



June 5, 2006

Paul Lusitani
Clough Harbour Associates, LLP
2139 Silas Deane Highway, Ste 212
Rocky Hill, CT

**RE: Wetland & Watercourse Delineation Report
12 Orchard Lane
Ledyard, Connecticut**

Dear Mr. Lusitani:

Kleinfelder completed an on-site investigation to determine the presence or absence of wetlands and/or watercourses on the above referenced property (*12 Orchard Lane, Ledyard, CT*), as requested and authorized. This investigation involved a wetland/watercourse delineation that was completed by a qualified staff soil scientist and conducted in accordance with the principles and practices noted in the United States Department of Agriculture (USDA) *Soil Survey Manual* (1993). The soil classification system of the National Cooperative Soil Survey was used in this investigation to identify the soil map units present on the project site.

INVESTIGATION

The project site was investigated on May 31, 2006, with a temperature in the high 70s under partly sunny conditions. Soil types are identified by observing soil morphology (soil texture, color, structure, etc.). To observe the morphology of the soils, numerous test pits and/or hand borings (generally to a depth of at least two feet) are completed. Wetland and watercourse boundaries were identified with flags and hung from vegetation or small wire stakes if in fields or grass communities. These flags are labeled "Wetland Delineation" and generally spaced a maximum of approximately 50 feet apart. It is important to note that flagged wetland and watercourse boundaries are subject to change until verified by local, state, or federal regulatory agencies.

The site is located within the subregional Poquetanuck Brook watershed drainage basin that flows south to the Thames River (regional basin).

REGULATORY INFORMATION

Wetlands and watercourses are regulated by both state and federal law each with different definitions and regulatory requirements. Accordingly, the State may regulate waters that fall outside of federal jurisdiction; however, where federal jurisdiction exists concurrent State jurisdiction is almost always present.

Wetland determinations are based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land. *Watercourses* are defined as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof." *Intermittent watercourse* determinations are made based on the presence of a defined

permanent channel and bank, and two of the following characteristics: (1) evidence of scour or deposits of recent alluvium or detritus, (2) the presence of standing or flowing water for a duration longer than a particular storm incident, and (3) the presence of hydrophytic vegetation. (See Inland Wetlands and Watercourses Act §22a-38 CGS.)

WETLAND AND WATERCOURSE SITE DESCRIPTION

Wetland classifications used to identify the type of wetland(s) occurring on the project site are based on guidance from the U.S. Fish and Wildlife Service (USFWS) (Cowardin et.al. 1979). These are further qualified with the Hydrogeomorphic Method of wetland classification (Brinson, 1993).

One palustrine forested and scrub-shrub seasonally saturated slope and depression wetland systems (USFWS class: PFO1/SS1E) was identified and delineated on the subject property with sequentially numbered flags 1-14 then continuing on the opposite side of a stone bridge to numbers 20 through 43. A riverine watercourse flowed through the wetland and created a distinct habitat. This wetland system contained one vernal pool with wood and green frogs present. The wetland included areas of slope and depression wetlands, which are typically when associated in the landscape with the drumlin geology. The upland soils adjacent to the wetlands consisted of Woodbridge and Charlton soils. The wetland soils consisted of poorly and very poorly drained Ridgebury complex soil. Please refer to Table 1 for the predominant vegetation within and adjacent to the wetlands.

TABLE 1: Predominate Vegetation within and adjacent to wetlands (Common (*Scientific*) names)

| |
|---|
| <p>TREES</p> <p>American elm (<i>Ulmus americana</i>) Red maple (<i>Acer rubrum</i>) Black cherry (<i>Prunus serotina</i>) Hemlock (<i>Tsuga canadensis</i>) White pine (<i>Pinus strobus</i>) Black birch (<i>Betula lenta</i>) Pin oak (<i>Quercus palustris</i>)</p> <p>SHRUBS</p> <p>Winterberry (<i>Ilex verticillata</i>) Highbush blueberry (<i>Vaccinium corymbosum</i>) Spicebush (<i>Lindera benzoin</i>) Arrowwood (<i>Viburnum dentatum</i>) Tartarian honeysuckle (<i>Lonicera tartarica</i>)* Sweet pepperbush (<i>Clethra alnifolia</i>) Japanese barberry (<i>Berberis thunbergii</i>)* Multiflora rose (<i>Rosa multiflora</i>)*</p> <p>HERBS/VINES</p> <p>Poison ivy (<i>Toxicodendron radicans</i>) Jack-in-the-pulpit (<i>Arisaema triphyllum</i>) Royal fern (<i>Osmunda regalis</i>) Cinnamon fern (<i>Osmunda cinnamomea</i>) Sensitive fern (<i>Onoclea sensibilis</i>) Northern dewberry (<i>Rubus flagellaris</i>) Jewelweed (<i>Impatiens capensis</i>) Skunk cabbage (<i>Symplocarpus foetidus</i>) Canada lily (<i>Lilium canadense</i>) *Denotes State non-native invasive species</p> |
|---|

SOIL MAP TYPES

A brief description of each soil map unit identified on the project site is presented below including information from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil descriptions. Further information on these and other soils, please refer to the internet site at <http://soils.usda.gov/technical/classification/osd/index.html>.

Upland Soils

Charlton-Chatfield (CrC, CrD), fine sandy loam

This soil type is well drained and very rocky developed in glacial till. Charlton soils have slopes of 0-50%. Permeability is moderate or moderately rapid. The slope of the CrC soil map unit is 3-15 percent and CrD is 15-45% slopes on the landscape. The soils diagnostic horizons generally include an ochric epipedon (0-4") and a cambic horizon (4"-27"). Bedrock generally occurs at depths greater than 60 inches and high ground water at depths greater and 6 feet.

Woodbridge (WxB) fine sandy loam

The Woodbridge series consists of moderately well drained loamy soils formed in subglacial till. They are very deep to bedrock and moderately deep to a densic contact. They are nearly level to moderately steep soils on till plains, hills, and drumlins. Slope ranges from 0 to 25 percent. The soils formed in acid till derived mostly from schist, gneiss, and granite. Diagnostic horizons include an ochric epipedon from 0 to 7 inches (Ap horizon), and a cambic horizon from 7 to 30 inches (Bw horizons). Aquic features (low chroma iron depletions) may occur within a 24 inch depth (Bw2 horizon).

Wetland Soils

Ridgebury Complex (Rn), fine sandy loam

The Ridgebury complex is a very deep poorly drained soil that includes poorly drained Leicester, and very poorly drained Whitman soils formed in till derived mainly from granite, gneiss and schist. Ridgebury soils on the landscape are in slightly concave areas and shallow drainageways of till uplands with slopes that range from 0-8 percent. Depth to the perched seasonal high water table from November to May, or longer, is perched above the densic materials. The soils diagnostic horizons include an ochric epipedon (0 to 5 inches (A horizon)), aeric feature 100 percent of the zone from 5 to 9 inches (Bw1 horizon), and a cambic horizon (5 to 18 inches (Bw and Bg horizons)). Densic contact root limiting material begins at 18 inches (Cd). Endosaturation occurs within the zone from 9 to 18 inches and is saturated above the densic contact (Bw2 horizon).

REFERENCES

1. Brinson, M.M. 1993. *A Hydrogeomorphic Classification for Wetlands*. Tech. Rpt. WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
2. Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. *Classification of Wetland and Deepwater Habitats of the United States*. US Government Printing Office. Washington D.C. GPO 024-010-00524-6. 103 pp.

12 Orchard Drive
Ledyard, Connecticut

Kleinfelder

June 5, 2006

CLOSING

Thank for the opportunity to work with you on this project. Please contact me at (860) 683-4200 if you have any questions or require additional assistance.

Very truly yours,

Kleinfelder



Date:
2006.06.05
13:27:50 -04'00'

Jeffrey R. Shamas, CE, SS, PWS
Environmental Planning Program Manager

Enclosures

71987

