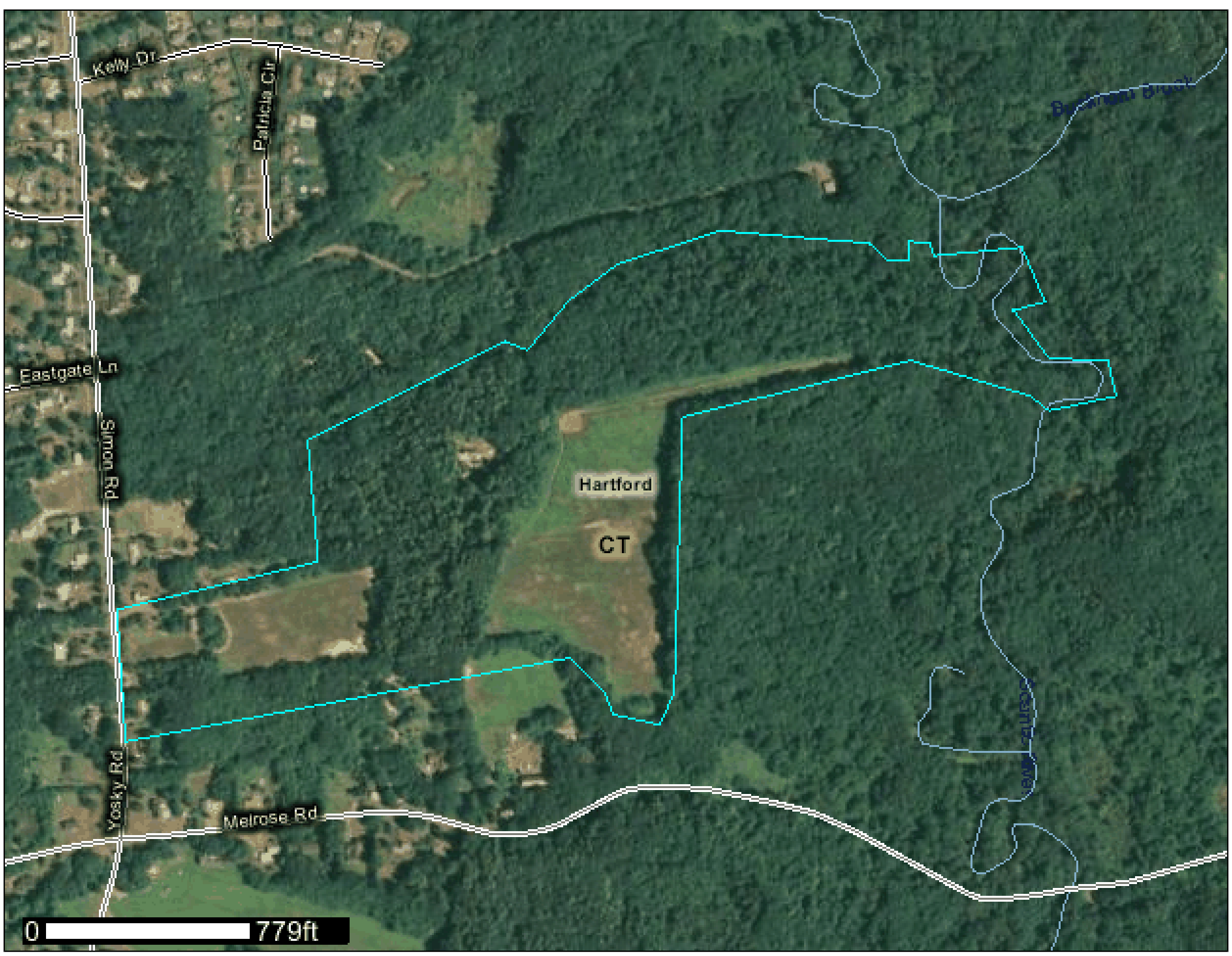
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

Village at Scantic Subdivision



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

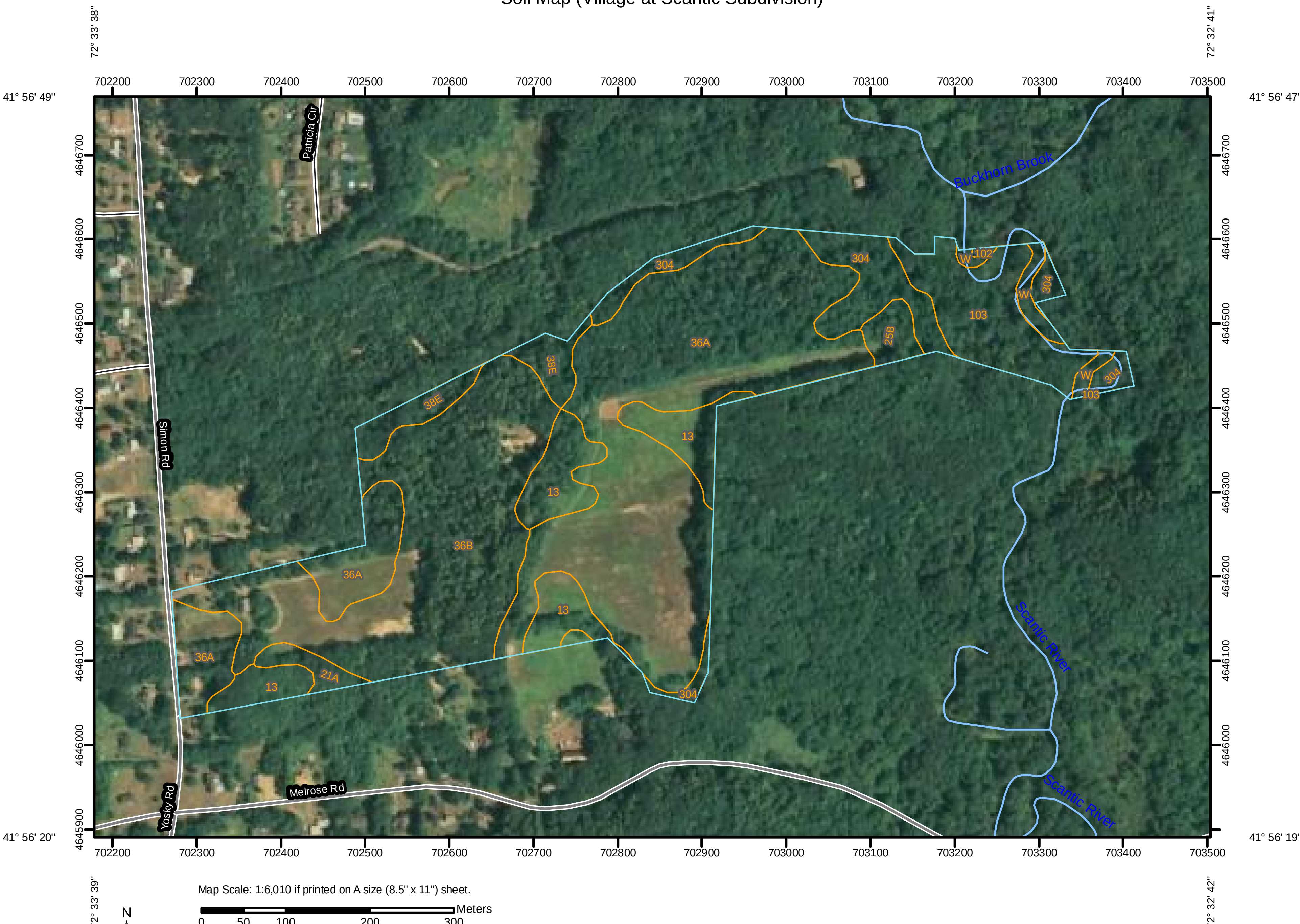
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Village at Scantic Subdivision)



Map Scale: 1:6,010 if printed on A size (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1,200 1,800

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Cities

Water Features

Oceans

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:6,020 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: 8/14/2006

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 Legend (Village at Scantic Subdivision)

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
13	Walpole sandy loam	6.2	9.2%
21A	Ninigret and Tisbury soils, 0 to 5 percent slopes	0.8	1.2%
25B	Brancroft silt loam, 3 to 8 percent slopes	0.9	1.4%
36A	Windsor loamy sand, 0 to 3 percent slopes	28.4	42.6%
36B	Windsor loamy sand, 3 to 8 percent slopes	17.6	26.3%
38E	Hinckley gravelly sandy loam, 15 to 45 percent slopes	2.2	3.3%
102	Pootatuck fine sandy loam	0.0	0.0%
103	Rippowam fine sandy loam	4.9	7.3%
304	Udorthents, loamy, very steep	4.8	7.2%
W	Water	1.0	1.5%
Totals for Area of Interest		**66.8**	**100.0%**

Map Unit Descriptions (Village at Scantic Subdivision)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used.

Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

13—Walpole sandy loam

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Walpole and similar soils: 80 percent
Minor components: 20 percent

Description of Walpole

Setting

Landform: Depressions on terraces, drainageways on terraces
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability (nonirrigated): 4w

Typical profile

0 to 1 inches: Moderately decomposed plant material
1 to 7 inches: Sandy loam
7 to 21 inches: Sandy loam
21 to 25 inches: Gravelly sandy loam
25 to 41 inches: Stratified very gravelly coarse sand to loamy fine sand
41 to 65 inches: Stratified very gravelly coarse sand to loamy fine sand

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Eskers, kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, terraces
Down-slope shape: Linear

Across-slope shape: Linear

Sudbury

Percent of map unit: 3 percent
Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear

Ninigret

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Concave

Scarboro

Percent of map unit: 2 percent
Landform: Depressions, drainageways, terraces
Down-slope shape: Concave
Across-slope shape: Concave

Raypol

Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

Raynham

Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

21A—Ninigret and Tisbury soils, 0 to 5 percent slopes

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Ninigret and similar soils: 60 percent
Tisbury and similar soils: 25 percent
Minor components: 15 percent

Description of Ninigret

Setting

Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Concave

Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.9 inches)

Interpretive groups

Land capability (nonirrigated): 2w

Typical profile

0 to 8 inches: Fine sandy loam
8 to 16 inches: Fine sandy loam
16 to 26 inches: Fine sandy loam
26 to 65 inches: Stratified very gravelly coarse sand to loamy fine sand

Description of Tisbury

Setting

Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.6 inches)

Interpretive groups

Land capability (nonirrigated): 2w

Typical profile

0 to 8 inches: Silt loam
8 to 18 inches: Silt loam
18 to 26 inches: Silt loam
26 to 60 inches: Stratified very gravelly sand to loamy sand

Minor Components

Merrimac

Percent of map unit: 3 percent
Landform: Kames, outwash plains, terraces
Down-slope shape: Linear

Across-slope shape: Linear

Agawam

Percent of map unit: 3 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Enfield

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Linear

Haven

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Linear

Sudbury

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear

Raypol

Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

Walpole

Percent of map unit: 1 percent
Landform: Depressions on terraces, drainageways on terraces
Down-slope shape: Concave
Across-slope shape: Concave

Unnamed, red parent material

Percent of map unit: 1 percent

25B—Brancroft silt loam, 3 to 8 percent slopes

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 52 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Brancroft and similar soils: 80 percent

Minor components: 20 percent

Description of Brancroft

Setting

Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-silty glaciolacustrine deposits

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability (nonirrigated): 2e

Typical profile

0 to 6 inches: Silt loam
6 to 17 inches: Silt loam
17 to 22 inches: Silty clay loam
22 to 32 inches: Silt loam
32 to 43 inches: Silty clay loam
43 to 66 inches: Silt loam

Minor Components

Elmridge

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Linear

Berlin

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear

Maybid

Percent of map unit: 3 percent
Landform: Depressions, drainageways, terraces
Down-slope shape: Concave
Across-slope shape: Concave

Scitico

Percent of map unit: 2 percent
Landform: Depressions, drainageways, terraces
Down-slope shape: Concave
Across-slope shape: Concave

Unnamed, sand or gravel substratum

Percent of map unit: 2 percent

Unnamed, till substratum

Percent of map unit: 2 percent

Belgrade

Percent of map unit: 1 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear

36A—Windsor loamy sand, 0 to 3 percent slopes

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 38 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Windsor and similar soils: 80 percent
Minor components: 20 percent

Description of Windsor

Setting

Landform: Kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian sands over sandy glaciofluvial deposits derived from granite and/or schist and/or gneiss

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Land capability (nonirrigated): 2s

Typical profile

0 to 1 inches: Moderately decomposed plant material
1 to 3 inches: Loamy sand
3 to 9 inches: Loamy sand

9 to 21 inches: Loamy sand
21 to 25 inches: Sand
25 to 65 inches: Sand

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Eskers, kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Agawam

Percent of map unit: 3 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Deerfield

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Concave

Sudbury

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear

Ninigret

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Concave

Unnamed, neutral subsoil

Percent of map unit: 1 percent

36B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 38 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Windsor and similar soils: 80 percent
Minor components: 20 percent

Description of Windsor

Setting

Landform: Kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian sands over sandy glaciofluvial deposits derived from granite and/or schist and/or gneiss

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Land capability (nonirrigated): 2s

Typical profile

0 to 1 inches: Moderately decomposed plant material
1 to 3 inches: Loamy sand
3 to 9 inches: Loamy sand
9 to 21 inches: Loamy sand
21 to 25 inches: Sand
25 to 65 inches: Sand

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Eskers, kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Agawam

Percent of map unit: 3 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Deerfield

Percent of map unit: 2 percent

Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Concave

Sudbury

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear

Ninigret

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Concave

Unnamed, neutral subsoil

Percent of map unit: 1 percent

38E—Hinckley gravelly sandy loam, 15 to 45 percent slopes

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Hinckley and similar soils: 80 percent
Minor components: 20 percent

Description of Hinckley

Setting

Landform: Eskers, kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.3 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 8 inches: Gravelly sandy loam
8 to 20 inches: Very gravelly loamy sand
20 to 27 inches: Very gravelly sand
27 to 42 inches: Stratified cobbly coarse sand to extremely gravelly sand
42 to 60 inches: Stratified cobbly coarse sand to extremely gravelly sand

Minor Components

Windsor

Percent of map unit: 5 percent
Landform: Kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Agawam

Percent of map unit: 3 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Sudbury

Percent of map unit: 2 percent
Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear

Walpole

Percent of map unit: 1 percent
Landform: Depressions on terraces, drainageways on terraces
Down-slope shape: Concave
Across-slope shape: Concave

Scarboro

Percent of map unit: 1 percent
Landform: Depressions, drainageways, terraces
Down-slope shape: Concave
Across-slope shape: Concave

Unnamed, red parent material

Percent of map unit: 1 percent

Rock outcrop

Percent of map unit: 1 percent

Unnamed, gravelly silt loam solum

Percent of map unit: 1 percent

102—Pootatuck fine sandy loam

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Pootatuck and similar soils: 80 percent
Minor components: 20 percent

Description of Pootatuck

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Coarse-loamy alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water capacity: Low (about 5.5 inches)

Interpretive groups

Land capability (nonirrigated): 2w

Typical profile

0 to 4 inches: Fine sandy loam
4 to 16 inches: Fine sandy loam
16 to 21 inches: Fine sandy loam
21 to 29 inches: Sandy loam
29 to 35 inches: Stratified very gravelly coarse sand to loamy fine sand
35 to 40 inches: Stratified very gravelly coarse sand to loamy fine sand
40 to 65 inches: Stratified very gravelly coarse sand to loamy fine sand

Minor Components

Suncook

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Convex

Occum

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Rippowam

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave

Lim

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave

Limerick

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave

Saco

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave

103—Rippowam fine sandy loam

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Rippowam and similar soils: 80 percent
Minor components: 20 percent

Description of Rippowam

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Coarse-loamy alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water capacity: Low (about 5.9 inches)

Interpretive groups

Land capability (nonirrigated): 4w

Typical profile

0 to 5 inches: Fine sandy loam
5 to 12 inches: Fine sandy loam
12 to 19 inches: Fine sandy loam
19 to 24 inches: Sandy loam
24 to 27 inches: Sandy loam
27 to 31 inches: Loamy sand
31 to 65 inches: Stratified very gravelly coarse sand to loamy fine sand

Minor Components

Suncook

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Convex

Occum

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Pootatuck

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave

Lim

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave

Limerick

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave

Saco

Percent of map unit: 2 percent
Landform: Flood plains

Down-slope shape: Concave
Across-slope shape: Concave

304—Udorthents, loamy, very steep

Map Unit Setting

Elevation: 0 to 1,200 feet
Mean annual precipitation: 37 to 52 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days

Map Unit Composition

Udorthents and similar soils: 90 percent
Minor components: 10 percent

Description of Udorthents

Setting

Landform: Escarpments
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Properties and qualities

Slope: 25 to 70 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.8 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 5 inches: Loam
5 to 21 inches: Gravelly loam
21 to 80 inches: Very gravelly sandy loam

Minor Components

Shaker

Percent of map unit: 3 percent
Landform: Depressions, drainageways, terraces
Down-slope shape: Concave
Across-slope shape: Concave

Scitico

Percent of map unit: 3 percent
Landform: Depressions, drainageways, terraces
Down-slope shape: Concave
Across-slope shape: Concave

Maybid

Percent of map unit: 2 percent
Landform: Depressions, drainageways, terraces
Down-slope shape: Concave
Across-slope shape: Concave

Unnamed, frequently flooded

Percent of map unit: 1 percent
Landform: Drainageways

Raynham

Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave

W—Water

Map Unit Composition

Water: 100 percent

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Erosion

This folder contains a collection of tabular reports that present soil erosion factors and groupings. The reports (tables) include all selected map units and components for each map unit. Soil erosion factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

RUSLE2 Related Attributes (Village at Scantic Subdivision)

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factors Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the surface horizon.

Report—RUSLE2 Related Attributes (Village at Scantic Subdivision)

RUSLE2 Related Attributes– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
13—Walpole sandy loam							
Walpole	80	D	—	3	0.0	0.0	0.0
21A—Ninigret and Tisbury soils, 0 to 5 percent slopes							
Ninigret	60	B	.37	3	61.5	31.0	7.5
Tisbury	25	B	.49	3	32.5	60.0	7.5
25B—Brancroft silt loam, 3 to 8 percent slopes							
Brancroft	80	C	.28	5	15.0	65.0	20.0
36A—Windsor loamy sand, 0 to 3 percent slopes							
Windsor	80	A	—	2	0.0	0.0	0.0
36B—Windsor loamy sand, 3 to 8 percent slopes							
Windsor	80	A	—	2	0.0	0.0	0.0
38E—Hinckley gravelly sandy loam, 15 to 45 percent slopes							
Hinckley	80	A	.28	2	64.0	30.0	6.0
102—Pootatuck fine sandy loam							
Pootatuck	80	B	.28	3	66.0	30.0	4.0
103—Rippowam fine sandy loam							
Rippowam	80	D	.20	3	59.0	37.0	4.0
304—Udorthents, loamy, very steep							
Udorthents	90	B	.37	5	42.0	46.0	12.0
W—Water							
Water	100	—	—	—	—	—	—

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Water Features (Village at Scantic Subdivision)

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

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 four hydrologic soil groups are:

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.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Water Features– State of Connecticut										
Map unit symbol and soil name	**Hydrologic group**	**Surface runoff**	**Month**	**Water table**		**Ponding**			**Flooding**	
				Upper limit	**Lower limit**	**Surface depth**	**Duration**	**Frequency**	**Duration**	**Frequency**
				Ft	*Ft*	*Ft*				
13—Walpole sandy loam										
Walpole	D	Very low	January	0.0-1.0	>6.0	—	—	None	—	None
	D	Very low	February	0.0-1.0	>6.0	—	—	None	—	None
	D	Very low	March	0.0-1.0	>6.0	—	—	None	—	None
	D	Very low	April	0.0-1.0	>6.0	—	—	None	—	None
	D	Very low	May	0.0-1.0	>6.0	—	—	None	—	None
	D	Very low	November	0.0-1.0	>6.0	—	—	None	—	None
	D	Very low	December	0.0-1.0	>6.0	—	—	None	—	None

Water Features– State of Connecticut										
Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
21A—Ninigret and Tisbury soils, 0 to 5 percent slopes										
Ninigret	B	Very low	January	1.5-2.5	>6.0	—	—	None	—	None
	B	Very low	February	1.5-2.5	>6.0	—	—	None	—	None
	B	Very low	March	1.5-2.5	>6.0	—	—	None	—	None
	B	Very low	April	1.5-2.5	>6.0	—	—	None	—	None
	B	Very low	May	2.5-5.0	>6.0	—	—	None	—	None
	B	Very low	September	1.5-2.5	>6.0	—	—	None	—	None
	B	Very low	November	1.5-2.5	>6.0	—	—	None	—	None
	B	Very low	December	1.5-2.5	>6.0	—	—	None	—	None
Tisbury	B	Low	January	1.5-2.5	>6.0	—	—	None	—	None
	B	Low	February	1.5-2.5	>6.0	—	—	None	—	None
	B	Low	March	1.5-2.5	>6.0	—	—	None	—	None
	B	Low	April	1.5-2.5	>6.0	—	—	None	—	None
	B	Low	May	2.5-5.0	>6.0	—	—	None	—	None
	B	Low	September	1.5-2.5	>6.0	—	—	None	—	None
	B	Low	November	1.5-2.5	>6.0	—	—	None	—	None
	B	Low	December	1.5-2.5	>6.0	—	—	None	—	None

Water Features– State of Connecticut										
Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
25B—Brancroft silt loam, 3 to 8 percent slopes										
Brancroft	C	Medium	January	1.5-2.5	>6.0	—	—	None	—	None
	C	Medium	February	1.5-2.5	>6.0	—	—	None	—	None
	C	Medium	March	1.5-2.5	>6.0	—	—	None	—	None
	C	Medium	April	1.5-2.5	>6.0	—	—	None	—	None
	C	Medium	October	1.5-2.5	>6.0	—	—	None	—	None
	C	Medium	November	1.5-2.5	>6.0	—	—	None	—	None
	C	Medium	December	1.5-2.5	>6.0	—	—	None	—	None
36A—Windsor loamy sand, 0 to 3 percent slopes										
Windsor	A	Very low	Jan-Dec	—	—	—	—	None	—	—
36B—Windsor loamy sand, 3 to 8 percent slopes										
Windsor	A	Low	Jan-Dec	—	—	—	—	None	—	—
38E—Hinckley gravelly sandy loam, 15 to 45 percent slopes										
Hinckley	A	High	Jan-Dec	—	—	—	—	None	—	—
102—Pootatuck fine sandy loam										
Pootatuck	B	Very low	January	1.5-2.5	>6.0	—	—	None	Brief	Frequent
	B	Very low	February	1.5-2.5	>6.0	—	—	None	Brief	Frequent
	B	Very low	March	1.5-2.5	>6.0	—	—	None	Brief	Frequent
	B	Very low	April	1.5-2.5	>6.0	—	—	None	Brief	Frequent
	B	Very low	November	1.5-2.5	>6.0	—	—	None	Brief	Frequent
	B	Very low	December	1.5-2.5	>6.0	—	—	None	Brief	Frequent

Water Features– State of Connecticut										
Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
103—Rippowam fine sandy loam										
Rippowam	D	Very low	January	0.0-1.5	>6.0	—	—	None	Brief	Frequent
	D	Very low	February	0.0-1.5	>6.0	—	—	None	Brief	Frequent
	D	Very low	March	0.0-1.5	>6.0	—	—	None	Brief	Frequent
	D	Very low	April	0.0-1.5	>6.0	—	—	None	Brief	Frequent
	D	Very low	May	0.0-1.5	>6.0	—	—	None	Brief	Frequent
	D	Very low	June	0.0-1.5	>6.0	—	—	None	—	—
	D	Very low	September	0.0-1.5	>6.0	—	—	None	—	—
	D	Very low	October	0.0-1.5	>6.0	—	—	None	Brief	Frequent
	D	Very low	November	0.0-1.5	>6.0	—	—	None	Brief	Frequent
	D	Very low	December	0.0-1.5	>6.0	—	—	None	Brief	Frequent
304—Udorthents, loamy, very steep										
Udorthents	B	Very high	January	4.5-6.0	>6.0	—	—	None	—	None
	B	Very high	February	4.5-6.0	>6.0	—	—	None	—	None
	B	Very high	March	4.5-6.0	>6.0	—	—	None	—	None
	B	Very high	April	4.5-6.0	>6.0	—	—	None	—	None
	B	Very high	November	4.5-6.0	>6.0	—	—	None	—	None
	B	Very high	December	4.5-6.0	>6.0	—	—	None	—	None
W—Water										
Water	—	—	Jan-Dec	—	—	—	—	None	—	—

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About The Team

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

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

Purpose of the Team

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

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

Requesting a Review

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

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