

MEMORANDUM

TO: Sarah Mellish, Chair, Manchester ZBA **cc:** Greg Federspiel
Becky Jaques

FROM: Steve Gang, Chair, Conservation Commission

DATE: July 11, 2022

SUBJECT: Vernal Pools – Specific Standards for Assessing Impact

Thank you for requesting advice on the specific performance standards to apply in assessing potential impact on the vernal pools in and around Shingle Place Hill, in order to decide about the waivers requested by the 40B Applicant from our local Wetlands Bylaw. I've read the black-letter law and regulations, looked up precedents and consulted VP experts on these performance standards, both in 40B applications to ZBA and ordinary Conservation Commission reviews. What follows is my synthesis of that research and any mistakes are my responsibility.

BACKGROUND

As you already know, Vernal Pools are protected to some extent under the State Wetlands Protection Act and to a greater extent under the Manchester Wetlands Bylaw. In both cases, the primary value of VP is breeding habitat for amphibians who live upland from the VP.

- WPA protects Certified VP as habitat up to 100 feet beyond the pool boundary, provided that habitat is within another wetland resource protected by WPA. It prevents alterations which would result in impairment of the wildlife habitat function of the CVP.
- Our local Bylaw designates VP as a “wetland resource” (not merely “habitat”), includes identified/potential VP as well as CVP, and defines that resource as extending 100 feet from the banks of the VP. In addition, our local buffer zones apply beyond the 100' resource boundary – an additional 25' of “No Disturb Zone,” out to 50' of “No Build Zone,” and out to 100' of Buffer Zone. This means that work within 200' of a VP is presumed to have a harmful impact on the VP and it's the Applicant's responsibility to prove otherwise.

Under the local Bylaw, the proposed construction on Shingle Place Hill would take place in the buffer zones to VP, both Certified and Identified-But-Not-Certified. The Applicant would be required to demonstrate the absence of harmful impact on the affected VP, which are to the north and west just off the property, to the east in the center of the property. (The large CVP at the southern end of the property would not be directly impacted, unless the onsite septic plan is revived.)

Under the WPA, habitat around the CVP within the Riverfront and the bordering vegetative wetland in/near Sawmill Brook to the north of the property would be within jurisdiction. A detailed wildlife habitat evaluation is required showing no adverse effect on VP habitat, which the Applicant has proffered. According to MassDEP's definitive manual on Wildlife Habitat Protection, "a finding that impacts to VP habitat will not result in an adverse effect will only occur under rare and unusual circumstances. ... avoidance of impacts to VP habitat is almost always necessary to meet performance standards."

PERFORMANCE STANDARDS FOR VP

With that as background, ZBA will need to apply specific performance standards in considering whether to grant waivers from local Wetlands Bylaw, or to impose conditions to protect VP and associated wildlife habitat, or to deny because harmful impacts are unavoidable. (Unless ZBA denies for lack of needed information requested from the Applicant.)

Importantly, ZBA should bear in mind that two of the CVP to be protected are on Town-owned land dedicated to conservation purposes and within a much larger Town-owned properties similarly dedicated in perpetuity. Considering these specific "local needs," the ZBA should exercise the highest level of care and use the most protective appropriate standards in judging impact to those CVP.

Neither the WPA nor the local Wetlands Bylaw provide very specific performance standards, such as quantitative metrics for loss of upland habitat or VP characteristics such as temperature, pH, turbidity, and others. Therefore, ZBA must look to other Regulations and precedents protecting VP and their habitats.

The most pertinent regulations for ZBA are found in the **Mass Surface Water Quality Standards** (SWQS, 314 CMR 15.00).

1. CVP are classified as Outstanding Resource Waters (ORW)(4.06(1)(d)(12), for which no new or increased discharge of pollutants is allowed, including solid fill or storm water. (Generally, a CVP will be protected from the discharge of fill as an ORW, even if the CVP is not subject to WPA jurisdiction as a state wetland.)
2. ZBA could utilize the quantified standards from SWQS for Class A waters, which are those "designated as a source of public water supply and their tributaries" (should include Sawmill Brook as providing recharge to our Lincoln Street Well). (4.05(3)(a)) These standards set minimum criteria as follows:

- a. Dissolved Oxygen not < 6.0 mg/l in cold water fisheries and not less than natural background conditions (if lower)
 - b. Temperature not > 68 F based on "the mean of the daily maximum temperature over a seven day period in cold water fisheries" + "the rise in temperature due to a discharge shall not exceed 1.5 degrees F" [Sawmill Brook is designated a Cold Water Fishery]
 - c. pH between 6.5 - 8.3 but not more than 0.5 units outside of the natural background range - "there shall be no change from natural background conditions that would impair any use assigned to this Class."
 - d. Solids - "free from floating, suspended and settleable solids in concentration or combinations that would impair any use assigned to this class, that would cause aesthetically objectionable conditions, or that would impair the benthic biota or degrade the chemical composition of the bottom."
 - e. Color & Turbidity - free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to this Class."
 - f. Oil & Grease - free from oil and grease, petrochemicals and other volatile or synthetic organic pollutants."
 - g. Taste & Odor - none other than of natural origin
3. Alternatively, ZBA could use the quantified standards from SWQS for Class B waters, which are those "designated as a habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical function, and for primary and secondary contact recreation." Class B minimum criteria are:
 - a. Dissolved Oxygen – same as Class A waters
 - b. Temperature - same, except "the rise in temperature due to a discharge shall not exceed 3.0 degrees F"
 - c. pH - same as Class A waters
 - d. Solids - same
 - e. Color & Turbidity - same
 - f. Oil & Grease – "free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life."
 - g. Taste & Odor – "none in such concentrations or combinations that are aesthetically objectionable, that would impair any use assigned to this Class, or that would cause tainting or undesirable flavors in the edible portions of aquatic life."

Second, ZBA can also look to **Mass 401 Water Quality Certification** (314 CMR 9.00) which apply to the discharge of any fill material in waters which are subject to state water quality certification under 33 USC 1251. No exemptions are available for discharge to any ORW which includes CVP, for which “no discharge of dredged or fill material shall be permitted.” Thus, zero discharge from runoff or stormwater management is the standard under these Regulations.

Third, ZBA could look to the **Mass Forest Cutting Practices Act** (304 CMR 11.00) which protects CVP from certain forestry impacts. These apply to the proposed project due to the amount of tree removal (>50 cords or 25 MBF) while “changing land use when permitted by town or city.” Regulations here require an Applicant to:

- Submit a Forest Cutting Plan to MassDCR for review by a Service Forester
- Protect water quality of all water bodies and CVP with filter strips of at least 50 feet width, which may be increased to 100’ if the slope is greater than 30%.
- Protect the visual quality of the landscape with a buffer strip of 50 feet along edge of all publicly maintained ways, in which at least 50% of the tree density (basal area) shall remain uncut

In terms of precedents, the importance of **using water budgets to estimate impact on VP and habitat** has been established in an OADR adjudicatory decision “In The Matter Of Bosworth” (OADR Docket #WET-2015-015, Recommended Final Decision February 17, 2016, adopted by Final Decision March 14, 2016):

- “Vernal pool habitat is sensitive to changes in water, light, and chemical influences. Generally, in order for vernal pool habitat to continue to function and co-exist with nearby development its water budget must be sustained post-development. If surface runoff is redirected or groundwater recharge in proximity to the vernal pool is reduced by impervious surfaces, then the vernal pool water budget could be adversely impacted, potentially resulting in adverse impacts to the vernal pool habitat. Land use changes, such as clearing, increases in impervious surfaces, and changes in the watershed can increase or decrease water runoff, which could alter the amount of water received by a vernal pool, destroying the water budget that is necessary to sustain the habitat of that pool. Vernal pools with a significantly disturbed watershed generally have a higher pH, more mineral substrate, and more algae, which negatively impacts the habitat.... This susceptibility to changes in light, chemicals, or water is why **in similar cases project applicants have performed detailed assessments to determine how work in the buffer zone will impact the vernal pool habitat, particularly its water budget.**”

Finally, The ZBA should consider the **reduction in wildlife habitat** beyond the 100 foot maximum under the WPA (or the 200 foot jurisdiction of local Bylaw). VP experts recommend using a 750 foot “ecological habitat or life zone” (Morgan and Calhoun, University of Maine, 2012). Any significant reduction in wildlife habitat would be evidence of impairment of the VP functions. This consideration should be in addition to any evaluation of reduction in watershed for the specific VP on or near the project site.

POSSIBLE APPLICATION OF THESE PERFORMANCE STANDARDS TO THIS PROJECT

Absent onsite sewage treatment, ZBA should focus on storm runoff, stormwater management and handling of snow removal, in applying these performance standards. In addition to what you have already required from the Applicant, I’d recommend that ZBA:

1. Require a professional estimate of the amount of salt and other de-icing chemicals that will be used in a typical winter to keep the driveway and sidewalk safe, as well as proof that salt or other chemicals will not contaminate the CVP, BVW or Sawmill Brook within the meaning of these performance standards. (N.B., salt is not removed by most stormwater BMPs.)
2. Require a professional estimate of the amount of contaminants potentially reaching the CVP, BVW and Sawmill Brook from cars and trucks using the driveway, as well as proof that there will be “no new or increased discharge of pollutant ... including solid fill or stormwater” to the CVP, as per the Mass Surface Water Quality Standards cited above. Contaminants to be estimated and analyzed (and which are also not removed by stormwater BMPs) should include:
 - Volatiles and oils leaking from vehicles,
 - Benzenes and polyaromatic hydrocarbons from exhaust,
 - Metals such as lead and copper from vehicle tires,
 - PFAS from brake linings.

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Please direct any questions or comments to the author.