

Connecticut Ecosystems LLC

- Wetland Delineation
- Wetland & Aquatic Evaluation
- Mitigation
- Natural Resource Inventory
- Permit Assistance
- Expert Testimony



WETLANDS REPORT

TUCKER DRIVE

Torrington, Connecticut

September 9, 2013

CE Project 13-9 File c:\soils 2013\13-9\report.doc



Contents

1.0 INTRODUCTION	1
2.0 SITE DESCRIPTION	1
3.0 LANDSCAPE CONTEXT	1
4.0 SOILS	1
5.0 UPLAND COVER TYPES	1
6.0 WETLAND COVER TYPES	2
6.1 Wetland 1 (W1).....	2
6.1.1 Wetland Description	2
6.1.2 Wetland Water Regime.....	3
6.2 Wetland 2	3
6.2.1 Wetland Description	3
6.2.2 Wetland Water Regime.....	3
6.2.3 URA Description	3
6.2.4 Wetland Functions and Values	4
7.0 DEP NATURAL DIVERSITY DATA BASE	4
8.0 WILDLIFE.....	4
9.0 REGULATED ACTIVITIES.....	4
10.0 STORMWATER QUALITY	5
11.0 EROSION & SEDIMENTATION CONTROLS	6
12.0 FEASIBLE AND PRUDENT ALTERNATIVES.....	6

Figures		
<i>Figure</i>	<i>Description</i>	<i>Following Page</i>
1	Site Location Map	1
2	Aerial Photograph	1
3	CTDEEP Natural Diversity Database Map	1
Tables		
<i>Table</i>	<i>Description</i>	<i>Following Page</i>
1	Wetland Summary	2
Appendices		
<i>Appendix</i>	<i>Description</i>	
1	Vegetative Inventory	
2	Wildlife Inventory	
3	Wetland Assessment Data Sheets	
4	Soils Report	

COLOR PHOTOGRAPHS



Tucker Drive Torrington, CT 9/3/13 1. Boulders abundant in Upland Review Area
2. Wetland 2 3. Yard waste dumped onto property 4. Locally dense stand of multiflora rose in Wetland 1
5. Swale/ditch at west end of Wetland 1 6. Shallow pool of trapped water in Wetland 1

1.0 INTRODUCTION

The construction of housing units by the Housing Authority of the City of Torrington is proposed on a 17.08-acre parcel of land in Torrington, CT.

Connecticut Ecosystems LLC was retained to delineate the on-site wetlands and watercourses and conduct a site plan review, the results of which are presented in this report. Mr. Edward M. Pawlak, Registered Soil Scientist and Certified Professional Wetland Scientist, inspected the subject property on June 12 and 21, 2013 to delineate the wetlands and watercourses, and on September 3, 2013 to collect biological data. Mr. Thomas Pietras, Registered Soil Scientist, collaborated with Mr. Pawlak on the wetland delineation on June 21, 2013. Connecticut Ecosystems LLC provided recommendations on site plan design to the project engineer, TO Design, Inc.

2.0 SITE DESCRIPTION

The 17.08-acre subject property is bordered to the south by East Main Street, to the west by Putnam Street, to the north by Meadowview Drive, and to the east by Tucker Drive (Figure 2). Slopes on the property range from gentle to moderate.

3.0 LANDSCAPE CONTEXT

The property is part of a relatively small landscape block that is bordered on all sides by residential and commercial development (Figure 2). This undeveloped wooded landscape block is a small island of natural habitat within a heavily developed landscape.

4.0 SOILS

Soils on the property are described in Appendix 4. Both the wetland and non-wetland soils on the property are underlain by a shallow, compact hardpan which results in a perched seasonally high water table.

5.0 UPLAND COVER TYPES

Whitlock et al. (1994) define “cover type” as “*a portion of a wetland or upland system that contains a uniform plant community composition and structure or that is influenced by one hydrologic regime.*” Below is a description of the upland cover type found on the property.



Figure 1. Site Location Map
Project Torrington, CT
Connecticut Ecosystems LLC
September 5, 2013
Torrington, CT Quadrangle Map

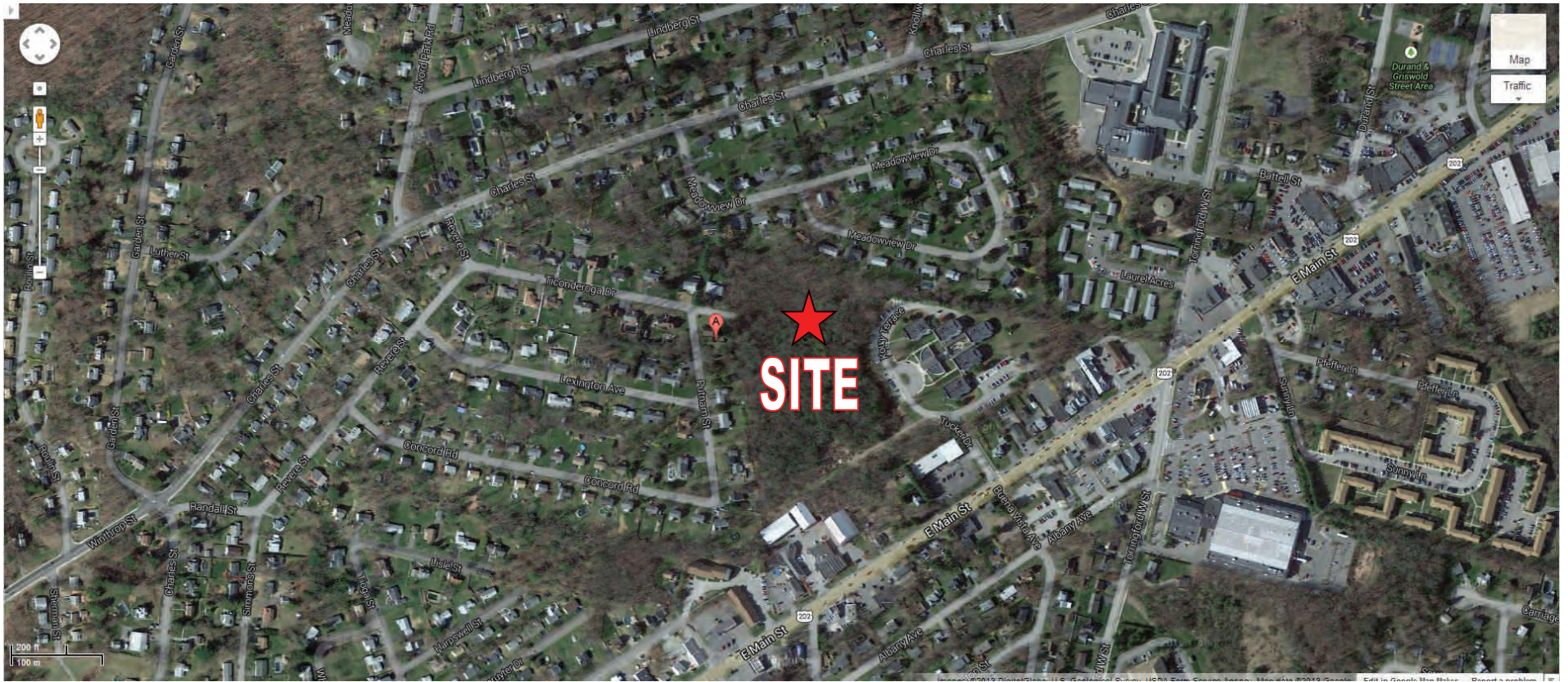


Figure 2. Aerial Photograph
Project Torrington, CT
Connecticut Ecosystems LLC
September 5, 2013

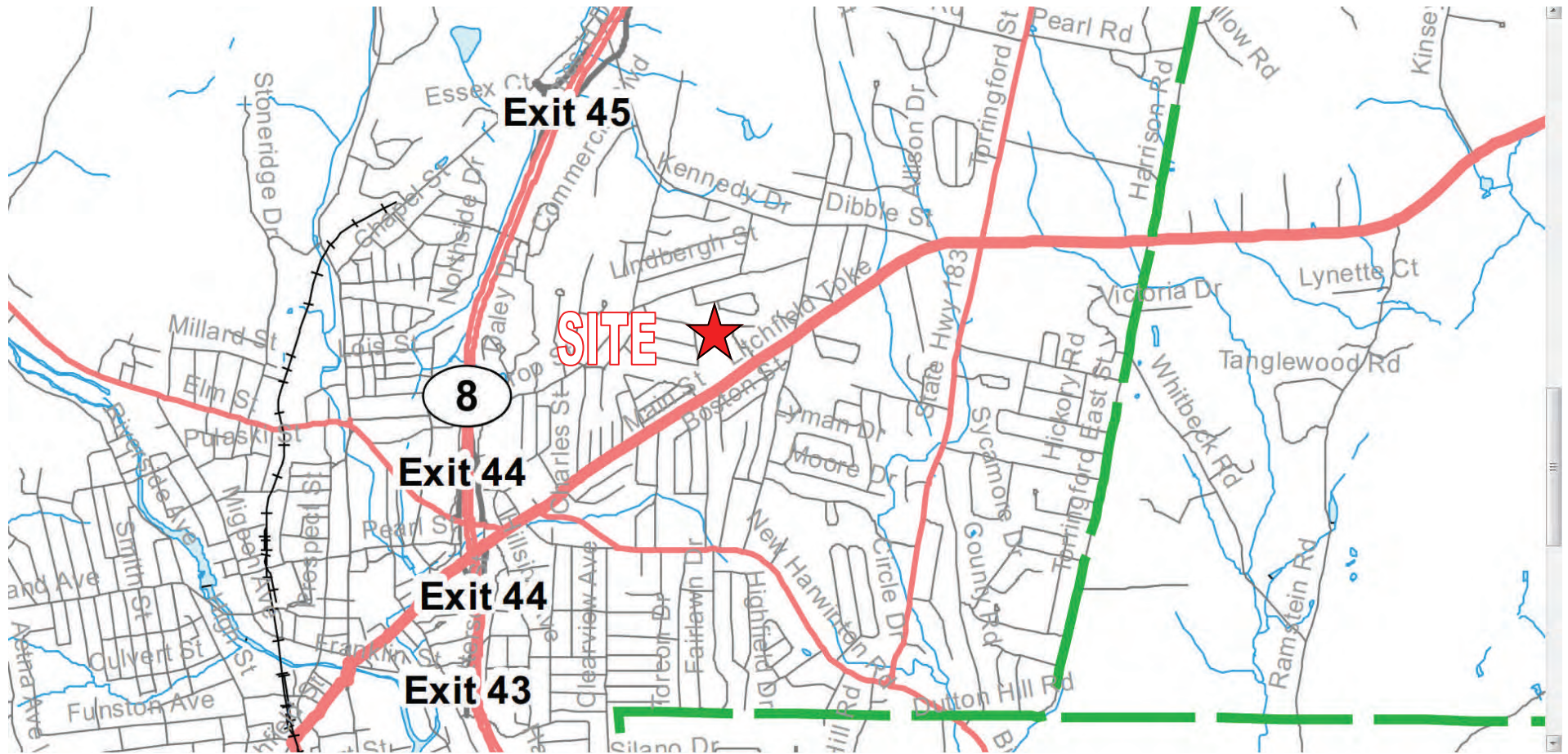


Figure 3. CTDEEP Natural Diversity Database Map
Project Torrington, CT
Connecticut Ecosystems LLC
September 5, 2013

5.1 Mixed Forest

This wooded cover type occurs on the easterly portion of the property across gentle to moderate slopes. The mature second growth forest supports eastern hemlock, hickory, red maple, black birch and tulip poplar trees. Large boulders are abundant on the forest floor (Photo 1).

6.0 WETLAND COVER TYPES

The subject property contains a total of 4.5 acres (26 percent) of wetlands.

In this section of the report the following information is provided for each on-site wetland:

- Description of wetland cover type
- Wetland water regime(s)
- Description of 75-foot wide Upland Review Area (URA), as defined by the City of Torrington Inland Wetland Regulations
- Discussion of the principal functions associated with each on-site wetland. A modified version of the “Highway Methodology”, developed by the U.S. Army Corps of Engineers, was used to assess wetland functions and values (Appendix 3). Table 1 lists the principal functions and values associated with the on-site wetlands.

6.1 Wetland 1 (W1)

6.1.1 Wetland Description

Wetland 1 is a large deciduous wooded swamp that occupies the western and central portions of the project site. The slope of the swamp drops to the west. Large boulders and rotting logs are common on the forest floor.

The swamp is characterized by seasonally active groundwater discharges that coalesce into numerous small drainage channels that carry the surface water downslope. Small, shallow depressions in the lower portions of the swamp trap and collect shallow water intermittently (Photo 6). A ditch/swale at the western end of the swamp, along the property line, intercepts surface water flowing across the swamp and directs it away from the rear yards of houses off-site to the west (Photo 5). Drainage in the ditch eventually enters a perforated pipe at the base of the ditch and is directed down Concord Road through a 24” pipe to Besse Pond.

Red maple and eastern hemlock are the dominant canopy trees in the swamp, with spicebush, multiflora rose, Japanese barberry, jewelweed and other species growing in the understory (Appendix 1). The shrub stratum is locally very dense, particularly within

Table 1. Wetland Summary		
Principal Functions/Values	Wetland 1	Wetland 2
<i>Groundwater Recharge</i>		
<i>Groundwater Discharge</i>	P	P
<i>Floodflow Alteration</i>	P	
<i>Fish & Shellfish Habitat</i>		
- <i>Ponds & Lakes</i>		
- <i>Streams & Rivers</i>		
<i>Pollutant Removal</i>	P	
<i>Production Export</i>	P	
<i>Recreation</i>		
<i>Wildlife Habitat</i>	P	
<i>Educational/ Scientific Value</i>		
<i>Uniqueness/Heritage</i>		
WETLAND DATA		
<i>Type (*)</i>	DWS	DWS
<i>Water Regime (**)</i>	SS	SS
<i>Soil Parent Material (***)</i>	T	T

Note: P=Principal Function, NA=Not Applicable, see Appendix 3 for data sheets
 (*) DWS=deciduous wooded swamp, CWS=coniferous wooded swamp, BSS=bushy shrub swamp, SSS=sapling shrub swamp, SM=shallow marsh, DM=deep marsh, WM=wet meadow, OW=open water
 (**) Water Regimes based upon Cowardin et al. (1979) and Golet et al. (1993):

<u>Water Regime</u>	<u>Definition</u>
Permanently flooded (PF)	Water covers surface throughout the year, in all years.
Intermittently exposed (IE)	Surface water present through the year, except during extreme drought.
Semipermanently flooded (SF)	Surface water persists throughout the growing season in most years.
Seasonally flooded (SEF)	Surface water present for extended periods, especially early in growing season.
Seasonally saturated (SS)	Soil saturated to surface, especially early in growing season, but water table usually well below surface for most of season.
Temporarily flooded (TF)	Surface water present for brief periods of growing season, but water table lies far below surface for most of the season.
Intermittently flooded (IF)	Substrate usually exposed, but surface water present for variable periods.
Artificially flooded (AF)	Flooding caused by dikes, dams, pumps, etc.,

(***) T=glacial till O=outwash G=glaciolacustrine F=floodplain OG=Organics

multiflora rose thickets (Photo 4). Yard waste has been deposited in and near the northern end of the swamp (Photo 3).

6.1.2 Wetland Water Regime

Golet et al. (1993) define wetland water regime as follows: “*the elevation and degree of fluctuation of the water table with respect to the land surface over time.*” They note that the water level in a wetland can vary widely among years, depending largely upon precipitation levels. Thus, water regime is best interpreted as characterizing a wetland in *most* years. The various wetland water regimes, along with their definitions, are listed in the center of the Wetland Data Sheet found in Appendix 3.

Wetland 1 is characterized by a seasonally saturated water regime.

6.1.3 URA Description

The URA associated with Wetland 1 is described in section 5.1 of this report.

6.1.4 Wetland Functions & Values

Wetland 1 is associated with the following principal functions: groundwater discharge, floodflow alteration, pollutant removal, production export, and wildlife habitat (Table 1, Appendix 3). The features of the swamp that contribute positively to these functions are enumerated on the data sheets found in Appendix 3.

6.2 Wetland 2

6.2.1 Wetland Description

Wetland 2 is a small isolated pocket located at the northeast corner of the property (Photo 2). A very low flow of surface water, emanating from a groundwater discharge, was discharging from this wetland on September 3, 2013. The shrub stratum of this wetland is dense (Photo 2), consisting of multiflora rose, Japanese barberry, spicebush and burning bush. Red maple, American elm and shagbark hickory grow in the overstory.

6.2.2 Wetland Water Regime

Wetland 2 is characterized by a seasonally saturated water regime.

6.2.3 URA Description

The URA associated with Wetland 2 is described in section 5.1 of this report.

6.2.4 Wetland Functions and Values

Due to its very small size, the functions and values associated with Wetland 2 were assessed using best professional judgment and experience, rather than the Highway Methodology. The very small size of this wetland limits its capacity to provide significant biological and hydrological functions. The only principal functions associated with this wetland is groundwater discharge.

7.0 DEP NATURAL DIVERSITY DATA BASE

According to the online Connecticut Department of Environmental and Energy Protection (CTDEEP) Natural Diversity Database map (Figure 3), there are no records of any State- or Federal-listed species on the property. No listed species were observed during the three site inspections.

8.0 WILDLIFE

On September 3, 2013 wildlife species were observed by songs/calls, and by cover searching beneath fallen logs and bark. A total of ten wildlife species were identified on the property on that date, including six avians, three amphibians, and one mammal (Appendix 2). None of these are Threatened, Endangered or Special Concern species. Considering the habitat that occurs on the property, it is very likely that additional species occur there, including wood thrush, American robin, mourning dove, downy woodpecker, garter snake and white-tailed deer, none of which are rare or uncommon in Connecticut.

Three juvenile wood frogs were observed in Wetland 1 on September 3, 2013. This amphibian species is typically associated with seasonally flooded vernal pools which remain inundated in the spring and early summer for at least two months. There are no classic basin depression vernal pools on the property, but it is likely that these juvenile wood frogs emerged from one of the small shallow depressional puddles (e.g., see Photo 6) on the site that trap and retain surface water emanating from a groundwater discharge. It is possible that one or more of these small puddles retains water long enough during a wet spring to allow wood frogs to complete metamorphosis and emerge as juveniles. The fact that only three juvenile wood frogs were observed suggests that the population of wood frogs on the site is very small, consistent with the small wooded landscape block which the project site is part of (Figure 2).

9.0 REGULATED ACTIVITIES

9.1 Wetlands & Watercourses

No disturbance to wetlands or watercourses is proposed by the project.

9.2 Upland Review Area

The Torrington Inland Wetland Regulations define an Upland Review Area (URA) that extends 75 feet from the edge of wetlands.

The intent of the Inland Wetlands and Watercourses Act is to protect the functions and values of wetlands, not Upland Review Areas. According to Mr. Steve Tessitore of the Connecticut DEP, wetland commissions regulate activities in the in upland areas that are likely to affect wetlands or watercourses; they do not regulate the URA itself.

Importantly, development within a URA does not necessarily affect or impact the functions of the associated wetland or watercourse. The URA is a zone of more or less arbitrary width in which the Commission has decided an activity may result in an indirect impact to an adjacent wetland or watercourse. However, it is necessary to evaluate the site-specific functions of the wetland or watercourse in question, the physical features of the associated URA (soils, slope, vegetation), and the details of the site plan to assess the likelihood of any impacts to wetlands or watercourses.

The total proposed URA disturbance is 0.26 acres.

The project team established a goal of maintaining to the greatest feasible extent a 50 foot wide undisturbed vegetated zone between wetlands and the proposed development (grading, clearing and structures). For the most part this goal has been achieved, and in some areas the wooded zone will be greater than 50 feet wide. In the professional opinion of the author, the wooded upland zone that will be preserved is sufficiently wide to protect the wetland from disturbances during and post-construction.

10.0 STORMWATER QUALITY

The stormwater management system includes several important elements to renovate the runoff from the site before it is discharged to a wetland:

- The parking areas will be constructed with pervious pavement that will allow infiltration of the runoff, thus reducing the volume of runoff generated by the development.
- The runoff will be pretreated with a hydrodynamic separator which will remove sediments and oil/grease before it is discharged to a stormwater basin for further treatment.
- The clean runoff from the roof of the smaller proposed building will be directed to a level spreader to promote infiltration and overland flow rather than a concentrated point discharge.

- The bottom of the stormwater basin will be depressed below the outlet structure so that the Water Quality Volume (runoff generated by a one-inch storm event) will be fully retained and not discharged from the basin, allowing for extended renovation.
- The runoff from the stormwater basin will be directed to a long linear level spreader (a stone-filled trench) that will promote overland flow as opposed to a concentrated point discharge and minimize the risk of erosion.

11.0 EROSION & SEDIMENTATION CONTROLS

As noted earlier, the project site is characterized by soils with a shallow hardpan that creates a seasonal high groundwater table. In recognition of this, it is recommended that earthwork (excavation, filling and grading) only take place between June 15-September 15. This limitation on earthwork would avoid the typically wet spring months, and would allow enough time at the end of the growing season for the germination and growth of vegetation to stabilize disturbed soils.

At the suggestion of the Torrington Environmental Planner, all silt fence will be backed up by a wood chip berm for additional filtration of runoff and to strengthen the silt fence barrier. The wood chip berms can be left in place and allowed to slowly decompose over time.

12.0 FEASIBLE AND PRUDENT ALTERNATIVES

The State of Connecticut general statutes define “feasible and prudent alternative” as follows: “*“a feasible alternative is one that is “able to be constructed or implemented consistent with sound engineering principles.” The term “prudent” means “economically and otherwise reasonable in light of the social benefits to be derived from the proposed regulated activity provided cost may be considered in deciding what is prudent, and further provided that a mere showing of expense will not necessarily mean an alternative is imprudent.”*”

The site plans have been revised in several important ways to minimize the potential for impacts to wetlands and watercourses:

- An early iteration of the plans showed a stormwater basin at the north end of the property, in very close proximity to Wetland 1; this basin has since been eliminated.
- The size of the one remaining stormwater basin has been significantly reduced. The addition of pervious pavement in parking areas has reduced the amount of runoff generated by the project.
- A hydrodynamic separator has been added to the site plan to provide pretreatment of runoff before it enters the stormwater basin.

- A concentrated point discharge from the stormwater basin has been replaced with a level spreader to promote overland flow.
- The width of the undisturbed vegetated zone that will be preserved between the development and wetlands has been increased from an average of approximately 25 feet to an average of approximately 50 feet.
- It is recommended that earthwork (excavation, filling and grading) only take place between June 15-September 15 in order to avoid a seasonal high groundwater table caused by the shallow hardpan soils on the site.

As a result of these modifications, and because no direct disturbance to wetlands or watercourses is proposed, it is the professional opinion of the author that the proposed project will not impact these resources.

REFERENCES

- Ammann, A.P., Franzen, R.W. and J.L. Johnson. 1991. Method for the Evaluation of Inland Wetlands in Connecticut: A Watershed Approach. CT DEP Bull. No. 9.
- Bevier, L.R. (ed.). 1994. The Atlas of Breeding Birds of Connecticut. CT DEP Bulletin No. 113.
- Calhoun, A.J.K. and M.W. Klemens 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.
- Cowardin, L.M., V.C. Carter, F.C. Golet and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Fish and Wildlife Service FWS/OBS-79/31.
- DeGraaf, R.M. and M. Yamasaki. 2001. New England Wildlife: Habitat, Natural History, and Distribution. University Press of New England.
- DEP 2002. Connecticut Guidelines for Soil Erosion and Sediment Control. DEP Bulletin 34.
- DEC 2003. New York State Stormwater Management Design Manual. New York State Department of Environmental Conservation.
- DEP 2004. Connecticut Stormwater Quality Manual. Connecticut Department of Environmental Protection.
- Dowhan, J.J. and R.J. Craig. 1976. Rare and Endangered Species of Connecticut and Their Habitats. State Geological and Natural History Survey of Connecticut. DEP Report of Investigations No. 6.
- EPA 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. U.S. Environmental Protection Agency. 840-B-92-002.
- Golet, F.C., Calhoun, A.J.K., DeRagon, W.R., Lowry, D.J. and A.J. Gold. 1993. Ecology of Red Maple Swamps in the Glaciated Northeast: A Community Profile. U.S. Department of the Interior Fish & Wildlife Service. Biological Report No. 12.
- Horner, R.R., J.J. Skupien, E.H. Livingston and H.E. Shaver. 1994. Fundamentals of Urban Runoff Management: Technical and Institutional Issues. Terrene Institute, Washington, D.C.

- Klemens, M.W. 1993. Amphibians and Reptiles of Connecticut and Adjacent Regions. CT DEP Bulletin No. 112.
- Magee, D.W. and G.G. Hollands. 1998. A Rapid Procedure for Assessing Wetland Functional Capacity. Association of State Wetland Managers.
- Merritt, J.F. 1987. Guide to the Mammals of Pennsylvania. University of Pittsburgh Press.
- Strecker, E.W., J.M. Kersnar, E.D. Driscoll, and R.R. Horner. 1992. The Use of Wetlands for Controlling Stormwater Pollution. U.S. Environmental Protection Agency.
- Schueler, T.S. 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Metropolitan Washington Council of Governments.
- Schueler, T.S. and H.K. Holland. 2000. The Practice of Watershed Protection. Center for Watershed Protection. Ellicott City, MD.
- United States Army Corps of Engineers. 1995. The Highway Methodology Workbook Supplement. USACOE New England Division. Waltham, MA.
- Whitlock, A.L., N.M. Jarman, J.S. Larson, and P.W. Shuldiner. 1994. WEThings - Wetland Habitat Indicators for NonGame Species. The Environmental Institute. Univ. of Mass. Amherst, MA.
- Winer, R. 2000. National Pollutant Removal Performance Database. Center for Watershed Protection. Ellicott City, MD.

APPENDIX 1. VEGETATIVE INVENTORY

VEGETATIVE INVENTORY				
Scientific Name	Common Name	Indicator Status (*)	Wetland 1	Wetland 2
TREES/SAPLINGS				
<i>Acer rubrum</i>	Red maple	FAC	D	D
<i>Betula allegheniensis</i>	Yellow birch	FAC	+	
<i>Betula lenta</i>	Black birch	FACU		+
<i>Carya sp.</i>	Hickory	---	+	+
<i>Fraxinus pennsylvanica</i>	Green ash	FACW	+	
<i>Liriodendron tulipifera</i>	Tulip tree	FACU	+	+
<i>Tsuga canadensis</i>	Eastern hemlock	FACU	+	
<i>Ulmus americana</i>	American elm	FACW-	+	+
SHRUBS				
<i>Berberis thunbergii (WI)</i>	Japanese barberry	FACU	+	+
<i>Ilex verticillata</i>	Winterberry	FACW+	+	
<i>Lindera benzoin</i>	Spicebush	FACW	+	
<i>Rosa multiflora (WI)</i>	Multiflora rose	FACU	+	
HERBS				
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	FACW-	+	
<i>Cardamine impatiens</i>	Bitter cress	NI		
<i>Carex sp.</i>	Sedge	OBL	+	
<i>Decodon verticillatus</i>	Water willow	OBL		
<i>Dryopteris sp.</i>	Wood fern	FACW	+	
<i>Impatiens capensis</i>	Jewelweed	FACW	+	
<i>Juncus effusus</i>	Soft rush	FACW+	+	
<i>Toxicodendron radicans</i>	Poison ivy	FAC		+

Connecticut Ecosystems LLC

Notes: D=dominant +=present

See accompanying text for explanation of "Indicator Status" codes.

WI= "Widespread & Invasive" **RI**= "Restricted & Invasive" **PI**= "Potentially Invasive" from the publication: Mehrhoff, L.J., K.J. Metzler, and EE Corrigan. 2003. *Non-native and potentially invasive vascular plants in Connecticut*. Center for Conservation and Biodiversity, University of Connecticut, Storrs.

APPENDIX 2. WILDLIFE INVENTORY

Wildlife Inventory				
Group	Species	Wetland Dependence	General Habitat Preferences	Notes
AVIANS				
Corvidae (Jays, crows)	<i>Cyanocitta cristata</i> (232,181) (blue jay)	---	DF, MF, CF	Generalist.
Corvidae (Jays, crows)	<i>Corvus brachyrhynchos</i> (234,182) (American crow)	---	DF, MF, CF	Scavenger. Suburbs & urban open habitats.
Paridae (Chickadees, titmice)	<i>Parus atricapillus</i> (240,190) (black-capped chickadee)	---	DF, MF, CF	Cavity nester. Interior-edge species.
Paridae (Chickadees, titmice)	<i>Parus bicolor</i> ((242,191) (tufted titmouse)	FAC	DF, MF, DWS, suburbs	Interior-edge species. Cavity nester.
Sittidae (Nuthatches)	<i>Sitta carolinensis</i> (246,193) (white-breasted nuthatch)	---	DF, MF, edges	Mature trees. Cavity nester.
Cardinalinae (Cardinals, grosbeaks, buntings)	<i>Cardinalis cardinalis</i> (350,255) (northern cardinal)	---	ST	Forest edges. Requires thick brushy understory.
AMPHIBIANS				
Plethodontidae	<i>Plethodon cinereus</i> (74,33) (redback salamander)	---	DF, CF	Hide under logs, rocks, debris.
Hylidae	<i>Hyla versicolor</i> (106,40) (gray treefrog)	OBL	SS, DF, DWS, FM	Breeds in variety of aquatic sites.
Ranidae	<i>Rana sylvatica</i> (140,43) (wood frog)	OBL	VP, DWS, SS, DF, CF	Prefers thick leaf & herbaceous layer.
MAMMALS				
Sciuridae	<i>Sciurus carolinensis</i> (144,324) (gray squirrel)	FAC	DF, MF, suburbs	Mast-producing trees.

Wildlife Inventory

Introduction

The wildlife inventory was compiled by direct sightings, songs/calls, tracks, scat, and/or browse. Also included in the inventory are species that potentially breed on or use the subject property. The latter was determined by published range maps and species habitat preferences (Bevier 1994; Klemens 1993; DeGraaf and Yamasaki 2001; Merritt 1987). Species are included in the latter group based upon the experience and professional judgment of the author.

Key

References

Included next to each species name are two parenthetical numbers. These represent page numbers from the following references:

Group	1 st Reference	2 nd Reference
Avians	Bevier (1994)	DeGraaf and Yamasaki (2001)
Amphibians	Klemens (1993)	DeGraaf and Yamasaki (2001)
Reptiles	Klemens (1993)	DeGraaf and Yamasaki (2001)
Mammals	Merritt (1987)	DeGraaf and Yamasaki (2001)

Listed Species

Bolded parenthetical symbols identify listed species:

E = Endangered **T** = Threatened **SC** = Species of Special Concern

Wetland Dependence

This indicates the degree to which a species depends upon wetlands to complete its life cycle:

OBL = obligate (requires wetland habitats during one or more stages of its life cycle)

FAC = facultative (uses wetland and non-wetland habitats, and is not dependent upon wetlands to complete its life cycle)

General Habitat Preferences

These are obtained from the references listed above, and the author's experience:

Wetland Habitats	Non-Wetland Habitats
DWS=deciduous wooded swamp	DF=deciduous forest
CWS=coniferous wooded swamp	CF=conifer forest
SS=scrub-shrub swamp	MF=mixed forest
FM=freshwater marsh	ST=sapling/shrub thicket
SM=salt marsh	M=grass/forb meadow
BM=brackish marsh	
WM=wet meadow	
FE=fen	
RI=river/stream	
PO=pond/lake	
FP=floodplain	
VP=vernal pool	

APPENDIX 3. WETLAND ASSESSMENT DATA SHEETS

Introduction

The assessment of wetland functions and values in this report is based upon the “Highway Methodology Workbook Supplement” developed by the U.S. Army Corps of Engineers New England Division. This “descriptive approach” moves away from numerical or ranking methodologies, and instead relies upon professional judgment of the reviewer. It provides criteria to standardize the assessment process.

Many of these criteria appear in the data sheets that follow. Additional criteria were obtained from other assessment methodologies (Magee and Hollands 1998; Ammann et al. 1991) and the experience of the author. Responses to these criteria that are indicators of the function are listed under the “+” column. Those that detract from the function appear in the “-“ column. Excluding conditions preclude a wetland from performing a particular function. The determination of whether a particular function is identified as a “principal function” is based upon the number of positive criteria responses, and the judgment and professional experience of the evaluator.

Descriptions of Functions and Values

Groundwater Recharge

The capacity of a wetland to influence the amount of water moving from surface water to ground water (Magee and Hollands 1998).

Groundwater Discharge

The capacity of a wetland to influence the amount of water moving from ground water to surface water (Magee and Hollands 1998).

Floodflow Alteration

The storage of inflowing water from storm or flooding events, resulting in detention and retention of water on the wetland surface (Magee and Hollands 1998).

Finfish Habitat: Ponds & Lakes

Considers the quality of the aquatic habitat of a pond or lake, and its capacity to support finfish.

Finfish Habitat: Streams & Rivers

Considers the quality of the aquatic habitat of a perennial watercourse, and its capacity to support finfish.

Sediment, Pollutant & Nutrient Removal

The capacity of a wetland to remove dissolved, suspended and floatable pollutants from storm water runoff.

Production Export

The capacity of a wetland to produce wildlife food sources, or to export biomass that sustains downstream ecosystems.

Recreation

The suitability of a wetland to support various recreation activities (e.g., hiking, canoeing, boating, fishing, hunting, bird watching).

Wildlife Habitat

The capacity of a wetland to support a diverse and abundant wildlife community.

Educational/Scientific Value

The suitability of a wetland for classroom field trips, or for scientific research.

Uniqueness/Heritage

The degree to which a wetland is considered a locally or regionally unique natural resource.

Wetland Data Sheet

Project: *Tucker Drive, Torrington* Date: *9/3/13* Wetland #: */*
 Weather: _____ Time Start: _____ Stop: _____
 Recent Precipitation: Below average Average Above average

Wildlife Investigation Method(s)

Cover search Dip netting Auditory songs/calls Scat Tracks Minnow traps

Wetland Type(s) (Golet 1973 classification)

Class	Subclass			
<i>Open Water</i>	Vegetated	Non-vegetated		
<i>Deep Marsh</i>	Dead woody	Shrub	Sub-shrub	Robust
	Narrow-leaved	Broad-leaved		
<i>Shallow Marsh</i>	Robust	Narrow-leaved	Broad-leaved	Floating-leaved
<i>Seasonally Flooded Flats</i>	Emergent	Shrub		
<i>Wet Meadow</i>	Ungrazed	Grazed		
<i>Shrub Swamp</i>	Sapling	Bushy	Compact	Aquatic
<i>Wooded Swamp</i>	<u>Deciduous</u>	Evergreen		
<i>Bog</i>	Compact shrub	Bushy shrub	Wooded	Emergent

Water Regime(s)

Permanently Flooded (water covers land surface throughout year in all years)

Intermittently Exposed (surface water present throughout year except in years of extreme drought)

Semipermanently Flooded (surface water persists throughout growing season in most years)

Seasonally Flooded (surface water present for extended periods, especially early in growing season, but is absent by end of season in most years)

Seasonally Saturated (soils saturated to surface, especially early in growing season, but are unsaturated by end of season in most years; surface water absent except for ground water seepage and overland flow)

Temporarily Flooded (surface water present for brief periods during growing season, but water table usually lies well below soil surface for most of the season)

Intermittently Flooded (substrate usually exposed, but surface water is present for variable periods without detectable seasonal periodicity)

Artificially Flooded (amount/duration of flooding controlled by dikes, dams, pumps, etc.)

Hydrology

Ground water discharges present? yes no

Surface water depth: average: 0-4" maximum: _____

Soils

Drainage Class(es): Well Moderately Poorly Very Poorly

Parent Material(s): Glacial till Outwash Glaciolacustrine Alluvial Organic

Slope Nearly level Gentle Moderate Steep

Upland Review Area (URA)

Slope: Nearly level Gentle Moderate Steep

Cover Type(s): Mature forest Sapling forest Shrub thicket Meadow Mowed lawn Farm

Vegetation density: Trees Saplings: Shrubs Herbs: Grass

Leaf litter: Well-developed Moderately well-developed Absent

Cover objects: Logs Bark Boulders/Rocks

Evidence of erosion? No Yes (explain)

Wetland #: 1
 Inspection Date: 9/3/13

Project: Tucker Drive Tonnigan, CT
 Weather:

Photograph(s):
 Inspector: E.M. Pawlak

GROUNDWATER RECHARGE (Excluding Condition: Slope Wetland)

Criteria	+	-	Comments
Soils	sand/gravel outwash	hardpan, tight fine-grained soils, shallow ledge	
Wetland associated with perennial or seasonal watercourse?	yes	no	
Slope	gentle	moderate or steep	
PRINCIPAL FUNCTION? yes no			

GROUNDWATER DISCHARGE

Criteria	+	-	Comments
Soils	hardpan, shallow ledge	---	
Seeps, springs observed?	yes	no	
Wetland microrelief	well developed	none/poorly developed	
Wetland contains an outlet but no inlet?	yes	no	
PRINCIPAL FUNCTION? yes no			

FLOODFLOW ALTERATION (Excluding Condition: Slope Wetland)

Criteria	+	-	Comments
Area of wetland is relatively	large	small	
Amount of impervious surface in wetland watershed	large	small	
Wetland slope	gentle	steep	moderate
Wetland characterized by variable water level?	yes	no	
Wetland in floodplain of adjacent watercourse?	yes	no	
Valuable properties, structures or resources located in or near floodplain downstream from wetland?	yes	no	
Watershed has a history of economic loss due to flooding?	yes	no	?
Wetland outlet constricted?	yes	no	
Wetland vegetation density	high	low	
Wetland microrelief	well developed	none/poorly developed	
PRINCIPAL FUNCTION? yes no			

FINFISH HABITAT: PONDS/LAKES (Excluding Condition: Wetland not associated with a pond or lake)

Criteria	+	-	Comments
Dominant land use adjacent to waterbody	forest, shrub, meadow	lawn	
Shallow littoral zone with emergent vegetation present?	yes	no	
Waterbody at least 10' deep?	yes	no	
% of pond covered by submerged or emergent vegetation	15-40%	other	
Direct stormwater discharge via culvert?	no	yes	
Sandbar present at inlet(s)	no	yes	
Water transparency	high	low	
Significant nutrient sources (fertilizers, waterfowl) present in watershed?	no	yes	
Pond size \geq 0.5 acre?	yes	no	
Pond experiences dense algal blooms, nuisance aquatic vegetation, or duckweed?	no	yes	
PRINCIPAL FUNCTION? yes no			

Wetland #: 1

FINFISH HABITAT: STREAMS/RIVERS (Excluding Condition: Wetland not associated with perennial stream)

Criteria	+	-	Comments
Channel shaded by riparian trees and/or shrubs?	yes	no	
Gravel spawning areas present?	yes	no	
Barriers to anadromous fish (dams, high culverts) present in stream reach?	no	yes	
Dominant bottom substrate	gravel/cobbles	sand/silt	
Substrate embeddedness by sand & silt	low	high	
Instream habitat diversity (riffle, run, pool, shallow, deep)	high	low	
Channel alterations (channelization, islands or point bars)	absent or few	numerous	
Bank stability	stable	unstable, eroding	
Bank vegetative cover	high (trees, shrubs)	low	
Cover objects (fallen logs, boulders, undercut banks)	many	absent or few	
Riparian zone	wide	narrow	
Watershed development	low	high	
Water quality	good	poor	
Pollution tolerance of benthic macroinvertebrate taxa	mostly intolerant	mostly tolerant	
PRINCIPAL FUNCTION? yes no			

SEDIMENT, POLLUTANT & NUTRIENT REMOVAL

Criteria	+	-	Comments
Duration of water retention in wetland	long	short	
Wetland edge broad & intermittently aerobic?	yes	no	
Drainage ditches constructed in wetland?	no	yes	
Water flow through wetland	diffuse	channeled	
Vegetation density	high	low	
Evidence of sediment trapping in wetland?	yes	no	
Ponded water present in wetland?	yes	no	
Alluvial soils present?	yes	no	
Soil type	organic/high clay content	sand/gravel	fill
Wetland basin topographic gradient	low	high	no
Wetland microrelief	well developed	none/poorly developed	
PRINCIPAL FUNCTION? yes no			

PRODUCTION EXPORT (Excluding Condition: No outlet)

Criteria	+	-	Comments
Wildlife food sources in wetland	abundant	few	
Vegetation density	high	low	
Nutrients flushed out of wetland into watercourse?	yes	no	
Evidence of wildlife use in wetland?	yes	no	
Fish or shellfish develop/occur in wetland?	yes	no	
PRINCIPAL FUNCTION? yes no			

RECREATION

Criteria	+	-	Comments
Wetland is part of a recreation area, park, refuge, etc.	yes	no	
Fishing is available in or from the wetland	yes	no	
Hunting is permitted in wetland	yes	no	
Hiking occurs or has potential to occur in wetland	yes	no	
Wetland is a valuable wildlife habitat	yes	no	
Wetland has high visual/aesthetic quality	yes	no	
Boating or canoeing feasible in wetland	yes	no	
Off-road public parking near wetland available	yes	no	
Safety hazards (if present, list them)		✓	Locally dense multiflora rose thickets
PRINCIPAL FUNCTION? yes no			

Wetland #: 1

WILDLIFE HABITAT

Criteria	+	-	Comments
Wetland degradation by human activity	little or none	moderate to high	
Wetland fragmentation by development	little or none	moderate to high	
Buffer (F=forest M=meadow S=sapling/shrub thicket L=lawn A=agricultural)	F, L		
Buffer width		✓	
Connectivity with other wetlands		✓	
Size of landscape block in which wetland is located		✓	
Wildlife food sources in wetland	abundant	few	
Interspersion of vegetation & open water	high	low	
Upland islands	present	absent	
Wetland class diversity (WS=wooded swamp SS=shrub swamp M=marsh WM=wet meadow OW=open water)	high	low	
Vegetation density	high	low	
Vegetation strata (T=tree S=sapling SH=shrub V=vine H=herbaceous L=leaf litter)	✓		
Wetland plant species diversity	high	low	
Vernal pool?	yes	no	But at least wood frog meadow is present
Edge diversity (list types, including upland cover types)		✓	
Water regime	wetter	drier	
Habitat features (S=snags L=fallen logs SF=seep/spring)			
Cover objects (L=logs/branches R=rocks B=bark)	abundant	few	
Flat rocks in/near watercourse (stream salamanders)	present	absent	
Sphagnum hummocks next to shallow pools?	present	absent	
Bare well drained sandy soils near wetland (turtle nest site)	present	absent	
Abundance of invasive exotic flora? (give examples)	none/low	high	multiflora rose
PRINCIPAL FUNCTION? yes no			

EDUCATIONAL/SCIENTIFIC VALUE

Criteria	+	-	Comments
Wetland contains listed species	yes	no	
Wetland provides valuable wildlife habitat	yes	no	
Wetland class diversity	high	low	
Adjacent upland cover types (F=forest M=meadow S=sapling/shrub thicket A=agricultural)	high	low	
Off-road parking near wetland available	yes	no	
Proximity to schools	near	far	
Wetland contains perennial watercourse	yes	no	
Wetland contains pond/lake	yes	no	
Safety hazards (if present, list them)		✓	
Site currently used for educational/scientific purposes	yes	no	
PRINCIPAL FUNCTION? yes no			

UNIQUENESS/HERITAGE

Criteria	+	-	Comments
Wetland contains listed species	yes	no	
Wetland identified as exemplary natural community	yes	no	
Wetland locally/regionally significant (explain)			
PRINCIPAL FUNCTION? yes no			

Notes

APPENDIX 4. SOILS REPORT

Connecticut Ecosystems LLC

- Wetland Delineation • Wetland & Aquatic Evaluation • Mitigation
- Natural Resource Inventory • Permit Assistance • Expert Testimony



ON-SITE SOIL INVESTIGATION REPORT

Project Name & Location

Tucker Drive

Torrington, CT

CE Job No.: 13-9

Field Investigation Date(s): 6/21/13

Field Investigation Method(s):

Spade & Auger

Backhoe & Test Pits

Report Prepared For:

Paul B. Bailey Architect LLC

110 Audubon Street

New Haven, CT 06510

Field Conditions:

Weather: Sunny 80 °F

Recent Precipitation: above average

Soil Moisture: average

Snow Depth: ---

Frost Depth: ---

Purpose of Investigation:

- Wetland Delineation/Flagging
- Sketch Wetland Boundaries on Base Map (No Flagging)
- High Intensity Soil Mapping by Soil Scientist
- Medium Intensity Soil Mapping from SCS Soil Survey Maps

Wetland Boundary Marker Series: CE 1-1→1-5 2-1→2-25 3-1→3-30 4-1→4-2
5-1→5-14 6-1/12

Intermittent Watercourse Marker Series: ---

Wetland Notes:

- **Type(s):** deciduous wooded swamp
- **Hydroperiod(s):** seasonally saturated
- **Soil Parent Material(s):** glacial till
- **Drainage Class(es):** poorly & very poorly drained
- **Slope:** gentle

**CONNECTICUT ECOSYSTEMS LLC
ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)**

**Project Name & Location: Tucker Drive Torrington, CT
Project #: 13-9**

SOIL MAP UNITS

Soil symbols used below and on the accompanying Wetland Sketch Map correspond to those in the National Cooperative Soil Survey.

WETLAND SOIL SERIES

Ridgebury, Leicester and Whitman Complex (3)

This complex consists of poorly drained Ridgebury and Leicester soils, and very poorly drained Whitman soils, described separately below. The complex consists of about 35 percent Ridgebury soils, 30 percent Leicester soils, 20 percent Whitman soils, and 15 percent other soils.

Ridgebury Series

The Ridgebury series consists of deep, poorly and somewhat poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to moderately steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

Typically these soils have a black sandy loam surface layer 6 inches thick. The mottled subsoil from 6 to 16 inches is olive gray sandy loam. The mottled substratum from 16 to 60 inches is a light olive brown and olive, very firm and brittle gravelly sandy loam.

The seasonal high water table is within 0 to 18 inches of the surface from late fall through spring. Surface runoff is slow to medium. Permeability is moderate to moderately rapid in the surface layer and subsoil and slow or very slow in the dense substratum. A perched, fluctuating water table above the dense till saturates the solum to or near the surface for 7 to 9 months of the year.

Leicester Series

The Leicester series consists of deep, poorly drained loamy soils formed in friable glacial till on uplands. They are nearly level to gently sloping soils in drainage ways and low lying positions on till covered uplands. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

Typically, these soils have a surface layer of black fine sandy loam 6 inches thick. The subsoil from 6 to 23 inches is grayish brown, mottled fine sandy loam. The substratum from 26 to 60 inches or more is dark yellowish brown, mottled, friable, gravelly fine sandy loam.

Leicester soils are poorly drained. The seasonal high water table is within 0 to 18 inches of the surface from late fall through spring. Surface runoff is slow. Permeability is moderate or moderately rapid in the surface layer and subsoil and moderately rapid to rapid in the substratum.

**CONNECTICUT ECOSYSTEMS LLC
ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)**

**Project Name & Location: Tucker Drive Torrington, CT
Project #: 13-9**

Whitman Series

The Whitman series consists of very poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They occur in drainageways, at the base of hills and ridges, and in depressions. These soils formed in acid glacial till derived mainly from schist and gneiss. They are characterized by a dense, very firm hardpan at a depth of 22-60 inches.

UPLAND (NON-WETLAND) SOIL SERIES

Woodbridge Series (45)

The Woodbridge series consists of deep, moderately well drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to moderately steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

In tilled areas, these soils typically have a very dark grayish brown fine sandy loam surface layer 7 inches thick. The subsoil from 7 to 30 inches is dark yellowish brown and light olive brown fine sandy loam, mottled below 18 inches. The substratum from 30 to 60 inches is light olive brown, very firm and brittle gravelly fine sandy loam.

Woodbridge soils are moderately well drained. The seasonal high water table is typically within 18 to 30 inches of the surface from late fall through spring. Surface runoff is slow to rapid. Permeability is moderate in the surface layer and subsoil and slow or very slow in the dense substratum.

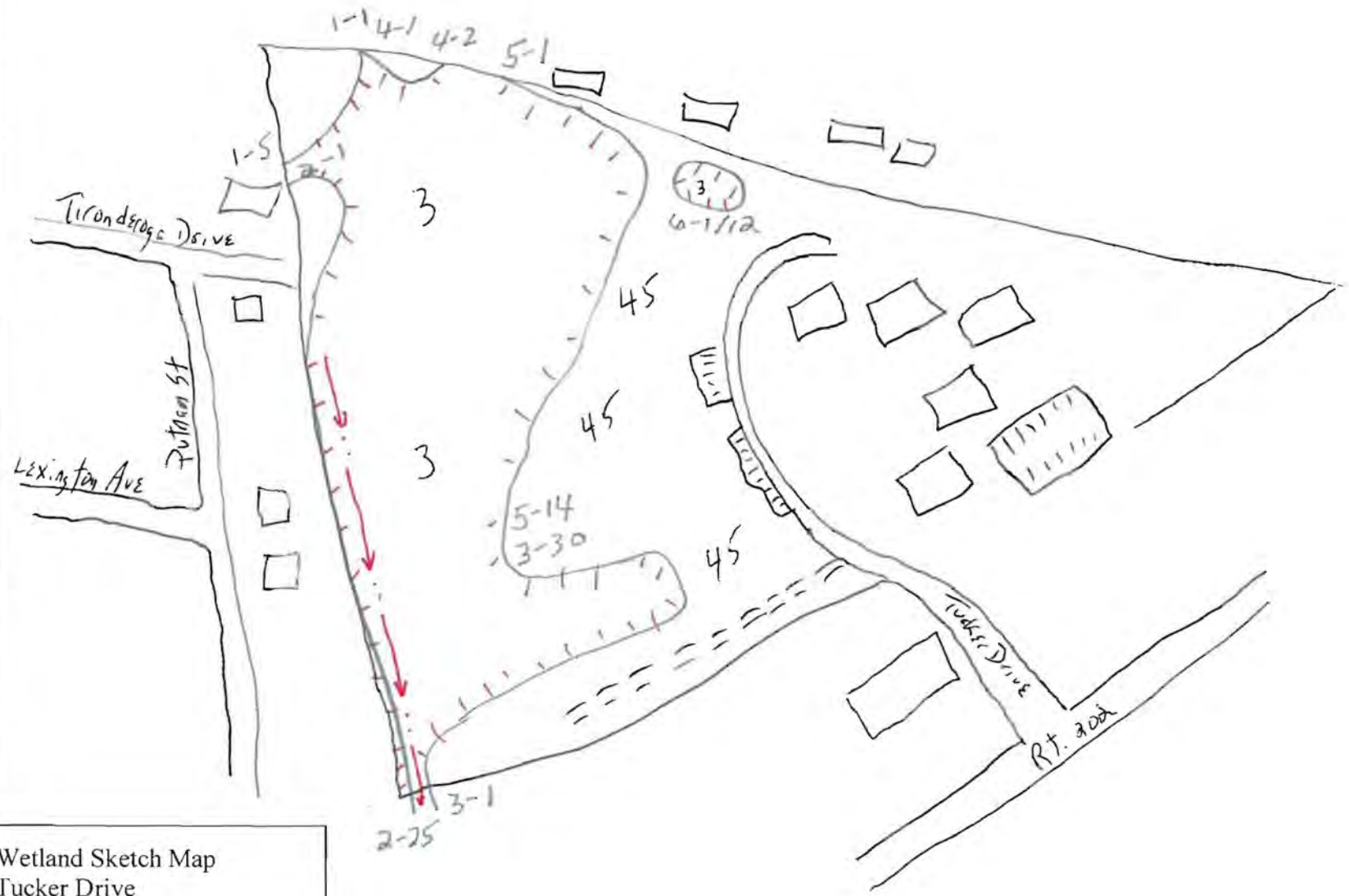
The wetlands were field delineated in accordance with the standards of the National Cooperative Soil Survey and the definition of wetlands as found in the Connecticut General Statutes, Chapter 440, Section 22A-38. The investigation was conducted and reviewed by a Registered Soil Scientist.

Respectfully submitted,

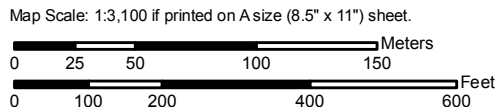
Connecticut Ecosystems LLC



Edward M. Pawlak
Registered Soil Scientist
Certified Professional Wetland Scientist
File c:\soils2013\13-9.doc




Wetland Sketch Map
Tucker Drive
Torrington
Connecticut Ecosystems LLC
June 24, 2013
Not to Scale



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

 Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:3,100 if printed on A size (8.5" × 11") sheet.

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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 10, Mar 31, 2011

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

State of Connecticut (CT600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, extremely stony	4.7	15.2%
47C	Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	12.4	40.2%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	1.4	4.4%
284B	Paxton-Urban land complex, 3 to 8 percent slopes	1.4	4.4%
306	Udorthents-Urban land complex	7.4	24.1%
307	Urban land	3.6	11.7%
Totals for Area of Interest		30.9	100.0%

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.

Wetland Delineations Ecological Studies Site Assessments Project Planning Soil Testing

July 1, 2013

ATTN: Edward M. Pawlak
Connecticut Ecosystems LLC
38 Westland Road
West Hartford, CT 06107

Re: Property on west side of Tucker Drive, Torrington, CT
SS&ES Job No. 2013-114-CT-TOR-2

Dear Mr. Pawlak:

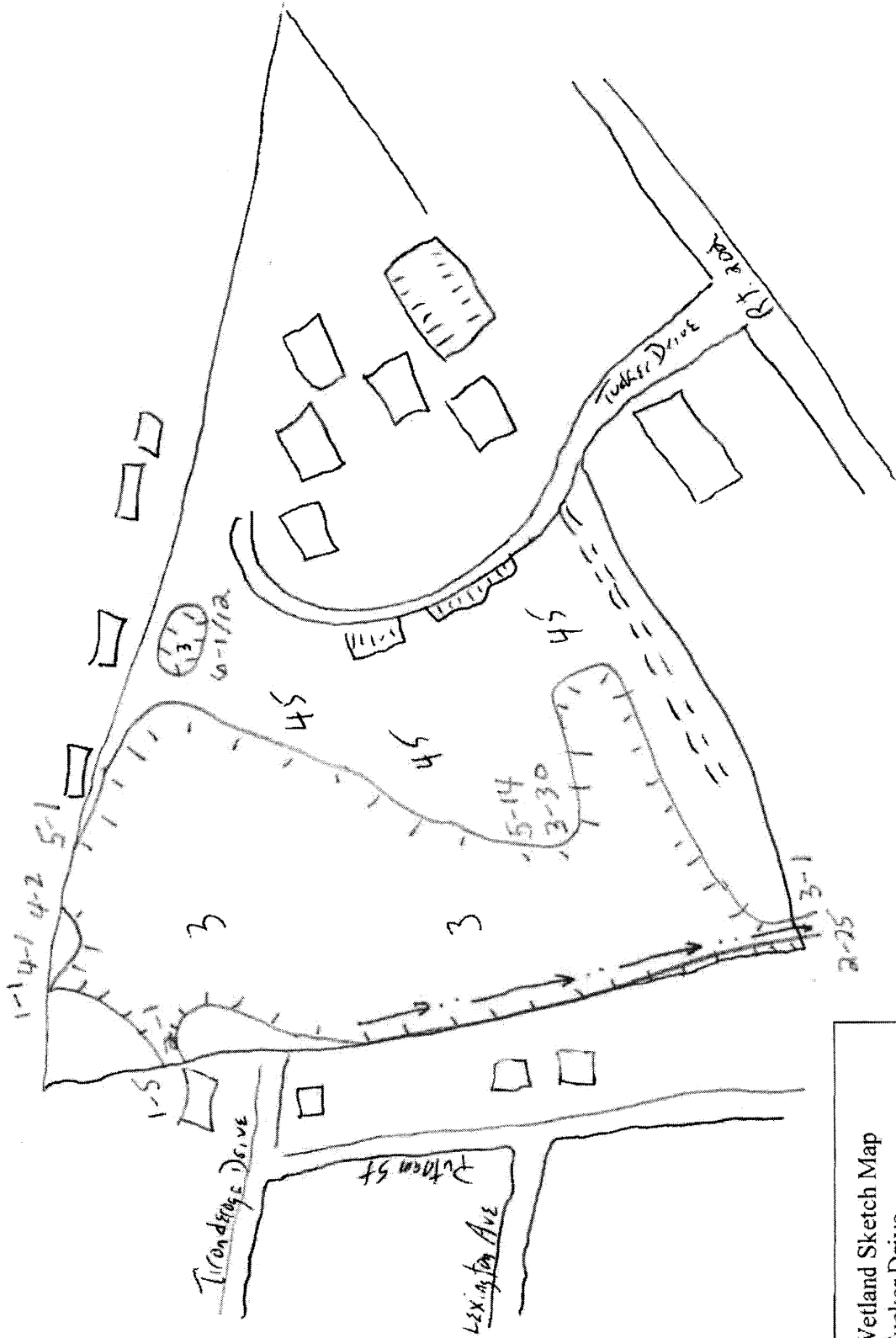
In accordance with your request, I conducted a joint site inspection with yourself on June 21, 2013. The purpose of the inspection was for wetland identification and wetland boundary delineation. Previously, you delineated the wetlands boundaries that are located in the far western and southern sides of the property (refer to Figure 1). The wetland boundaries in these areas were delineated with wetland flag numbered: 2-1 thru 2-25 and 3-1 thru 3-30.

On 6/21/2013 we examined the soils on the property that are located down slope and to the west from Tucker Drive. Jointly, we dug test holes with spades and augers, examined soil profiles in the test holes and evaluated the soils to determine whether they qualifies as wetland. Wetland soils on the property were identified as poorly drained and very poorly drained Ridgebury, Leicester and Whitman complex (3). The non-wetland soil was identified as the moderately well drained Woodbridge fine sandy loam (45). The wetland boundary that we jointly established on 6/21/2013 was delineated by wetland flags: 4-1 thru 4-2, 5-1 thru 5-14, and 6-1 thru 6-12.

Respectfully submitted,

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.


Thomas W. Pietras
Professional Wetland and Soil Scientist



Wetland Sketch Map
Tucker Drive
Torrington
Connecticut Ecosystems LLC
June 24, 2013
Not to Scale

Figure 1