SITE PLAN REPORT

City Of Middletown Wetlands Application
Proposed Middletown High School
Wilderman's Way
HRP# DEC0002.PC

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A. Biological Evaluation of Affected Wetlands

The construction proposed for the high school building, access drives, parking and associated athletic fields will affect 0.85 acres of wetland, or 2.21%, of a total of 38.5 acres of wetland on the property. The final design took into consideration avoiding and minimizing this impact area while also accomplishing the Building Committee goals for the new school campus. Through the *Wetland Report* provided by Connecticut Ecosystems, it was determined that the impacted areas had the botanical species and functions listed in the table below. The complete *Wetland Report* is one of the supporting documents for the current IWWA Permit Application.

IMPACT AREA NO.*	DOMINANT BOTANTICAL SPECIES	FUNCTIONS
W1A-1 (3,871 ft²)	Tartarian honeysuckle	• Stormwater conveyance • Groundwater recharge • Pollutant removal
W1A-2 (17,974 ft²)	Red Maple Tartarian honeysuckle Skunk cabbage	• Stormwater conveyance • Groundwater recharge • Pollutant removal • Wildlife habitat
W1B-1 (1,196 ft²)	Red Maple	• Groundwater recharge • Flood flow alteration • Pollutant removal • Wildlife habitat
W1B-2 (143 ft²)	Red Maple	• Groundwater recharge • Flood flow alteration • Pollutant removal • Wildlife habitat
W1B-3 (683 ft²)	Red Maple	• Groundwater recharge • Flood flow alteration • Pollutant removal • Wildlife habitat
W1C-1 (826 ft²)	Sedge, grass, rush	• Groundwater recharge • Pollutant removal • Wildlife habitat
W1C-2 (886 ft²)	Purple loosestrife (invasive plant)	• Groundwater recharge • Pollutant removal • Wildlife habitat
W10-1 (10,682 ft²)	Sedge, grass, rush	• Groundwater recharge • Pollutant removal

*Area numbers correspond to attached map "Wetland Application Key Map"

A series of soil borings and monitoring wells installed on the site for geotechnical considerations revealed groundwater levels, as measured in June 2004, that ranged from 7 feet below existing grade at the southwest portion of the site development area, to 5 feet below existing grade in the eastern portion of the development area, and 1 foot below existing grade along the northern edge of the development area. A Groundwater Contour Map is included with the Geotechnical Report, which is dated July 16, 2004, and is a supporting document attached to this IWWA Permit Application.

B. Materials Analysis

Wetland disturbance is proposed in eight (8) locations on this parcel for the purposes of constructing the features noted below.

- High School building
- Bus loop
- Entrance at Wilderman's Way
- Access drives
- Parking
- Athletic fields
- Culvert replacements on East Swamp Brook
- Slope stability

Approximately 10,000 cy of clean fill and controlled engineering material is expected to be placed primarily within three of the eight impacted wetland areas: W1A-1, W1A-2 & W10-1. Minimal quantities, totaling 45 cy, are expected to be placed in three of the other areas. No fill is proposed in W1B-1 & W1C-1. During construction and until the site is stabilized, Best Management Practices (BMP) consistent with DEP's *2002 Connecticut Guidelines for Soil Erosion and Sediment Control* will be in place to prevent erosion and subsequent deposition of soils. Sedimentation control systems will be installed along undisturbed wetlands; stockpiles will be ringed with a sedimentation control system; and a temporary sedimentation basin will be constructed to intercept and retain sediments during construction. A complete Erosion & Sedimentation Control Plan is included in the engineering drawings provided with this application package.

Application Item #10 lists the quantities and describes the general types of materials that will be placed in each affected area.

C. Description of Proposed Construction

The proposed access drives and parking areas will be constructed of processed aggregate and sub-base material, and bituminous concrete pavement. The combined High School and Vo-Ag building will be founded on concrete spread footings. See July 2004 Geotechnical Report included with this application for additional detail regarding the building foundation.

Other constructed site features will include the athletic facilities listed below. Athletic fields will be constructed with engineered material specific to use.

- Baseball & softball fields, including constructed dugouts
- A combined football and soccer facility, including bleachers & a small ticket/concession building
- Outdoor track, including designated areas for field events (e.g. shot-put, high jump, etc.)
- Practice fields

Finally, the existing site topography will require earthwork to cut the western portion of the site, as well as a retaining wall, located along the utility easement at the southern property boundary, that will be necessary to effectively utilize the site.

D. Proposed Activity Affect on Watercourses

East Swamp Brook is the primary watercourse traversing the site. Two (2) deteriorating culverts, one under Wilderman's Way and a second under the access to the northeast athletic fields, will be replaced. Temporary disturbance associated with culvert construction will be controlled by BMPs specified in the Erosion & Sedimentation Plan. No fill material is proposed at the northerly culvert and minimal fill (20 cy) is proposed at the southerly Wilderman's Way location. At both replacement sites, native material will be salvaged before construction and reused after culvert installation, followed by loaming and seeding. Rather than the use of riprap, erosion control matting will be used for slope stabilization.

Other proposed watercourse impacts on the site include the filling of two (2) man-made interceptor & drainage ditches, WC-1 and WC-2, shown on the *Wetlands and Soils Map* and the *Wetland Application Key Map*. These impacts are essentially the same as those previously proposed under Application 03-22, although the current application includes filling 1039 linear feet while the 2003 application included filling 1199 linear feet.

Developments can represent sources of pollutants to downstream receiving waters due to construction disturbance and increased impervious area. As previously noted, a comprehensive Erosion & Sedimentation Control Plan designed to eliminate & minimize construction impacts to East Swamp Brook and its drainage tributaries is included with this application. Post-construction features that will eliminate & minimize receiving water quality impacts include the following. See engineering drawings for details. Refer to the attached Key Map for outlet locations and to Section F below for additional outlet detail.

Outlet #1: Vortechnics separator, designed to capture & treat the "Water Quality Flow," followed by a Water Quality Pond.

Outlet #2: Vortechnics separator, designed to capture & treat the "Water Quality Flow," followed by a Water Quality Pond.

Outlet #3: Deep sumps (4' deep) – Only 2 catch basins in system.

Outlet #4: Vortechnics separator, designed to capture & treat the entire design flow (i.e. 10-year flows).

Outlet #5: Vortechnics separator, designed to capture & treat the entire design flow (i.e. 10-year flows).

The following sections address the pollutants of concern as listed in the Middletown inland wetlands regulations. In addition, BMPs are recommended for the proper management of lawn and turf areas with respect to fertilizer, herbicide and other chemical applications.

1. Affect on pH

This project is not expected to affect the pH of site watercourses. Such affects are generally associated with certain industrial materials and processes, none of which are proposed.

2. Affect on Turbidity

Turbidity in rivers and streams typically increases during and just after rainstorms. Due to the area of disturbance for this project, erosion and sedimentation control systems will be installed to prevent migration of sediments into receiving waters during construction and post-construction. Final design of the on-site drainage system utilizes stormwater treatment practices that increase the hydraulic residence time, slow down the velocity of the stormwater runoff and utilize the filtering capability of plant growth.

3. Bacterial Affects

Bacteria, if found in a watercourse, can come from several potential sources including animal waste, failing septic systems, and elicit sanitary connections. The proposed sanitary system will include laterals from the high school and Vo-Ag facility and the ticket/concession building that will be connected to the existing municipal sanitary sewer in Wilderman's Way. The small animal pens associated with the Vo-Ag facility will also drain to the sanitary system.

4. Affect on Flow Rates

Development can alter the hydrologic regime of a site or watershed as a result of increases in impervious surfaces. Results of the drainage study and site plan engineering, completed by A-N Consulting Engineers, will provide the necessary site features to maintain post-development peak flows at or below pre-development conditions.

Engineering measures used on the site are described in the *Hydrographic and Stormwater Drainage Analyses* by A-N Consulting Engineers, attached to this application as a supporting document. Two complete copies of the A-N report have been submitted with this Application.

5. Athletic Field/Lawn Care Best Management Practices

The athletic field/lawn care practices adopted by the Board of Education will be dedicated to minimizing any contamination of stormwater from chemical applications.

The maintenance plan put into use will be considerate of the following recommended BMPs offered by the Connecticut Department of Environmental Protection and the UCONN Cooperative Extension System:

Fertilizing

- Soil testing prior to fertilizer application to ensure that appropriate fertilizers are selected and the rate of fertilizer application is suitable for the soil conditions.
- Slow-release organic fertilizer use with its lower toxicity and less likely chance of entering stormwater runoff.
- Fertilizing timed to benefit the target species of grasses.
- Fertilizer not applied after mid-September.
- Fertilizer not applied on windy days or immediately before an expected significant rainfall event.

Pesticides & Herbicides

- Chemicals not used unless absolutely necessary, and then be selected to specifically target the pest of concern.
- Potential pests (e.g. weeds, grubs, etc.) will be positively identified to enable the targeted selection of chemicals.
- Select the least toxic pesticide that targets the pest of concern.

Using these recommendations, the Board of Education will establish an athletic field/lawn care maintenance plan that incorporates appropriate BMPs.

E. Proposed Mitigation Measures

Following is a brief summary of the impacted wetland areas. Refer to the attached Wetland Application Key Map for locations. Also, see the table provided in Item #10 of the City's application form.

- The W1A-1 impact area is a constructed drainage ditch. Several storm drains currently discharge to it from parking lots associated with Woodrow Wilson School and from other paved areas. Filling this area is necessary to effectively develop the site by grading several level "platforms" on which to locate the proposed school building, football/soccer facility and other proposed athletic fields.

- The W1A-2 impact area is a constructed drainage ditch in its southern half and wooded swamp in its northern half. Again, fill is necessary in this area to create a relatively level surface on which to build. The impacted wetland area itself will be used for building footprint and the bus loop.

- The existing East Swamp Brook culvert under the access road to the northeast athletic fields is deteriorating and will be replaced. W1B-1 is the impact area at the four banks at the culvert ends. No fill will be necessary at this impact area.

- W1B-2 impact results at the toe of slope for the fill material proposed in this general area. A minimal quantity of fill material, 5 cy, is proposed.

- W1B-3 and W1C-1 are located respectively at the northern and southern ends of the East Swamp Brook culvert under Wilderman's Way. The impact is associated with the proposed culvert replacement work. Most of it is temporary impact during construction. Twenty (20) cubic yards of fill will be placed in the W1B-3 area.

- W1C-2 is located near the entrance to the site at the intersection of Wilderman's Way and Newfield Street. These impacts and a limited amount of fill material are being proposed in order to widen approximately 200' of Wilderman's Way for the safety of providing a turning lane.

- W10-1 is the removal of an existing drainage swale which presumably was constructed to intercept surface runoff before it could reach the current football and track area. This impact area will be a part of the "platform" created on which to locate the building and associated access drives and parking. The proposed drainage system will eliminate the need for this interceptor swale.

The four (4) mitigation areas on the site are proposed adjacent to existing wetlands in the northeast quadrant of the property. Explanation of their detailed design and function replacement can be found in the separate Mitigation Report prepared by CT Ecosystems. The total 2.25 acres of mitigation proposed include 1.3 acres of wetland creation and 0.95 acres of wetland enhancement.

Additional proposed mitigating features include the execution of two (2) conservation easements – one in the northwest quadrant surrounding the wetland pools, and a second in the northwest quadrant designed to connect existing wetlands that lie north and south of Mitigation Area 'C' and are presently separated by an area of mostly wooded upland.

F. Proposed Drainage System

The proposed drainage design includes a system of catch basins, pipes, manholes, culverts and pipe outlets. In addition, Vortechnics separators are proposed as noted above.

See the engineering drawings and drainage calculations for a technical description of the system and its treatment facilities.