

# Exhibit G

## Wetlands Report

WETLAND REPORT

WINDHAM SOLAR

1 WILLIAMS CROSSING DRIVE  
LEBANON, CONNECTICUT

PREPARED FOR

ECOS ENERGY

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JANUARY 2015

## **INTRODUCTION**

A photovoltaic solar energy project is proposed for a parcel of land in Lebanon, Connecticut. The property is known as 1 Williams Crossing Drive and is located just off of Route 32 in the northeastern part of Lebanon. The property contains a mix of active farm land as well recently cleared woodlands that are in varying stages of regrowth. Cold Brook, a perennial water course is the main wetland resource on the property. In addition to Cold Brook and its associated wetlands, three isolated wetland areas were also mapped on, and just off the property. It should be noted that the property includes land in Franklin, CT. However, no site work is proposed in the Town of Franklin and the project will be referred to as being in Lebanon, CT.

The inland wetland boundaries on the above-referenced property were field delineated on October 13, 2014. 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 prepared plans have been reviewed and the representation of the field delineated wetlands is substantially correct.

## **EXISTING CONDITIONS**

The property is located on the southwestern side of Williams Crossing Drive just westerly of its intersection with Route 32. The property contains an existing house, garage, and associated improvements. A large chicken coop is located on the property just north and west of the existing house.

### **Upland Resources**

The property contains existing tilled farm fields that have been used for the production of silage corn. The fields are located in the northern third of the property in the area of the existing house and coop. The remainder of the property was wooded with mainly mixed hardwood species. The wooded areas were clear-cut over the last five or so years and the vegetation in the former wooded areas is in varying stages of regrowth.

The regrowth consists mainly of stump sprouts of the tree and shrub species that formerly colonized the site. The vast majority of the vegetation on the site is classified as successional field growth. Large areas of the uplands have been colonized with brambles of Blackberries interspersed with Goldenrod and other annual agricultural weed species. A few tree species remain on the property but were limited to areas along the property lines and small patches scattered throughout the site.

The soils on the property can be divided into two very broad categories. The eastern third of the property contains soils underlain by sand and gravel while the western two-thirds of the property contains soil that developed from a glacial till.

The glacial till on the site tends to be a sandy friable till associated with the well drained soils of the Canton and Charlton Series. This is in stark contrast to the basal till (hardpan) that tends to dominate the upland soils in other areas of the town. Having the soils develop from a sandy till, the upper part of the soil profile contains permeable soils and lacks the perched water table normally associated with soils that develop in glacial till.

In the eastern third of the property the soils developed from deposits of stratified drift (sand and gravel) and the surface soils are dominated by sandy textures and tend to be free of stones in the upper part of the soil profile. The soils have good internal drainage and the seasonally high water table is two to three feet below the soil surface. The soils underlain by sand and gravel are also located on the flatter areas of the property easterly of the well-defined slope break. The soils in this area of the uplands are dominated by moderately well drained soils of the Sudbury Series.

### **Wetland Resources**

The main wetland resource on the site is Cold Brook and its associated wetland soils. In addition to the Cold Brook wetlands two other isolated wetlands were identified on the Lebanon portion of the site.

Cold Brook is a perennial water course that enters the site in the southwestern corner. The Brook and its wetlands then leave the boundaries of the site only to re-enter a few hundred feet to the east. As with the remaining wooded areas of the site, the vegetation along Cold Brook was clear-cut in the recent past and the vegetation consists of mainly herbaceous species with some shrubs beginning to colonize the cleared areas.

The upper parts of the Cold Brook wetlands are well defined by a sharp topographic break at the toe of a short but moderately steep slope. The Brook enters the site from a wooded area along the western boundary and flows into a broad flat wet meadow type wetland. The stream flow is diffuse through this area of the wetland but becomes a bit more defined just as it exits the property. This former Red maple/Grey birch dominated wetland is now dominated by herbaceous species that include, but are not limited to: Woolgrass, Soft rush, Cat-tails, Goldenrod, Asters and other annual weed species. In uncut areas adjacent to the property lines Multiflora rose and brambles of Blackberry dominate the vegetative cover. Just as the wetland exits the property the wetland system begins to narrow as the stream leaves the area of glacial till and enters the area underlain by sand and gravel.

The wetland system re-enters the property. At this point the topography within the wetland lessens and the wetland system narrows. Cold Brook becomes more defined at this point and there is a well defined channel with banks associated with the Brook. The vegetation in this portion of the wetland system does not deviate from what was found further upstream. Seepage zones along the edges of the wetland are not as pronounced indicating that the lower part of the wetland system has ground water recharge functions. The Brook channel does not increase significantly in size lower in the property which is another indicator of ground water recharge.

The second area of wetlands occurs along the western property line just south of an existing corn field. This wetland area is man-made and appears to have been created as an extension of swale along the western limits of the corn field. As the swale exits the corn field a two to three foot cut was made along the property line. The upland portion of the swale contributes surface water and, to a limited degree, ground water to the mapped wetland. However, the cut along the property line captures ground water exfiltration or seepage in the wet periods of the year. Beyond the corn field the elongated man-made swale was identified as a regulated seasonal water course. The area is clearly identified as a man-made feature by the castings of soil on either side of the swale.

The swale contains a preponderance of hydrophytic vegetation (wetland species) that include Woolgrass and Soft rush with some Cat-tails just beginning to colonize the area. Eventually the swale and its defined water course channel dissipate and the surface water seeps into the ground.

Along the sides of the channel the vegetation has had more time to establish and contains mainly shrub species and brambles.

The third and final on-site wetland occurs in the southeastern part of the site but northerly of Cold Brook. This isolated wetland has its origins as a small hillside seep along the interface of the glacial till and stratified drift. This resource is within an area that was recently cleared and the re-growth is mainly annual weed species that are dominated by Goldenrod. However, a slight increase in Woolgrass, Soft rush and Sensitive fern are the only outward indicators that this is a regulated wetland. There is no surface water associated with this resource, and most of the soil indicators that indicate this is a regulated wetland were found at the bottom limits of the recorded soil profile. Even to the trained eye this area does not have the typical appearance that would indicate a wetland.

## **WETLAND FUNCTIONS**

The Functions and Values assessment is for the Cold Brook Wetland System. The two isolated wetland systems have minimal potential for the listed functions and values and were not included in this portion of the report. A brief explanation of the functions and values of the two isolated wetlands will be given at the end of this section.

The functions and values of the wetlands will be described in a qualitative manner modeled after the method used by the US Army Corps of Engineers. The information is from *The Highway Methodology Workbook Supplement*. This publication uses a descriptive approach to assessing functional values, versus the CT D.E.E.P. approach, which uses a quantitative or numerical approach to ranking wetland functions and values.

Ground Water Recharge/Discharge - This function considers the potential for a wetland to serve as a ground water recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

The wetland has both discharge and recharge functions. The upper third of the on-site wetland has ground water discharge indicators. Numerous seepage zones were noted along the edges of the wetland. The bottom of the wetland system flows through sand and gravel. In this area seepage zones were not present and stream flows were visibly lower than higher in the watershed. No evidence of over the bank flows was noted along the length of the channel.

Floodflow Alteration - This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of flood waters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

No areas of natural detention were noted. There is a constant gradient within the wetlands and no signs of ponding were present. This is not a primary function of the Cold Brook wetland system.

Fish and Shellfish Habitat - This function considers the effectiveness of seasonal or permanent watercourses associated with wetland in question for fish and shellfish habitat.

Although Cold Brook is listed as a perennial stream, the site is located in the upper reaches of the watershed and the water course is not well developed. In the summer, flows can be non-persistent and the presence of sand and gravel in the lower portion of the property indicate the on-site portion of the Brook is not a habitat for cold water fisheries. As the Brook crosses the railroad tracks the cross

culverts are positioned too high to allow for fish passage. This is not a primary function of the wetlands.

Sediment/Toxicant/Pathogen Retention - This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens in runoff water from surrounding uplands, or upstream eroding wetland areas.

The upper portion of the wetland with its wide area and diffuse surface flows do provide potential for this function. The lower part of the wetland has less potential due to the narrowness for the water course and lack of over-bank flows. The watershed above the property is mostly undeveloped and there are few sources of sediment/toxicants/pathogens in the watershed above the site. This is a primary function of the wetlands.

Nutrient Removal/Retention/Transformation - This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands, and the ability of the wetlands to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.

As with the previous function the upper part of the Cold Brook system has potential for this function. The lower part of the resources has less potential due to the presence of a defined water course. Overall, this is a primary function of the wetlands.

Production Export - This function relates to the effectiveness of the wetland to produce food or usable products for human, or other living organisms.

Organic matter production does occur in the wetlands, however, export is limited. This is not a primary function of the wetland.

Sediment/Shoreline Stabilization - This function evaluates the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.

The wetland soils associated with Cold Brook provide buffering capacity for the Brook. This is a primary function.

Wildlife Habitat - This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and wetland edge. Both resident and/or migrating species are considered.

Wildlife utilization of the property has changed because of clear-cutting, which has spurred regrowth and provides habitat for birds and small mammals. The lack of diversity in wetland types and cover classes limits the effectiveness for this function. The lack of permanent open water in the form of deep water or shallow water marshes is also a limiting factor. Although utilization of the site occurs, based on this specific methodology the on-site wetlands are not primary wildlife habitat wetlands.

Recreation – (Consumptive and Non-Consumptive) This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities.

The site is suitable for passive recreation; however, water based recreation is not suitable on this site. The site has limited potential for this value.

Educational/Scientific Value - This function considers the suitability of the wetland as an “outdoor classroom” or for scientific research.

The site has been utilized for agriculture and shows the typical indicators. The recent clear-cutting has lowered the potential for this value. The site has limited resources for this value. This is not a primary value for the wetlands.

Uniqueness/Heritage - This value considers the effectiveness of the wetland for special values such as archeological sites, rare and endangered species habitat or uniqueness for its location.

The site is fairly typical for the area. Some of the site is tilled for agriculture and the remainder contains altered vegetation with no unique habitat or other unique natural resources.

Visual Qualities/Aesthetics - This value relates to the visual qualities of the wetlands.

The visual aspects of the wetlands have been completely altered by a clear cut. Other than slight variations in individual species the wetlands are not that different from the uplands.

Endangered Species Habitat – This value considers the suitability of the wetland to support threatened or endangered species.

There are no listings for this property or the immediate area, based on a review of the Natural Diversity Data Base maintained by the State of Connecticut Department Of Energy and Environmental Protection.

## **SUMMARY AND RECOMMENDATIONS**

In summary, the Cold Brook wetland system is a ground water recharge and discharge system. The wetlands do function in the realm of water quality but have no potential for flood control or alteration of flood flows. The wetlands are typical for the area and are not known to be habitat for rare or endangered species.

The isolated man-made wetland appears to have been created as an extension of a ground water control swale adjacent to the upper corn field. The swale has a flat gradient and no erasable velocities were noted. This man-made feature is a ground water discharge wetland created in glacial till. Other than the ability to capture sediment in runoff from the corn field it has no other discernable wetland function.

The other isolated wetland is a natural feature that exhibits a mainly mesic or upland composition of vegetation. There is no surface water associated with the wetland, and other than a few wetland indicator species, the area does not have the outward appearance of a wetland.

With the minimal functionality of the two isolated wetlands, and considering the proposed activity associated with the site development, it is my professional opinion that the 100-foot upland review areas for these two wetlands are not necessary to protect the resource. A minimal set-back to allow for construction and maintenance of the solar panels is all that is required for these resources.

A 100-foot set-back from the upper part of the Cold Brook wetlands would preserve the slope leading down to the wetlands and would help to restore some of the natural buffer along the Brook. The lower part of the Cold Brook wetland system has gentle slopes and less habitat potential. A reduction in the upland review area could be accomplished without compromising the integrity of the resource.