

March 25, 2005 comments to DEP on Middlesex's proposed amendments

Attached are excellent comments by Mark Roberts, the attorney for petitioners (i.e., the objecting citizens) to the state Department of Environmental Protection on Middlesex School's proposed amendments to the wetlands permit that allows it development access to the Estabrook Woods. Included with the letter (but not below) are the fine comments of March 24, 2004, by Dr. William W. Walker, Jr. These have been previously circulated and are also available at <<http://www.wwwalker.net/estabrookwoods>>.

The proposed amendment reflects changes shown in plans that were circulated in November 2004. These proposed changes include doubling the number of tennis courts, reducing construction in the buffer zone, pushing the soccer fields deeper into the Woods and surfacing them with artificial "grass," and narrowing the width of the bridge by 23%. The public comment period ended March 26, 2005. These comments by Mark Roberts, Esq. follow:

March 25, 2005

Department of Environmental Protection...
...Boston, Massachusetts 02108

Re: Proposed Amendment to Final Order of Conditions
Middlesex School, DEP File No. 137-403

Dear Sir/Madam:

On behalf of [petitioners], we hereby submit the following comments in opposition to the of the Proposed Amendment to the Final Order of Conditions issued to Middlesex School in DEP File No. 137-403. While the Petitioners welcome efforts to reduce the impacts of the proposed project to the surrounding bordering vegetated wetland ("BVW") and rare and endangered species habitat, a close review of the proposed Amendment and supporting documents demonstrates that the project proposed the project will have a substantial and adverse impact on wetland resources contrary to the Wetlands Protection Act, M.G.L. c.131, §40 ("WPA") and will have a substantial and adverse impact on rare and endangered species habitat contrary to the WPA and the Endangered Species Act.

As described in the attached Comments prepared by William W. Walker, Ph.D., the drainage system design and the attendant drainage calculations are incomplete and can not serve as the basis for stating that this project will not adversely impact the BVW and rare and endangered species habitat, by diversion of water, flooding and/or erosion. Additionally, the artificial turf will reduce the evapotranspiration rate leading to increased levels of drainage and discharge that are not addressed in the Application. The application ignores the increased export of nutrients and metals caused by the use of artificial turf, as well as the increased acidity and potential for a change in the inorganic composition of site drainage as a result of the artificial turf on the soccer fields.

Specifically, the Petitioners assert the following:

- 1) The Application fails to present a complete analysis of the drainage system design or drainage calculations for the project proposed. Instead calculations from past plans are cobbled together with a piecemeal analysis of the current plan making any analysis of either the system design or the drainage calculations impossible.
- 2) The elaborate discussion of the infiltration basin used to off-set the impacts of the new tennis courts neglects to consider or explain how it will work in the surrounding geology which is described as soils that have “hardpan” layers with “moderately slow” to “very slow” infiltration rates. These conditions will likely lead to static water being present in the infiltration basin and overflows into the down gradient detention ponds. This issue was not addressed in the drainage calculations presented.
- 3) The application provides no justification for the drainage system designed under the soccer fields or the assumption that the system would always be empty at the beginning of every storm. As a consequence of ground water interception or residual standing water from antecedent storms, the system could be saturated at the beginning of any given storm. Therefore, the Applicant should either provide the calculations and site specific data used to support the assumption that the drainage system would be empty even after back to back storms, or provide truly conservative drainage calculations assuming that the soccer fields are impervious. These calculations need to be included in the drainage calculations for the project as there can be no question that snow, ice and frost will render the soccer fields during winter and spring rains truly impervious so this condition absolutely will occur at certain times of the year.
- 4) Removal of the forest and the loss of depression storage resulting from changes in topography with the installation of level soccer fields and tennis courts has not been taken into account anywhere in the drainage calculations presented. The loss of this storage resource must be calculated to accurately design a drainage system that will be protective of the BVW and rare and endangered species habitat.
- 5) There is a high probability that the cuts in the forest of up to 15 feet will intersect the seasonal perched water table (page 2) as well as the ground water table. The flow of ground water into the drainage system for the soccer fields has not been quantified, making it impossible to assess whether it is properly sized, whether the assumption that it will be empty before each storm is valid, or whether it will result in substantial increases in water flow into the BVW and rare and endangered species habitat.
- 6) The effect of the drainage system on the wetlands to the North of the soccer fields is not considered where it appears from the design that there will be a net diversion of water from this side of the project site which could cause a loss of this BVW and rare and endangered species habitat. An analysis of this issue should be included in the drainage calculations.
- 7) Evapotranspiration is largely mediated by plant interception (leaves, roots), evaporation, and photosynthesis. These processes occur in the forest and natural turf, but would be eliminated with artificial turf. Direct evaporation from the artificial turf may occur to some degree but is likely to be small because of its high permeability and maintenance to avoid standing water. Based upon typical regional precipitation and evapotranspiration rates, average discharge from the fields could

increase from ~23 in/yr up to ~43 in/yr because of this mechanism. This increase in discharge and its impact to BVW and rare and endangered species habitat is not considered in either the drainage design or the drainage calculations.

- 8) As a consequence of groundwater interception and loss of evapotranspiration, it is likely that the total annual volume of flow leaving the site in surface runoff and/or subsurface drainage will increase relative to the existing condition. Neither of these factors is addressed in the Plan. Potential impacts include:
 - a. The field/court under-drains may be saturated and detention pond water levels may be higher than assumed; this would invalidate the peak flow calculations presented in the Plan, which assume that ponds, under-drains, and infiltration basin are empty at the beginning of each simulated storm.
 - b. Bordering wetlands may be drained or otherwise adversely impacted by lower groundwater levels.
 - c. Changes in average flows and flow frequency distributions would alter depth regimes in the downstream wetlands, including a reduction in dry-out frequency resulting from an increase in base flows. Associated impacts on wetland ecological function and wildlife habitat have not been evaluated.
 - d. The increase in average and peak flows may increase erosion hazards associated with surface discharges from the detention ponds, overflows from the infiltration basin, swales, overland runoff, and erosion of natural drainage channels west of the site discharging into BVW and rare and endangered species habitat.
- 9) The design change from natural grass to artificial turf reduces the risk of water quality impacts associated with fertilizers and pesticides, however it will cause a net increase in export of nutrients and other water quality components from the artificial turf, as consequences of increased flows and elimination of filtration by through soils. For example, phosphorus export from undeveloped areas in the Northeast typically averages 5-10 mg/m²-yr, as compared with atmospheric deposition rates of 20-30 mg/m²-yr. The natural ecosystem traps phosphorus in vegetation and soils. This trapping function would be lost with the installation of artificial turf and rock under-drain system. Despite occasional field sweeping, a portion of the leaf and pollen deposition to the field surface will decompose and release soluble nutrients in the field under-drainage. This increased nutrient load will adversely impact the BVW and rare and endangered species habitat at the project site but is not discussed or considered in the Application.
- 10) The soccer field design may also cause increase acidity, release of toxic metals and cause a change in the inorganic composition of site drainage as a result of the artificial turf on the soccer fields. None of this is considered in the Application.

- 11) Middlesex committed to test for Oil and Hazardous materials when constructing replication Area B due to previous releases of oil and hazardous materials in that vicinity. Testing for oil and hazardous materials in that area should be made a condition of the final order of conditions.

- 12) It is interesting to note that while the proposed project does not include restrooms or even a drinking fountain, the plans call for the installation of a 3 inch sewer line and a 6 inch water line under the bridge. Patricia Huckery, testifying on behalf of Natural Heritage at the adjudicatory hearing in this matter testified that the presence of an active sewer line over BVW and rare and endangered species habitat posed an unacceptable risk. The Petitioners request that either the Applicant be required to remove the sewer and water lines or come forward with its true development plans and not violate the non-segmentation rule of the WPA. These lines are clearly not need for the current project and the Applicant should not be allowed to install them unless it comes forward with an explanation of need and then submits its entire intended project to review.

WHEREFORE, the Petitioners and William W. Walker, Ph.D. hereby request that the Application for Amendment to the Final Order of Conditions in this matter be denied until the Applicant comes forward with valid and adequately supported drainage system designs and drainage calculations, all of the concerns raised here and in the attached opinion letter of William W. Walker, Ph.D. are properly addressed, and that the comments 11 and 12 be incorporated into any final order of conditions.

Respectfully submitted,

/s/ Mark W. Roberts
McRoberts, Roberts & Rainer, L.L.P.,
Exchange Place, 53 State Street
Boston, Mass. 02109
Attorneys for [Petitioners]