



**Town of Carlisle**  
*Office of*  
**CONSERVATION COMMISSION**  
66 Westford Street  
Carlisle, Massachusetts 01741

Tel. (978) 369-0336  
Fax: (978) 369-4521

# MEMO

**TO:** Carlisle Zoning Board of Appeals,  
Travis M. Snell, Chair

**FROM:** Carlisle Conservation Commission, Sylvia Willard, Administrator

**CC:** Town Administrator, Board of Health, Planning Board

**DATE:** July 28, 2016, REVISED August 25, 2016 (see page 3)

**RE:** Plan P, "The Birches," 100 Long Ridge Road, February 2, 2016,  
Prepared for: Lifetime Green Homes, LLC.

The Carlisle Conservation Commission is in receipt of Plan P, dated February 2, 2016 provided by ZBA along with a request for Commission comments prior to August 8, 2016. The Conservation Commission has jurisdiction over all work that will alter the area within the 100-foot Buffer Zone of the Bordering Vegetated Wetland and within the Bordering Vegetated Wetland itself.

The plan as received is not an appropriate plan for submission to the Carlisle Conservation Commission under the Wetlands Protection Act and the Carlisle Wetlands Protection Bylaw. It fails to provide adequate information regarding direct impacts to the Bordering Vegetated Wetland Resource Area (BVW), any proposed mitigation of those impacts, the limit of work, tree removal, grading, and information pertinent to the redesigned stormwater management system. Although an Order of Conditions was issued on a previously submitted plan for this property, the Plan P has such significant changes that a new Notice of Intent will be required.

The most significant immediately observable change proposed in Plan P from the previously approved plan is the installation of seven (7) public water supply wells and their individual access roadways. All the wells are accessed via what appear to be unpaved ways with four via a wetland crossing with a direct alteration of the Bordering Vegetated Wetland. The BVW on this site is the upper reach of an intermittent stream. The distance from the BVW to the wells as shown appears to range from 5 feet to 35 feet, with four wells located less than 20 feet from the BVW.

The Conservation Commission has serious concerns regarding installation of so many public water supply wells sited so closely to the Bordering Vegetated Wetland. This stream flows downhill leveling out more widely as a forested wetland on the subject property and close to a Certified Vernal Pool. The vernal pool likely shares groundwater with the Bordering Vegetated Wetland.

It is well established that inland wetlands receive water from multiple sources including precipitation, surface-water inflow and ground-water discharge (or outflow). Wetlands lose water to evapotranspiration, ground-water recharge (or inflow), and surface water outflow. Some water remains as



storage in the water table. The degree to which each of these factors contribute to an individual wetland's water budget depends upon site conditions, climate and "human-induced hydrologic alterations"\*.

The Conservation Commission regularly issues permits for private water supply wells in the 100-foot Buffer Zone and understands that the impact to the BVW from groundwater withdrawal will exist but will likely be minimal because the well is for one single family home use and homes in Carlisle are generally widely spread apart.

The Commission is concerned that the reduction in groundwater discharge to the BVW resulting from water supply withdrawal for 20 single family homes, a "human-induced hydrologic" alteration, could alter the water budget for this wetland resulting in dehydrating the stream, starving the downstream BVW and its neighboring Certified Vernal Pool during critical times of year. The Wetlands Protection Act is Massachusetts state law and requires that wetland resource area alterations be avoided, minimized or mitigated. There can be no net loss of Bordering Vegetated Wetlands.

As shown on Plan P, installation of the public water supply wells appears to have had a domino effect on the details of the Commission's previously permitted plan for this property. These changes should be extensively itemized and explained by the applicant. The current plan provides minimal details, but the following can be noted:

- All four houses previously shown in the 100-foot Buffer Zone have been relocated, with one completely and one partially still located within the Buffer Zone.
- The redesigned Stormwater Management has provided for all roadway runoff directed to two stormwater basins located, one completely within and one partially within, the 100-foot BZ. Previously nearly all the stormwater management and treatment was located outside the BZ.
- No underground roof runoff Cul-Tech infiltration systems are shown for the homes.
- No propane tanks associated with the houses are shown for the homes.
- No conduits leading from the water supply wells to what may be the pump house are shown
- No project phasing, Phase I and Phase II is shown.
- Plan P has no legend
- Some abutters have changed
- Lot 5 now has a home, septic system and well located on it
- No bedroom number to be supported by the water supply wells is provided

**Recommendations:**

1. In order to determine the impact on the BVW by the withdrawal of water for 20 homes, the Carlisle Conservation Commission recommends that the Zoning Board of Appeals require special hydrologic studies be undertaken.
2. Determine the number of bedrooms being supplied by the water supply
3. Continue the contract with NOBIS Engineering in order to conduct these further hydrologic studies, including a Mass Balance Analysis, to determine the impact on the Bordering Vegetated Wetlands of water withdrawal from the proposed 7 water supply wells for 20 single family homes of unknown bedroom count.
4. Require the applicant to submit a plan with more information, including, but not limited to roadway dimensions and elevations, the well access ways dimensions, elevations, grading and associated clearing, conduits, a legend as well as a letter detailing the changes made to the previously approved plan and why.

5. Determine the effect on the project design should one or more of the planned water supply wells fail to provide adequate water.
6. Determine through Peer Review of whether the Stormwater Management System is adequately designed and will protect the nearby Bordering Vegetated Wetland during significant storm events.

***6A. There is no evidence that the locations shown for the stormwater management features identified as the Bio-Retention Basin and the Detention Basin have been subject to soil testing to ensure that they are designed to function adequately. These areas are new locations for stormwater management. One is fully and one is partially within the 100-foot Buffer Zone of a Bordering Vegetated Wetland as shown on Plan P and its 8.18.2016 revision. The Conservation Commission highly recommends that these areas be subject to soil testing prior to engineering peer review.***

***6B. The Stormwater Management Report Vol. 2, pages 16 & 63 identifies areas in square feet used in the Stormwater management computations. These figures should be confirmed as they appear to be incomplete. In addition, the Index lists Bennett Orchard (in Littleton, MA) as the site.***

7. Determine whether seven public water supply wells on site are necessary, whether there can be fewer, and whether wells can be sited further from the Bordering Vegetated Wetland in order to reduce the direct impacts to wetlands likely to occur from the well installation process, the well testing process and the potential for reduction of groundwater discharge that could permanently alter the BVW both near the wells and further downstream.
8. Determine whether the proximity of the stormwater basin which provides storage and infiltration for runoff, including first flush from roadways, lawns and roofs could affect the water quality of the nearby water supply wells over time.
9. Determine how vehicular service to the water supply wells will be provided during all seasons.
10. Determine how is snow will be managed.

If you have any question please call the Carlisle Conservation Commission office at: (978) 369-0336

\*<https://water.usgs.gov/nwsum/WSP2425/hydrology.html>