Connecticut Ecosystems LLC
HRP Associates, Inc.

WETLAND MITIGATION REPORT

MIDDLETOWN HIGH SCHOOL

Middletown, Connecticut

July 22, 2004

CE Project 01-400 File c:\projects 2004\01-400\mitigation report (2004).doc

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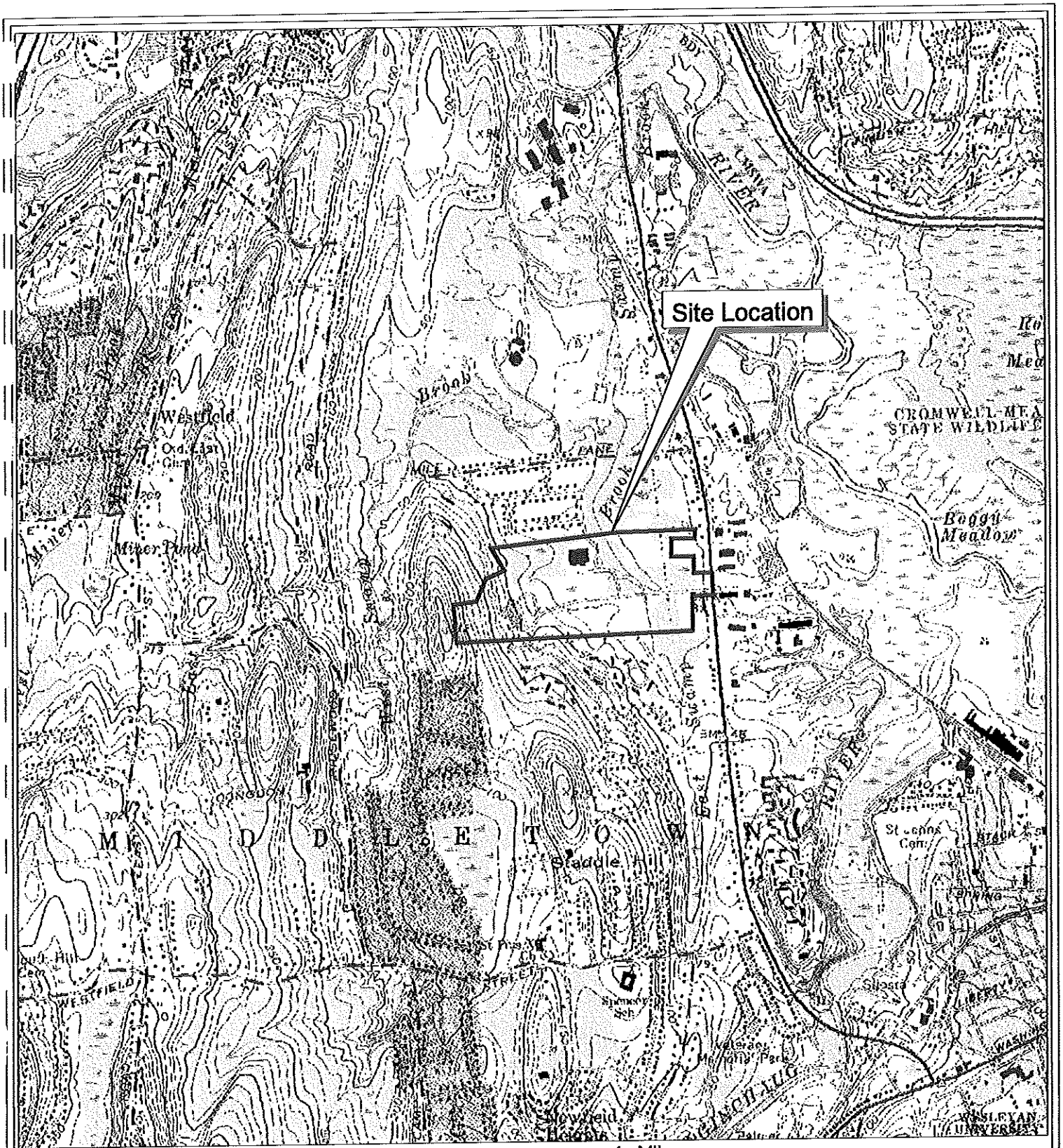

MIDDLETOWN, CONN
41072-E6-TF-024
1965
PHOTOREVISED 1992
DMA 6467 II SW-SERIES V816

Figure 1
Site Location
Proposed Middletown High School
Wilderman's Way
Middletown, CT 06457
HRP# DEC0002.PC

COLOR PHOTOGRAPHS

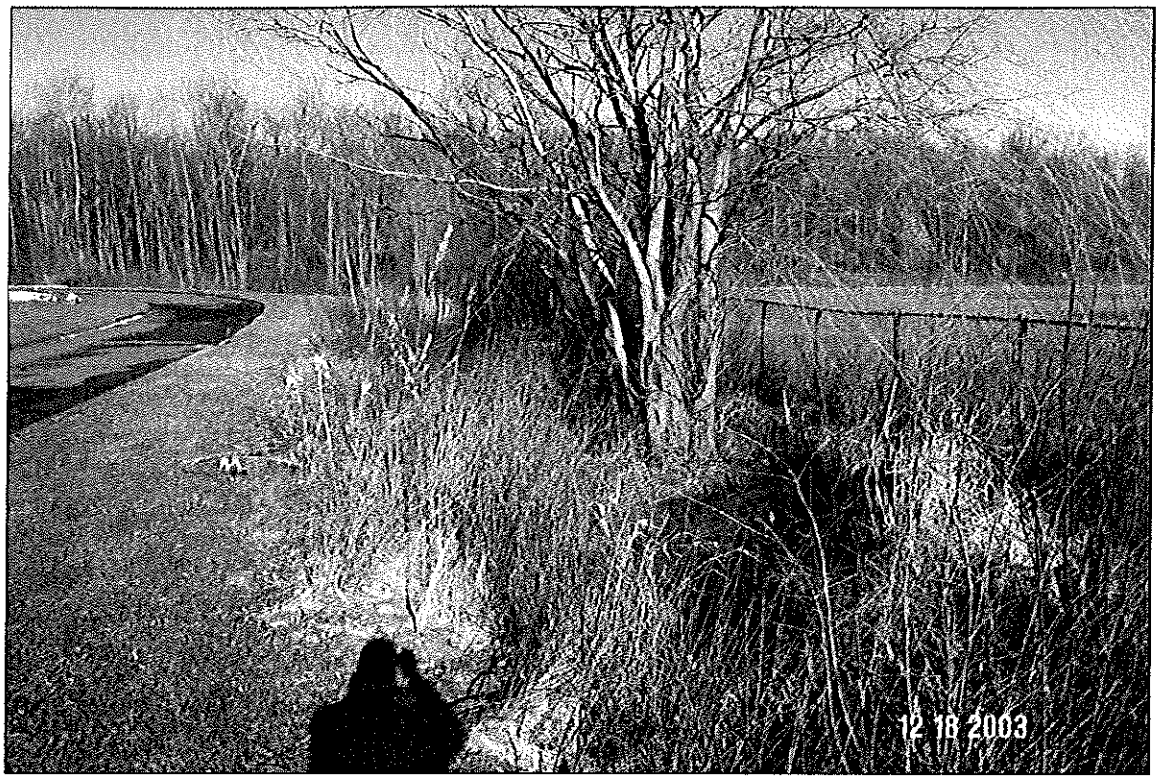

Photo 1.Wetland Impact Area 1A-1

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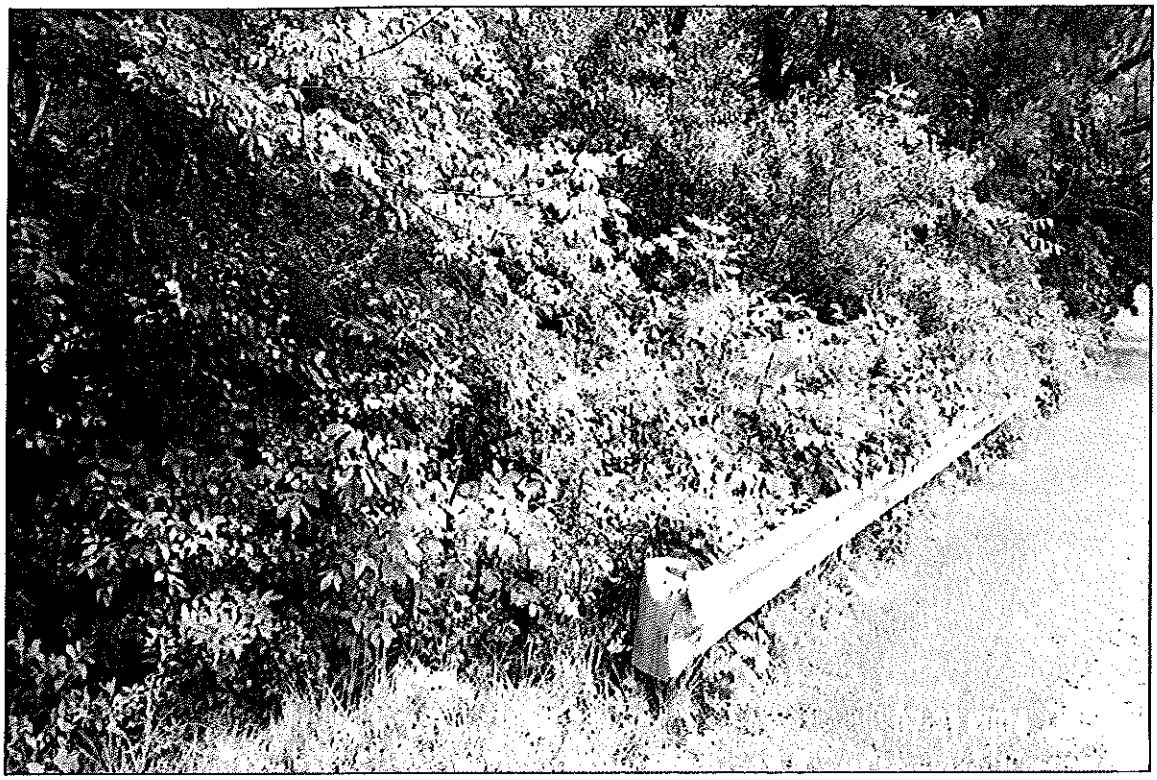

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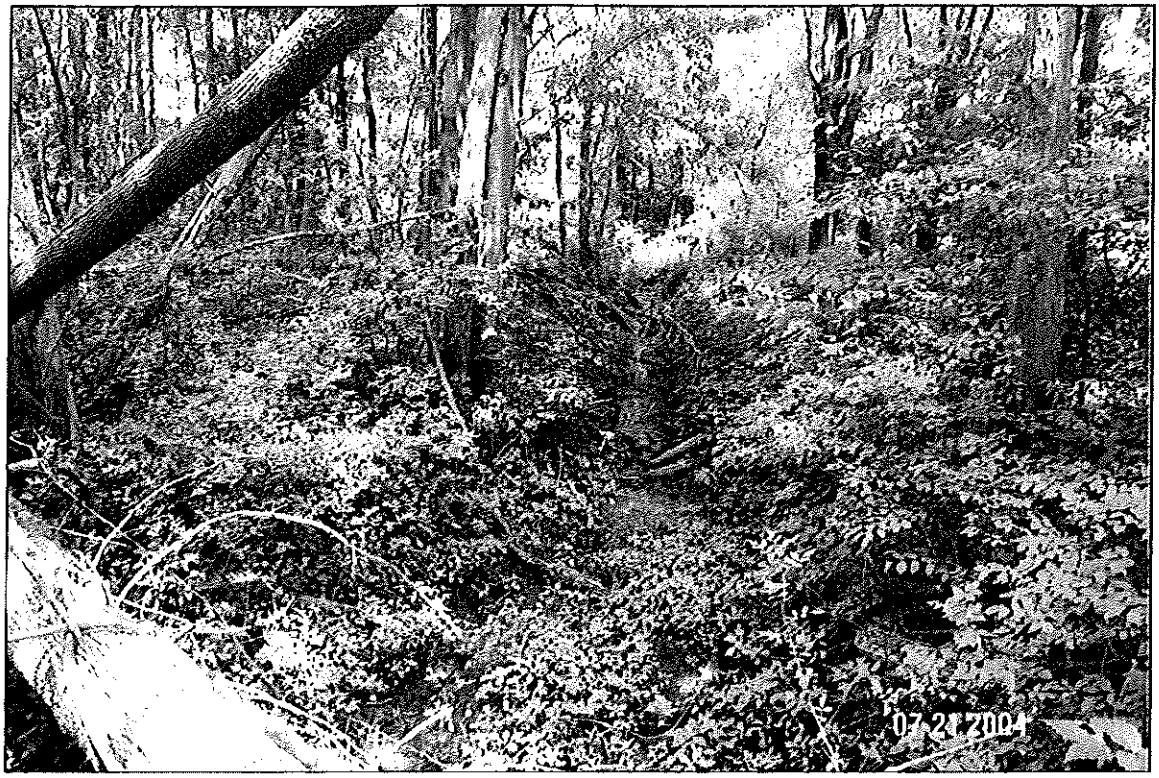

Photo 9. Watercourse Impact Area WC-1

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Photo 11. Wetland Mitigation Area A

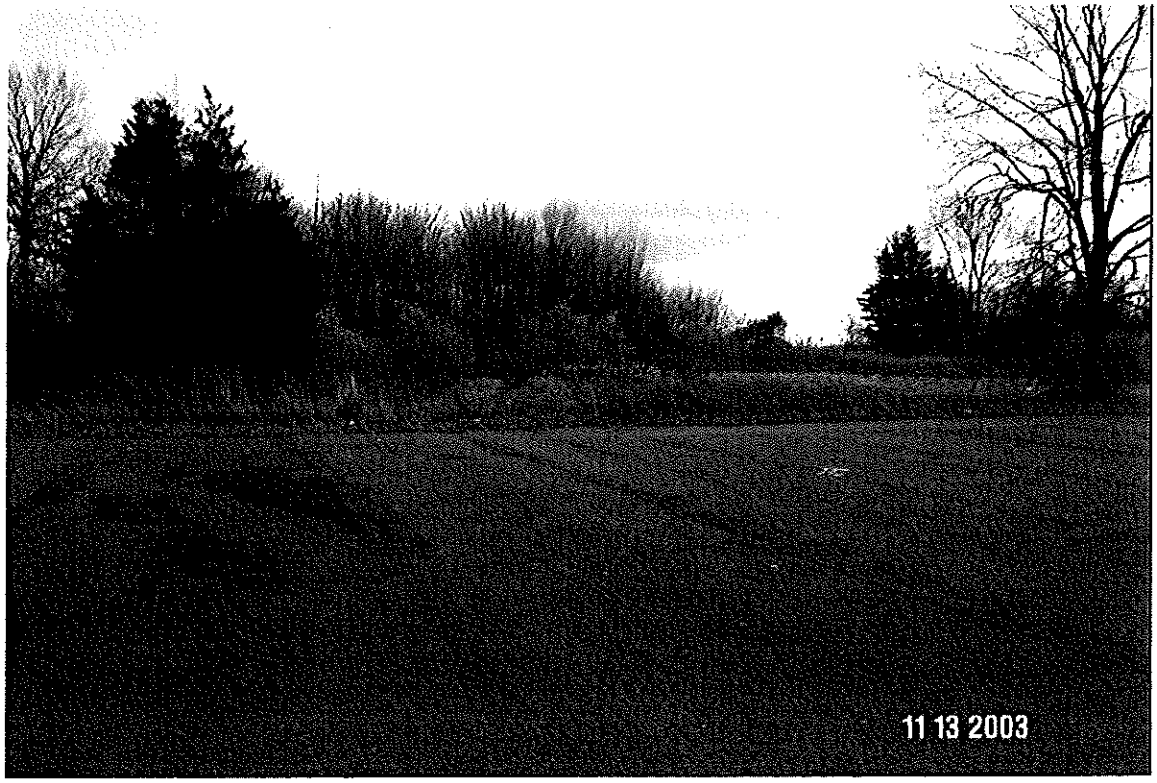


Photo 12. Wetland Mitigation Area B

Photo 13. Wetland Mitigation Area C (Creation)

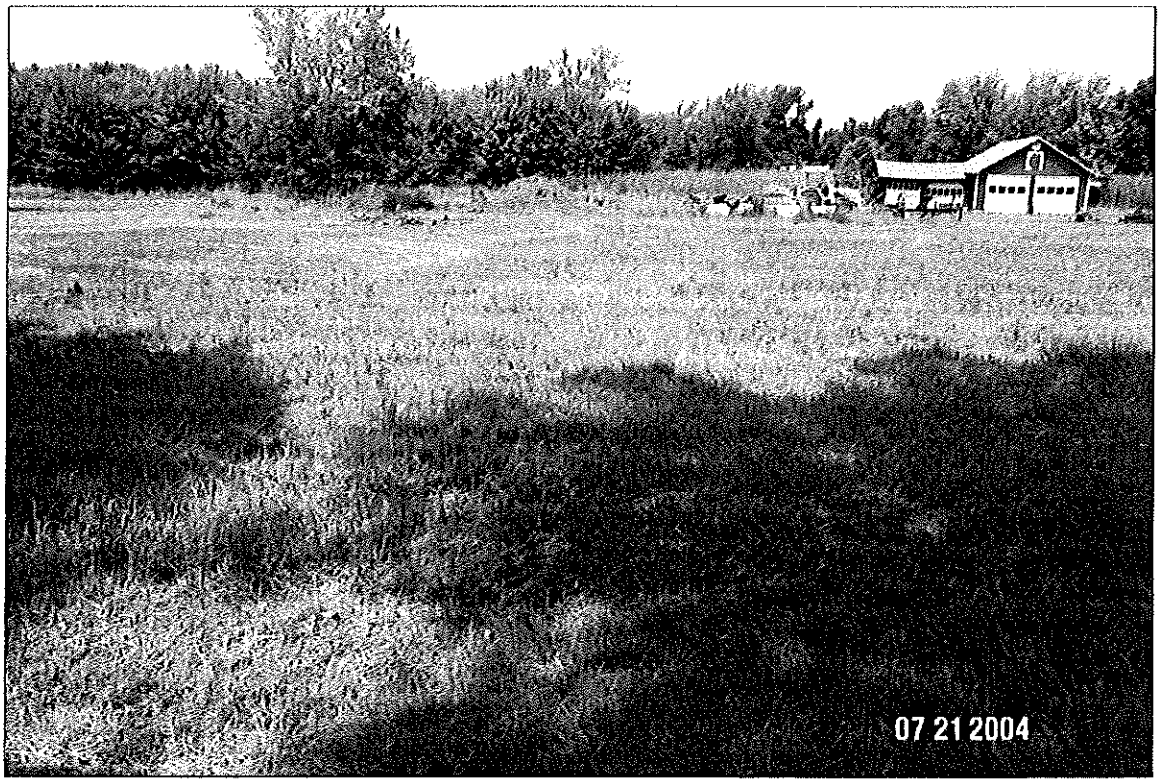


Photo 14. Wetland Mitigation Area C (Enhancement)

Photo 15. Wetland Mitigation Area C (Creation)

1.0 INTRODUCTION

The construction of a new high school and athletic fields is proposed in Middletown, CT. The subject property contains a large amount of regulated wetlands, which are characterized in data sheets provided in Appendix 1 of this report. As part of this construction there will be an impact to 36,935 square feet (0.85 acres) of regulated wetlands and 1,039 linear feet of man-made intermittent watercourses (Table 1). Site plans went through several iterations in order to reduce the wetland impact to the greatest possible extent. The remaining impact is considered unavoidable, since the expansion is necessary to satisfy educational and program requirements.

In order to compensate for this unavoidable wetland impact, a mitigation plan to create and/or enhance 97,849 square feet (2.25 acres) of wetlands is proposed (Table 2). Forested, scrub-shrub and emergent wetland types will be created to compensate for the types of wetlands that will be eliminated by the project (Tables 1 and 2). The ratio of mitigation:impact wetland area is a very favorable 2.65. Moreover, the wetland functions that will be eliminated by the project will be recreated through the mitigation plan.

Stand pipes have been installed in the four proposed wetland creation areas for the purposes of ground water monitoring, which began on December 9, 2003 and will continue in the future. The data that will be collected will allow the refinement, if necessary, of the grading plans for these areas based upon measured ground water elevations.

All of the wetland creation mitigation areas will be constructed in upland sites adjacent to existing wetlands. These wetland creation areas will be excavated to approximately match the elevation of the adjacent wetland in order to establish a suitable hydrologic regime.

A thick clay layer at a depth of 2-3 feet was observed by HRP Associates, Inc. in test pits that were dug in or near the proposed mitigation areas (Appendix 2):

Test Pit #	Mitigation Area	Depth to Restrictive Layer
10	G	Silt & clay at 2.4' depth
11	D	Clay at 0.5' depth
13	A	Clay at 2.5' depth
14	B	Clay at 5'± depth
3A	E	Clay at 2' depth

These clay restrictive layers impede the downward movement of ground water, causing a perched seasonally high water table in the existing wetlands. A similar condition will be created in the creation mitigation wetlands.

2.0 WETLAND IMPACT AREAS

A total of 36,935 square feet (0.85 acres) of regulated wetland areas will be impacted by the project. These impacts will be to eight discrete areas, as described below.

2.1 Wetland Impact Area 1A-1 (3,871 square feet)

This area is a small portion of what is referred to as Wetland 1A in the Wetlands Report prepared by Connecticut Ecosystems LLC (Photo 1). This narrow area is bordered to the east by an athletic field and to the west by a school driveway. It contains a constructed channel (1-3 feet wide) that receives water from a culvert and drains it to a large wooded swamp to the north. Runoff from the Middle School parking lot also discharges to this area via a culvert. Thick deposits of red sand lie on the banks of the linear watercourse channel. Willow, alder, silky dogwood, purple loosestrife and common reed grow in this area.

The linear flow pattern in the intermittent watercourse channel, and short runoff residence time, limit the potential of this wetland area to remove water-borne pollutants.

2.2 Wetland Impact Area 1A-2 (17,974 square feet)

This area is part of what is referred to as Wetland 1A in the Wetlands Report prepared by Connecticut Ecosystems LLC. This area includes a linear drainage feature located between two athletic fields (Photo 2). An intermittent watercourse (8-10 foot wide channel), which originates at a culvert and headwall, flows north through the center of this area. Red maple, silky dogwood, gray dogwood, multiflora rose and common reed occur in this area. The linear flow pattern in the intermittent watercourse channel, and short runoff residence time, limit the potential of this wetland area to remove water-borne pollutants.

This Impact Area includes a section that lies parallel to Wildermans Way (Photo 3). This marsh receives and renovates runoff that drains into it from the curbless road. The dense stand of broadleaf cattail that grows in this area is an excellent water quality renovation feature.

2.3 Wetland Impact Area 1B-1 (1,196 square feet)

This area is a small portion of what is referred to as Wetland 1B in the Wetlands Report prepared by Connecticut Ecosystems LLC. The wetland occurs on both sides of a paved path that leads from Keigwin School to a basketball court and open field (Photo 4). A culvert carries flow below the path. Silky dogwood, alder, swamp white oak and multiflora rose grow in this area.

This small area contributes minimally to the principal functions associated with Wetland 1B.

2.4 Wetland Impact Area 1B-2 (143 square feet)

This area is a very small portion of what is referred to as Wetland 1B in the Wetlands Report prepared by Connecticut Ecosystems LLC. It occurs as an unmowed wet meadow, adjacent to Mitigation Area D.

This small area contributes minimally to the principal functions associated with Wetland 1B.

2.5 Wetland Impact Area 1B-3 (1,246 square feet)

This area is a very small portion of what is referred to as Wetland 1B in the Wetlands Report prepared by Connecticut Ecosystems LLC. It occurs at the edge of a deciduous wooded swamp located adjacent to Wildermans Way, adjacent to a culvert that carries flow north below the road (Photo 5). Flora in this area includes red maple, American elm, multiflora rose, white ash, buckthorn, autumn olive and silky dogwood.

This small area contributes minimally to the principal functions associated with Wetland 1B.

2.6 Wetland Impact Area 1C-1 (1,144 square feet)

This area is a very small portion of what is referred to as Wetland 1C in the Wetlands Report prepared by Connecticut Ecosystems LLC. It occurs at the edge of a very densely vegetated shrub swamp located adjacent to Wildermans Way, adjacent to a culvert that carries flow north below the road (Photo 6). A beaver dam lies immediately upstream of this culvert. Flora in this area includes green ash, American elm, red maple, honeysuckle, alder, purple loosestrife and jewelweed.

This small area contributes minimally to the principal functions associated with Wetland 1C.

2.7 Wetland Impact Area 1C-2 (679 square feet)

This area is located at the northeast corner of what is referred to as Wetland 1C in the Wetlands Report prepared by Connecticut Ecosystems LLC (Photo 7). This small area supports a dense growth of saplings and shrubs (green ash and multiflora rose). To the south lies a large marsh containing cattail and purple loosestrife.

This small area contributes minimally to the principal functions associated with Wetland 1C.

2.8 Wetland Impact Area 10-1 (10,682 square feet)

This area is referred to as Wetland 10 in the Wetlands Report prepared by Connecticut Ecosystems LLC. This linear constructed swale intercepts runoff from the hillside to the southwest and prevents it from flowing onto an adjacent running track (Photo 8).

The principal function associated with this wetland is Pollutant Removal.

3.0 INTERMITTENT WATERCOURSE IMPACT AREAS

3.1 Watercourse Impact Area WC-1 (754 linear feet)

This constructed intermittent watercourse occurs in the forest west and upslope of Woodrow Wilson Middle School (Photo 9). The channel was apparently created to intercept runoff from the hillside and prevent it from flowing towards the school building. The steep-banked channel is flanked by spoil piles that were created during channel construction. The channel contains locally heavy accumulations of red sandy sediments. The channel excavation intercepted a seasonal high water table, which results in a seasonal discharge of ground water in the channel.

The elimination of this constructed channel is not considered a significant impact due to its low functional value.

3.2 Watercourse Impact Area WC-2 (285 linear feet)

This narrow constructed channel is located east of a maintenance building. It occurs within a very dense shrub thicket that includes alder, autumn olive, multiflora rose and silky dogwood (Photo 10). The channel carries surface flow for a short distance between two culverts. The channel is lined with a heavy accumulation of sandy sediments.

The elimination of this constructed channel is not considered a significant impact due to its low functional value.

4.0 WETLAND MITIGATION AREAS

Mitigation Area site plans prepared by HRP Associates, Inc. are included in Appendix 1. Below is a discussion of each mitigation area.

4.1 Mitigation Area A (7,838 square feet)

4.1.1 Description of Existing Conditions

Area A is currently a very gently sloping upland meadow located between a palustrine emergent wetland and a paved path that leads from Keigwin School to a basketball court (Photo 11). The emergent wetland lies immediately adjacent to and north of Area A. Reed canary grass, plantain and redtop grow in this area.

4.1.2 Proposed Hydrology

Area A is immediately adjacent to a palustrine wetland whose elevation ranges from 18-20+ feet. Area A will be graded to a bottom elevation of 18.8 feet. The same hydrology that drives the adjacent wetland – a seasonal high ground water table – will also influence the mitigation wetland. Preliminary monitoring well data (Test Pit 13) shows a ground water elevation of 19.80 feet on 12/9/03. The installed standpipe will continue to be monitored up to the time of wetland creation in order to determine whether any adjustments in the grading plan are necessary.

4.1.3 Proposed Wetland Type

Area A is designed as a palustrine forested, broad-leaved deciduous, seasonally saturated wetland (PFO1E). Accordingly, 80 trees, 220 shrubs and 860 herbs will be planted in this mitigation area (Table 3).

4.1.4 Proposed Functions

Mitigation Area A will provide the following primary functions: Groundwater Recharge, Floodflow Alteration, Pollutant Removal, Wildlife Habitat and Educational/Scientific Value. Surface water that collects in this created depression will have an opportunity to infiltrate the soil, be renovated by vegetation and soil microbes, be retained as flood storage, as well as attract a variety of wildlife species. It could also serve as an outdoor laboratory for students to monitor changes in its vegetative and wildlife communities over time.

4.2 Mitigation Area B (12,645 square feet)

4.2.1 Description of Existing Conditions

Area B is currently a very gently sloping upland shrub thicket/meadow, along with part of a paved basketball court, located immediately south and west of a palustrine scrub-shrub wetland (Photo 12). A mature red cedar tree, along with a gray dogwood thicket, lie along the north end of this area. Goldenrods, milkweed and grasses grow in the upland meadow.

4.2.2 Proposed Hydrology

Area B is immediately adjacent to a palustrine wetland. Area B will be graded to a bottom elevation of 24.25 feet. The same hydrology that drives the adjacent wetland – a seasonal high ground water table – will also influence the mitigation wetland. Preliminary monitoring well data (Test Pit 14) shows a ground water elevation of 25.27 feet on 12/9/03. The installed standpipe will continue to be monitored up to the time of wetland creation in order to determine whether any adjustments in the grading plan are necessary.

4.2.3 Proposed Wetland Type

Area B is designed as a palustrine forested, broad-leaved deciduous, seasonally saturated wetland (PFO1E). Accordingly, 125 trees, 355 shrubs and 1,390 herbs will be planted in this mitigation area (Table 3).

4.2.4 Proposed Functions

Mitigation Area B will provide the following primary functions: Groundwater Recharge, Floodflow Alteration, Pollutant Removal, Wildlife Habitat and Educational/Scientific Value. Surface water that collects in this created depression will have an opportunity to infiltrate the soil, be renovated by vegetation and soil microbes, be retained as flood storage, as well as attract a variety of wildlife species. It could also serve as an outdoor laboratory for students to monitor changes in its vegetative and wildlife communities over time.

4.3 Mitigation Area C-Creation (29,246 square feet wetland creation)

4.3.1 Description of Existing Conditions

Area C (creation) is currently the southwest corner of a gently sloping upland mowed grass field located immediately west of a palustrine emergent wetland (wet meadow). It is bordered to the south and west by an upland mixed hardwoods forest (Photo 13).

4.3.2 Proposed Hydrology

Area C (creation) is immediately adjacent to a palustrine wetland whose elevation ranges from 25 to 26 feet. This creation area will be graded to a bottom elevation of 24.0 feet. The same hydrology that drives the adjacent wetland – a seasonal high ground water table – will also influence the mitigation wetland. A stand pipe was installed in a dug hole, and on 12/22/03 the ground water elevation was measured at 25.0 feet. The installed standpipe will continue to be monitored up to the time of wetland creation in order to determine whether any adjustments in the grading plan are necessary.

4.3.3 Proposed Wetland Type

Area C (creation) is designed to include two wetland types:

- palustrine forested, broad-leaved deciduous (26,251 square feet)
- palustrine scrub-shrub (2,995 square feet)

The proposed trees, shrubs and herbs that will be planted in this mitigation area are shown in Table 3.

4.3.4 Proposed Functions

Mitigation Area C (creation) will provide the following primary functions: Groundwater Recharge, Floodflow Alteration, Pollutant Removal, Wildlife Habitat and Educational/Scientific Value. Surface water that collects in this created depression will have an opportunity to infiltrate the soil, be renovated by vegetation and soil microbes, be retained as flood storage, as well as attract a variety of wildlife species. It could also serve as an outdoor laboratory for students to monitor changes in its vegetative and wildlife communities over time.

4.4 Mitigation Area C-Enhancement (41,530 square feet wetland enhancement)

4.4.1 Description of Existing Conditions

Area C (enhancement) is currently a seasonally saturated wet meadow located in a broad swale at the northeast end of the property (Photo 14). This wetland area is periodically mowed by a neighboring landowner, which diminishes its vegetative diversity. Soft rush is the dominant hydrophyte in this wet meadow.

4.4.2 Description of Enhancement Measures

In order to enhance the quality of this wetland, three measures are proposed. First, the area will no longer be mowed in the future. Second, a variety of hydrophytes will be planted in the wetland in order to quickly improve its vegetative diversity (Table 3). Finally, two staggered rows of shrubs will be planted along the east edge of the wetland to improve its habitat and serve as a barrier to prevent any future mowing (Table 3).

4.5 Mitigation Area D (6,590 square feet)

4.5.1 Description of Existing Conditions

Area D is located at the southwest corner of a large, very gently sloping upland meadow (Photo 15). This Mitigation Area is located immediately north and east of a palustrine forested wetland. Goldenrods, soft rush, heal all and grasses grow in this upland meadow.

4.5.2 Proposed Hydrology

Area D is immediately adjacent to a palustrine wetland with spot elevations of 18.9 and 19.5 feet. Area D will be graded to a bottom elevation of 18.5 feet. The same hydrology that drives the adjacent wetland – a seasonal high ground water table – will also influence the mitigation wetland. Preliminary monitoring well data (Test Pit 11) shows a ground water elevation of 19.6 feet on 12/9/03. The installed standpipe will continue to be monitored up to the time of wetland creation in order to determine whether any adjustments in the grading plan are necessary.

4.5.3 Proposed Wetland Type

Area D is designed as a palustrine forested, broad-leaved deciduous, seasonally saturated wetland (PFO1E). Accordingly, 65 trees, 185 shrubs and 725 herbs will be planted in this mitigation area (Table 3).

4.5.4 Proposed Functions

Mitigation Area D will provide the following primary functions: Groundwater Recharge, Floodflow Alteration, Pollutant Removal, Wildlife Habitat and Educational/Scientific Value. Surface water that collects in this created depression will have an opportunity to infiltrate the soil, be renovated by vegetation and soil microbes, be retained as flood storage, as well as attract a variety of wildlife species. It could also serve as an outdoor laboratory for students to monitor changes in its vegetative and wildlife communities over time.

5.0 MITIGATION SOILS

The applicant proposes to fill 36,935 square feet of wetlands in conjunction with the project. Where feasible, topsoil will be stripped from these wetland areas and stockpiled for use in the mitigation areas. The primary concern is to avoid transporting seeds, roots and rhizomes of invasive and/or exotic flora along with the soil. Topsoil from a wetland impact area that contains invasive and/or exotic flora will not be used in the mitigation areas.

Topsoil will also be stripped from the mitigation areas, stockpiled, and used along with any stockpiled wetland soil in the final grading of the mitigation areas. A minimum of 12 inches of topsoil will be placed on the surface of each mitigation area during final grading.

The organic carbon content of the topsoil that will be used in the mitigation areas will be a minimum of 12 percent on a dry weight basis (21% organic matter), as determined by lab testing. If necessary, clean leaf mulch or similar will be added to the topsoil in order to achieve the desired organic carbon content.

Every effort will be made to minimize the compaction of soil by heavy machinery in the mitigation areas, since this can impede the growth and vigor of planted flora.

6.0 CONSTRUCTION & PLANTING DETAILS

A Professional Wetland Scientist will be on-site to monitor construction of the wetland mitigation areas to ensure compliance with the mitigation plan.

Compensatory mitigation will be initiated not later than 90 days after project initiation, and completed not later than the completion of the permitted project.

The optimal wetland mitigation planting time is spring (mid-April to mid-June), after plants have broken dormancy. This is a period when ground water and precipitation levels are generally high. If that is not feasible, a fall planting (September through mid-October) is recommended. In either case, too much or too little water can cause high plant mortality. Herbaceous plants established entirely below water will die due to lack of oxygen. Alternately, plants can desiccate during dry conditions. Plans will be made for supplemental irrigation (watering) in the event of extended dry weather following planting.

The on-center planting spacing and plant size in the mitigation areas will be as follows:

Type	On-Center Spacing (ft.)	Size
Tree	10	3-4'
Shrub	6	2-3'
Herbaceous	3	2" plug

The exception is Mitigation Area C (enhancement), in which herbaceous plants will be spaced at 6-feet on-center, since the wetland already supports dense herbaceous growth.

The on-center spacing listed in the above table satisfies the spacing requirement in the "Draft New England District Mitigation Guidance" document. Section G.6 of this document states that "*woody stock should be proposed to be planted in densities not less than 600 trees and shrubs per acre, including at least 400 trees per acre in forested cover types.*" In order to establish 400 trees per acre requires an on-center spacing of 10.4 feet. The on-center spacing for trees in the mitigation plan is 10 feet. In order to establish 600 shrubs per acre requires an on-center spacing of 8.5 feet. The on-center spacing for shrubs in the mitigation plan is 6 feet.

If necessary, planted trees and shrubs will be sprayed with a deer repellant in the event of heavy browsing.

During planting, a Professional Wetland Scientist may relocate up to 50 percent of the plants in each community type if as-built site conditions would pose an unreasonable threat to the survival of plantings installed according to the mitigation plan. The plantings shall be relocated to locations with suitable hydrology and soils and where appropriate structural context with other plantings can be maintained.

Temporary devices and structures to control erosion and sedimentation in and around mitigation sites shall be properly maintained at all times. The devices and structures shall be disassembled and properly disposed of no later than November 1 three full growing

seasons after planting. Sediment collected by these devices will be removed and placed upland in a manner that prevents its erosion and transport to a waterway or wetland.

7.0 SEED MIXES

New England WetMix (or equal) will be seeded in all wetland creation areas at a rate of 1 pound/2,500 square feet to ensure rapid revegetation of exposed soils and deter colonization by invasive and/or exotic flora. Ideally this seeding will be done in mid to late spring (May-June). However, if the construction schedule requires mitigation area grading in the late summer/early fall then WetMix will be seeded prior to October 15, and other plantings will be established during the subsequent May/June. The mitigation areas must not contain surface water at the time of seeding, since the seeds would float and not germinate. Moist surface soils provide the optimal germination substrate.

Information on this seed mix can be found at www.newp.com/seeds.html.

8.0 MONITORING WELLS

Following construction, a monitoring well (perforated PVC stand pipe) will be installed in each wetland creation area to allow for periodic determinations of the ground water level.

9.0 AS-BUILT PLANS

Once constructed and planted, the mitigation areas will be surveyed and as-built plans will be prepared and submitted to regulatory agencies. One-foot contour intervals will be used to depict topography within the mitigation areas. These plans will confirm that the mitigation areas were created as designed, and will serve as the basis for monitoring inspections and reports.

10.0 CONTROL OF INVASIVE PLANTS

It should be recognized that the mitigation areas will present an ideal substrate for the establishment of invasive plants, nearly all of which are non-native. A comprehensive list of these plants is found in the U.S. Army Corps of Engineers New England Division publication, "Performance Guidelines and Supplemental Information on the Checklist for Review of Mitigation Plan". Unfortunately, several of these plants (e.g., *Phragmites australis, Lythrum salicaria*) are prevalent on the subject property, and in some cases immediately adjacent to mitigation areas. These plants favor disturbed, exposed wet or moist soils. None of the plants on this list are included in the planting plan or seed mix.

Invasive plants discovered in small numbers in the mitigation areas during monitoring inspections will be removed by hand. Eradication of large patches of invasive plants may require spraying with an herbicide such as Rodeo by a licensed applicator.

The rapid establishment of native flora through plantings and seed mixes offers the best safeguard against colonization by nuisance invasive species.

11.0 COARSE WOODY DEBRIS

A supply of dead and dying woody debris shall cover at least 2% of the ground throughout the mitigation sites after the completion of construction of the mitigation sites. These materials should not include species shown on the list of invasive species in the New England District Mitigation Plan Guidance.

12.0 LONG-TERM MONITORING

The mitigation areas will be monitored for a period of five years following their creation. The first year of monitoring shall be the first year that the mitigation areas have been through a full growing season following construction and planting. The mitigation areas will be inspected at least twice each year (middle and end of growing season) to collect data for the annual monitoring report. The contents of the annual monitoring reports will include the four success standards contained in Section M of the "Draft New England District Mitigation Guidance" document (Appendix 4).

Additional items in the monitoring reports will include:

- description of monitoring inspections
- soils data collected after construction and every alternate year throughout the monitoring period
- monitoring well data
- description of any remedial actions taken during the monitoring year to meet the four success standards
- report on status of erosion control measures
- visual estimates of percent vegetative cover of non-invasive and invasive species at each mitigation site
- observed fish and wildlife at mitigation sites
- by species, a description of general health/vigor of surviving plants, the prognosis for their future survival and a diagnosis of the cause(s) of morbidity or mortality
- description of recommended remedial measures

13.0 ASSESSMENT INSPECTION & REPORT

At the end of the 5-year monitoring period an assessment of the mitigation areas will be conducted by a Professional Wetland Scientist who did not conduct the monitoring. The Assessment Report will:

- Summarize the original or modified mitigation goals and discuss the level of attainment of these goals at each mitigation site.
- Describe significant problems and solutions during construction and maintenance (monitoring) of the mitigation sites.
- Identify agency procedures or policies that encumbered implementation of the mitigation plan. Specifically note procedures or policies that contributed to less success or less effectiveness than anticipated in the mitigation plan.
- Recommend measures to improve the efficiency, reduce the cost, or improve the effectiveness of similar projects in the future.

Additionally, the Assessment Report will include the four appendices described in Section N of the "Draft New England District Mitigation Guidance" document (see Appendix 4 of this report).

14.0 CONSERVATION EASEMENTS

A total of 18.19 acres of land on the school property will be placed under a Conservation Easement. This includes 12.39 acres of forest land, which includes four vernal pools, at the northwest end of the site, and 5.8 acres of wooded upland adjacent to Mitigation Area C.

Table 1. Classification of Wetland Impact Areas					
	Wetland Classification				
Wetland Impact Area	**PFO1E**	**PSS1E**	**PEM5E**	**PEM3E**	**Total**
1A-1	3,871	0	0	0	3,871
1A-2	14,974	0	3,000	0	17,974
1B-1	1,196	0	0	0	1,196
1B-2	0	0	0	143	143
1B-3	1,246	0	0	0	1,246
1C-1	0	1,144	0	0	1,144
1C-2	0	679	0	0	679
10-1	0	0	0	10,682	10,682
Total	**21,287**	**1,823**	**3,000**	**10,825**	**36,935**

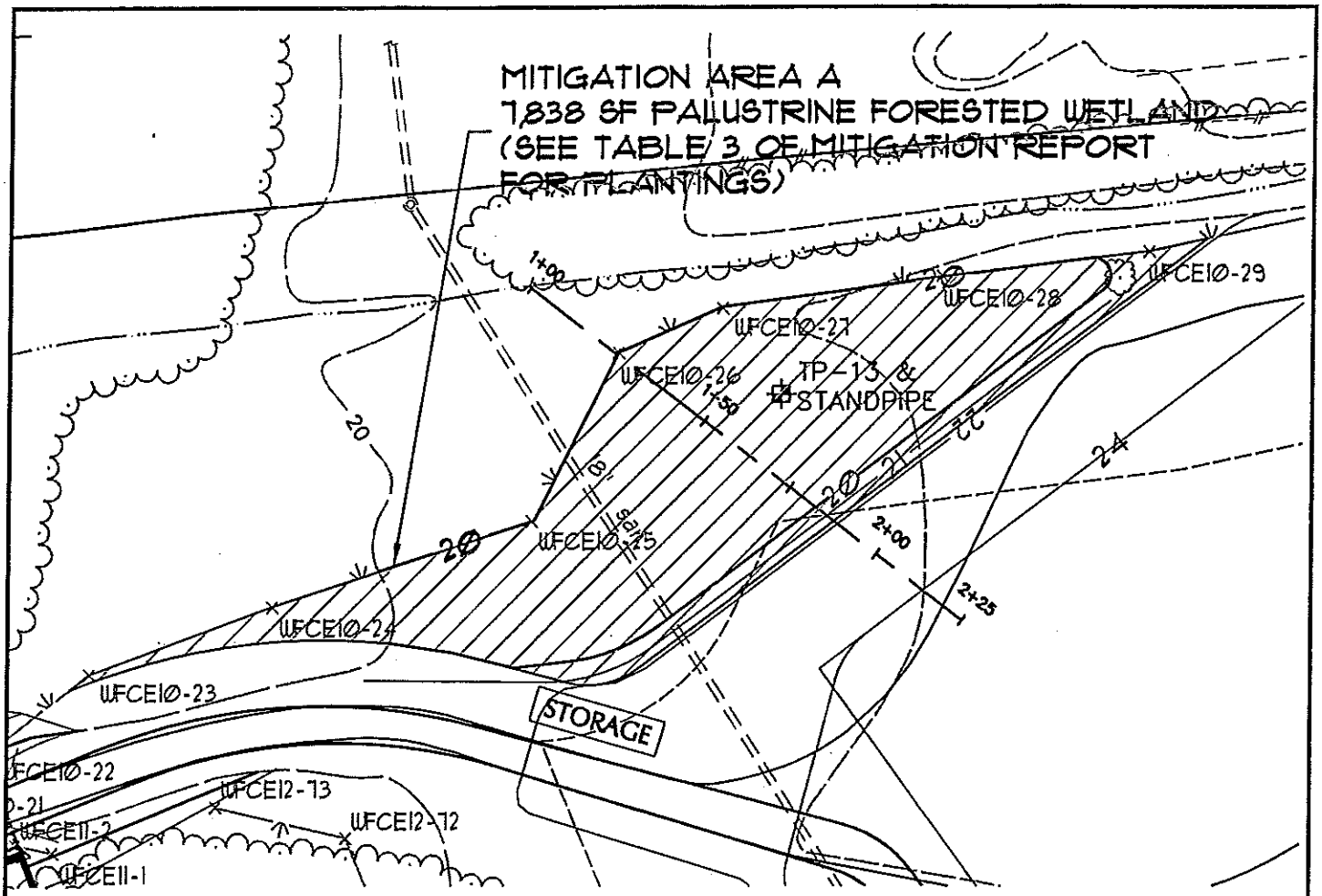
Table 2. Proposed Wetland Mitigation				
	Wetland Classification			
Wetland Mitigation Area	**PFO1E**	**PSS1E**	**PEM3E**	**Total**
A	7,838	0	0	7,838
B	12,645	0	0	12,645
C (creation)	26,251	2,995	0	29,246
C (enhancement)	0	0	41,530	41,530
D	6,590	0	0	6,590
Total	**53,324**	**2,995**	**41,530**	**97,849**

1. All values in table are area in square feet.
2. Cowardin et al. (1979) wetland classification system:
PFO1E = palustrine forested, broad-leaved deciduous, seasonally saturated
PSS1E = palustrine scrub/shrub, broad-leaved deciduous, seasonally saturated
PEM5E = palustrine emergent, narrow-leaved persistent, seasonally saturated
PEM3E = palustrine emergent, narrow-leaved non-persistent, seasonally saturated

Table 3. Mitigation Plantings						
Mitigation Area	**A**	**B**	**C1 (creation)**	**C2 (creation)**	**C3 (enhancement)**	**D**
Area (square feet)	7,838	12,645	26,251	2,995	41,530	6,590
	PFO1	PFO1	PFO1	PSS1	PEM	PFO1
Design Functions (**)	GR, FA, PR, WH, EV	GR, FA, PR, WH, EV	GR, FA, PR, WH, EV	GR, FA, PR, WH, EV	Wetland Enhancement	GR, FA, PR, WH, EV
Plantings						
Trees						
Acer rubrum	20	35	65			20
Fraxinus pensylvanica	20	30	65			15
Nyssa sylvatica	20	30	65			15
Quercus palustris	20	30	65			15
Total Trees	***80***	***125***	***260***	***0***	***0***	***65***
Shrubs						
Alnus rugosa	55		105	10	12	30
Clethra alnifolia	55		70	10	12	30
Cornus amomum		75	70	10	12	
Cornus sericea			70	10	12	30
Ilex verticillata		70	70	10	12	
Rosa palustris	55		70	10	12	35
Sambucus canadensis	55		70	10	12	
Spiraea latifolia		70	70	10	12	30
Vaccinium corymbosum		70	70	10	12	30
Viburnum dentatum		70	70	10	12	
Total Shrubs	***220***	***355***	***735***	***100***	***120 (*)***	***185***
Herbaceous						
Acorus calamus	100		290		100	
Alisma plantago-aquatica	60		290			
Asclepias incarnata		140		55	100	100
Aster novae-angliae	100	140		55	100	
Carex crinita			290		100	100
Carex lurida		140			100	125
Carex stricta	100		290	55	100	
Carex vulpinoidea			290			100
Eleocharis palustris		140	290			
Eupatorium maculatum	100	140		55	100	
Iris versicolor	100	140			100	
Juncus canadensis		140	290	55	100	
Juncus effusus	100					100
Onoclea sensibilis		140	290			
Scirpus atrovirens		140	290		100	100
Scirpus cyperinus	100		290		100	100
Verbena hastata	100	130		55	100	
Total Herbaceous	**860**	**1390**	**2,900**	**330**	**1200**	**725**

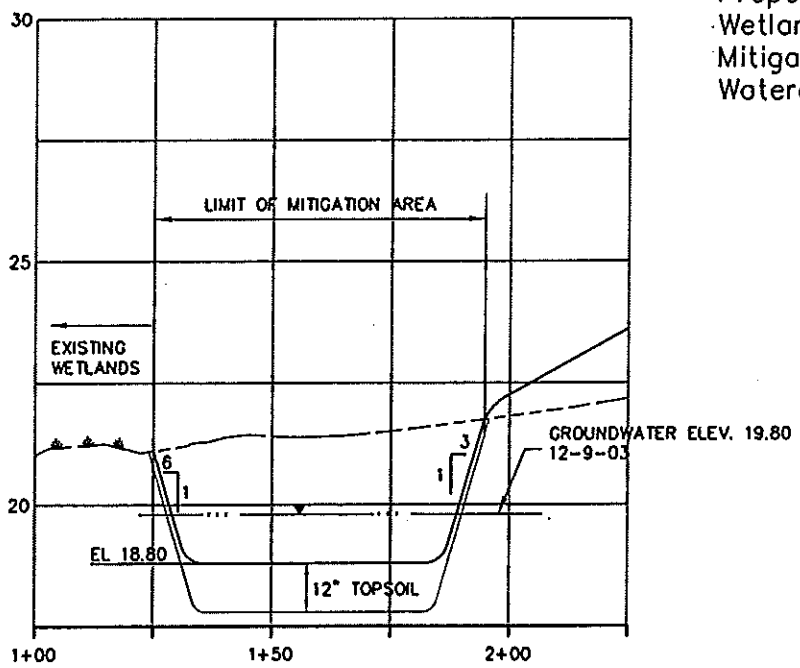
Note:
1. Plant materials available from New England Wetland Plants, Inc. (413-256-1752), or equal.
2. All Areas (except C3) will be seeded with New England WetMix at a rate of 1 pound/2,500 square feet, or equal.
(*) Shrubs in Area C3 will be planted in two staggered rows along east edge of wetland.
(**) GR=Groundwater Recharge, FA=Floodflow Alteration, PR=Pollutant Removal, WH=Wildlife Habitat, EV=Educational Value

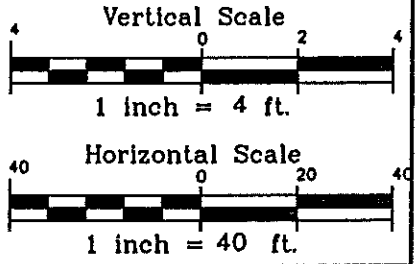
APPPENDIX 1. MITIGATION PLANS PREPARED BY HRP ASSOCIATES, INC.



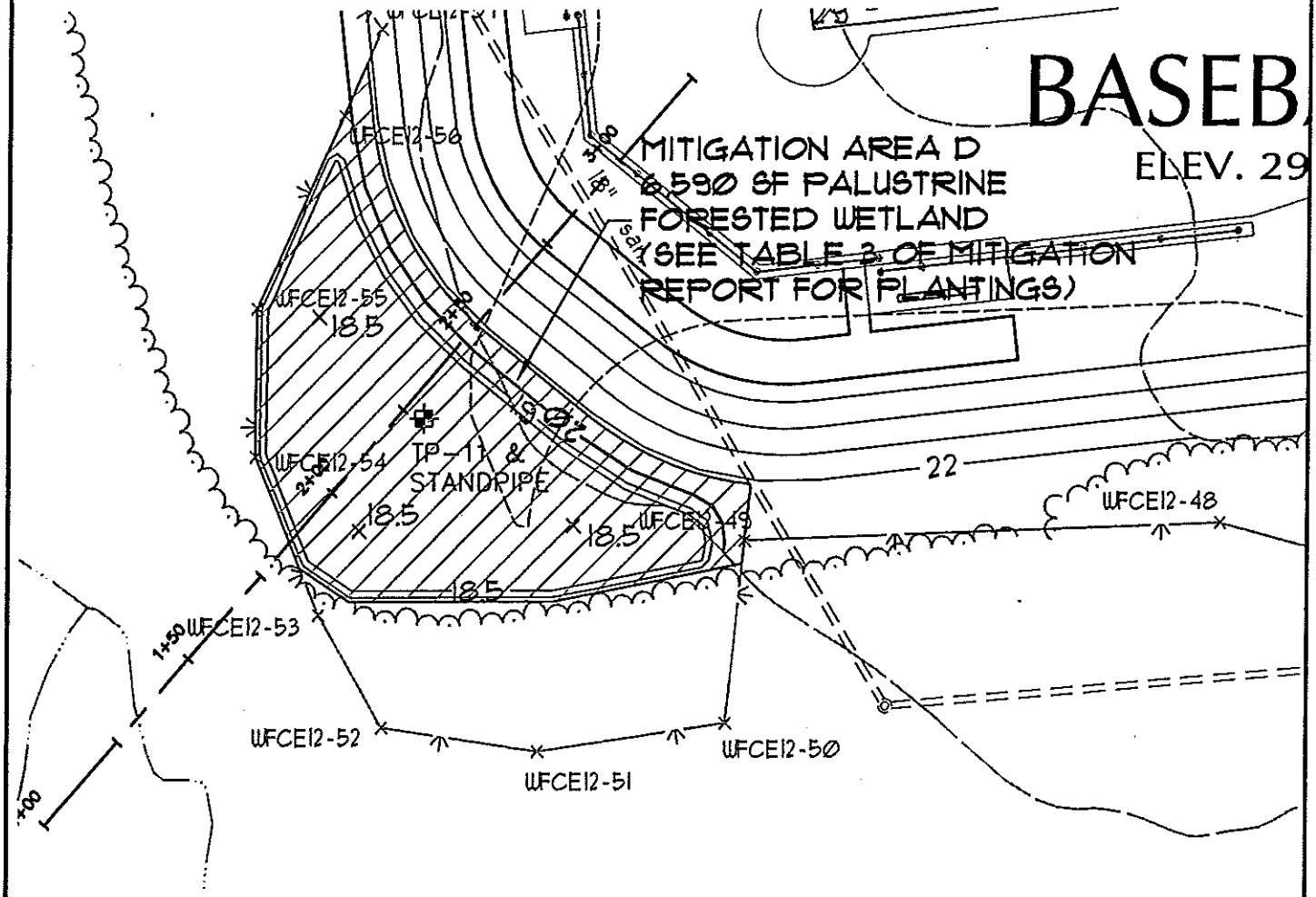
LEGEND

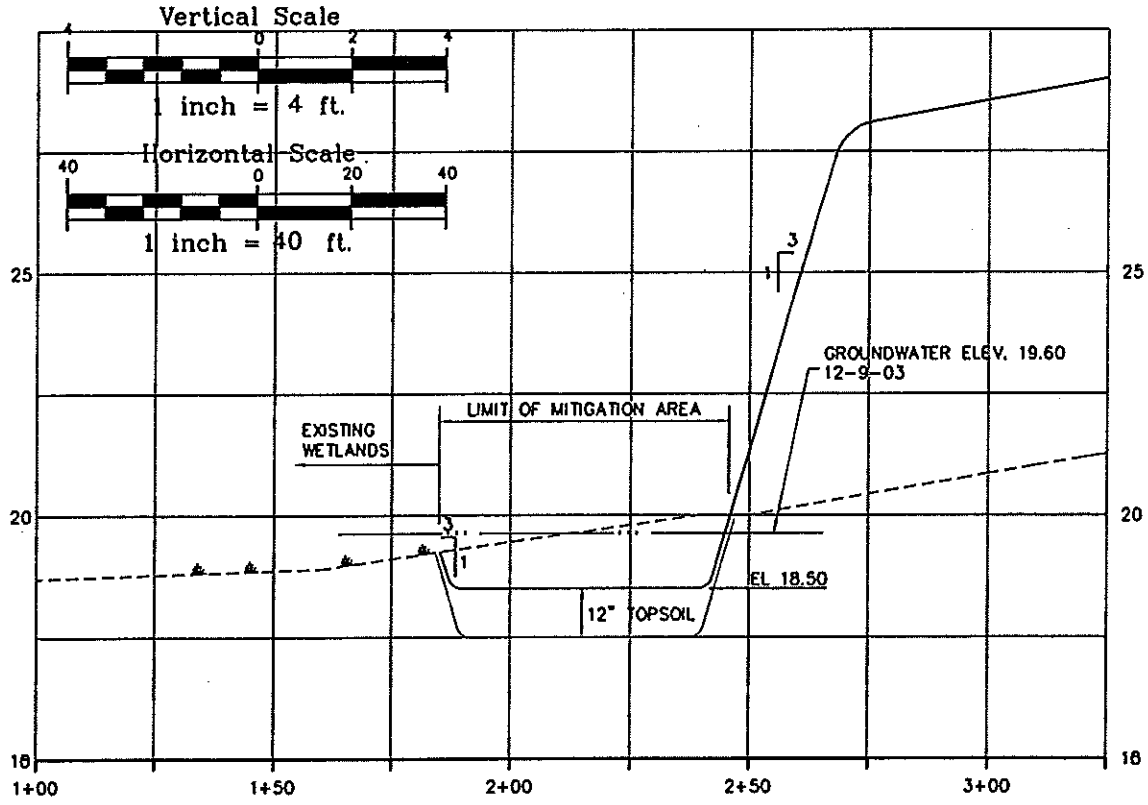
Existing Contour	------20------
Proposed Contour	——20——
Proposed Spot Grade	21.5
Wetland Limit	
Mitigation Area	
Watercourse	



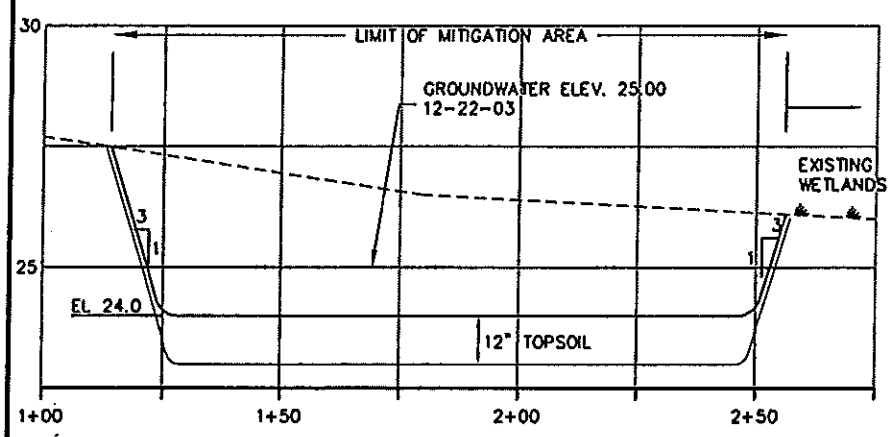


HRP ASSOCIATES, INC. Environmental/Civil Engineering and Hydrogeology Plainville, CT 06062	MIDDLETOWN HIGH SCHOOL & VO-AG CENTER MITIGATION AREA A	DATE JULY 22, 2004
	APPLICANT: MIDDLETOWN HIGH SCHOOL BUILDING COMMITTEE	HRP PROJECT NO. DEC0004.WM 1/4





HRP ASSOCIATES, INC. Environmental/Civil Engineering and Hydrogeology Plainville, CT 06062	MIDDLETOWN HIGH SCHOOL & VO-AG CENTER MITIGATION AREA D	DATE DECEMBER 22, 2003
	APPLICANT: MIDDLETOWN HIGH SCHOOL BUILDING COMMITTEE	HRP PROJECT NO. DEC0002.PC 4/4



Profile Scale
Vert. Scale: 1 inch = 4 ft.
Horiz. Scale: 1 inch = 40 ft.

WETLAND ENHANCEMENT
MITIGATION AREA C
41,530 SF ADDITIONAL
PALUSTRINE EMERGENT
WETLAND

PLANT TWO ROWS SIX FEET ON CENTER ALONG PROPERTY LINE TO EXISTING EDGE OF WOODS. PLANT A MIX OF THE TEN SHRUB SPECIES LISTED IN TABLE 3.

NOTE:
NO MOWING IS ALLOWED IN WETLAND ENHANCEMENT AREA SEE TABLE 3 OF MITIGATION REPORT FOR PLANTINGS

WETLAND CREATION
MITIGATION AREA C
2,995 SF PALUSTRINE
SCRUB-SHRUB WETLAND

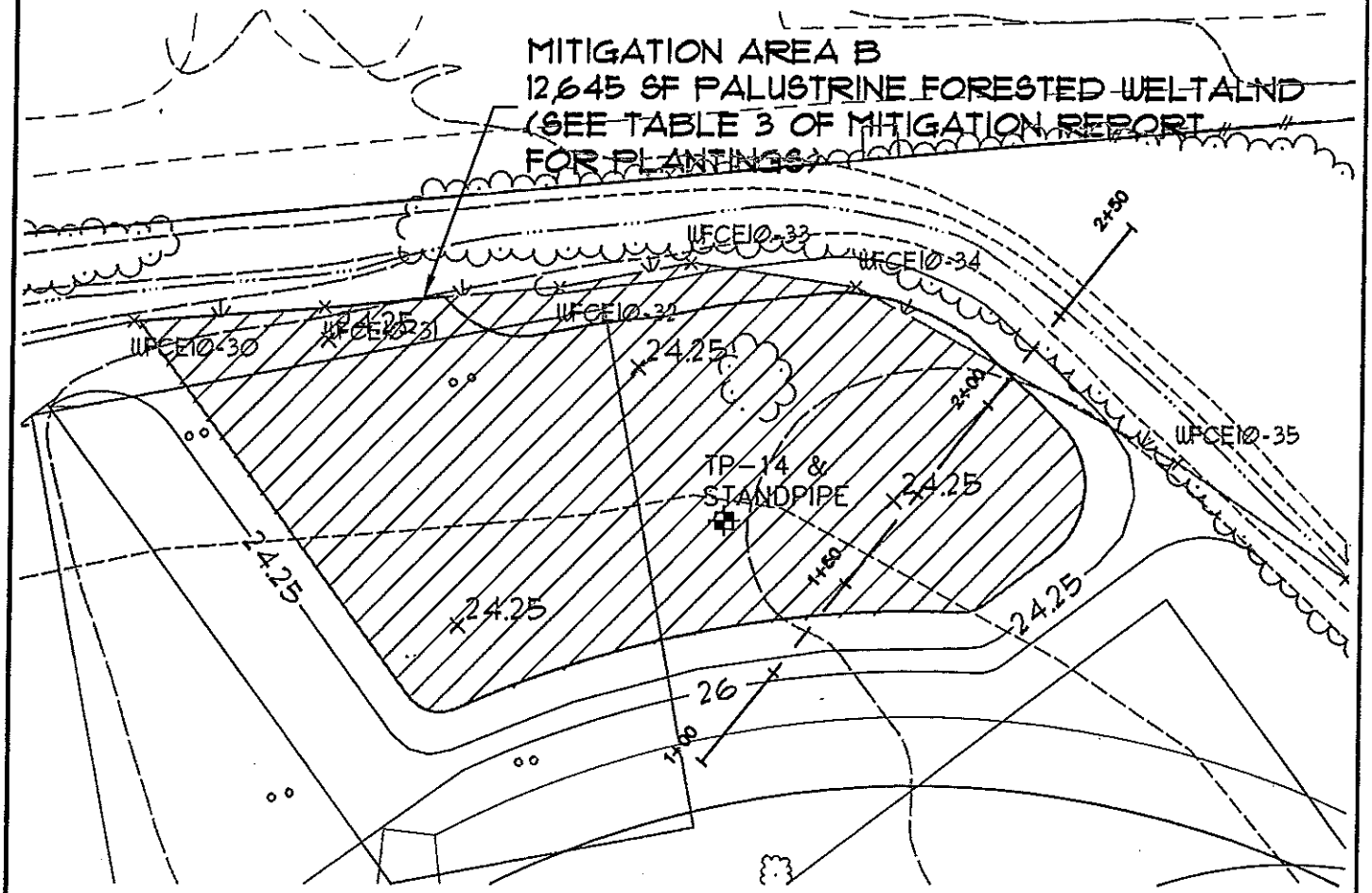
WETLAND CREATION
MITIGATION AREA C
26,251 SF PALUSTRINE
FORESTED WETLAND

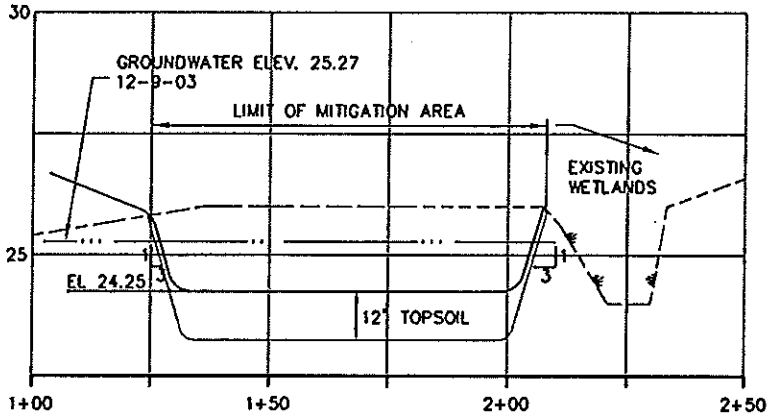
Plan Scale
1 inch = 50 ft.

TP-12
STANDPIPE ONLY
(INSTALLED BY HAND ON 12/12/03)

WFCE10-40
WFCE10-41
WFCE10-42
WFCE10-51
WFCE10-50

HRP ASSOCIATES, INC. Environmental/Civil Engineering and Hydrogeology Plainville, CT 06062	MIDDLETOWN HIGH SCHOOL & VO-AG CENTER MITIGATION AREA C	DATE: JULY 22, 2004
	APPLICANT: MIDDLETOWN HIGH SCHOOL BUILDING COMMITTEE	HRP PROJECT NO. DEC0004.WM





Vertical Scale

4 0 2 4

1 inch = 4 ft.

Horizontal Scale

40 0 20 40

1 inch = 40 ft.

HRP ASSOCIATES, INC. Environmental/Civil Engineering and Hydrogeology Plainville, CT 06062	MIDDLETOWN HIGH SCHOOL & VO-AG CENTER MITIGATION AREA B	DATE JULY 22, 2004
	APPLICANT: MIDDLETOWN HIGH SCHOOL BUILDING COMMITTEE	HRP PROJECT NO. DEC0004.WM 2/4

APPENDIX 2. TEST PIT DATA COLLECTED BY HRP ASSOCIATES, INC.

TEST PIT # TP-3A

TEST PIT LOG

HRP Associates, Inc.

167 PROPOSED BRITAIN AVENUE

PLAINVILLE, CONNECTICUT 06062

Project/Client:

Location: Proposed Middletown High School

Job No.: DEC0002.GT, T02

Date: 11/24/03

Photos Taken: #2, #3

Excavator Type: John Deere 310C

Contractor: B&M Excavating

Ground Water Level (if observed): see below

No. Samples Taken: 2

PID: —

Sample Storage: —

Geologist/Technician: JMC

TEST PIT LOCATION SKETCH MAP

See Figure

Test Pit Location Description:

Proposed wetland Mitigation Area

Sample Number	Depth From Surface (feet) From	To	Sample Location Within Test Pit	Sample Type	Moisture	Remarks (color, structure, grain size, staining, odor, PID)
	0	0.3			SM	Brown silt and sand, vegetation (topsoil)
TP-3 Fill	0.3	2.0		Bucket	SM	Brown silt, some clay, trace m-vf sand (fill)
TP-3 Br. Clay	2.0	8.5		Bucket	SM	Brown clay
						END OF TEST PIT @ 8.5' b.g.
						No infiltrating ground water observed.
						~0.3' process stone placed in pit bottom. Installed 10' section of Schedule 40 PVC (4" D) with screw cap.
						Backfilled to grade and covered with hay.

SAMPLE TYPE

Bucket = Excavator Bucket
G = Grab
HA = Hand Auger
Comp = Composite Sample
GW = Ground Water

MOISTURE

D = Dry
VM = Very Moist
SM = Slightly Moist
W = Wet (saturated)

PROPORTIONS USED

0 – 10% Trace
10 – 20% Little
20 – 35% Some
35 – 50% And

J\DECAD\test pit logs

TEST PIT # TP-10

TEST PIT LOG

HRP Associates, Inc.

167 PROPOSED BRITAIN AVENUE

PLAINVILLE, CONNECTICUT 06062

Project/Client:

Location: Proposed Middletown High School

Job No.: DEC0002.GT, T02

Date: 11/24/03

Photos Taken: ---

Excavator Type: John Deere 310C

Contractor: B&M Excavating

Ground Water Level (if observed): see below

No. Samples Taken: 2

PID: ---

Sample Storage: ---

Geologist/Technician: JMC

TEST PIT LOCATION SKETCH MAP

See Figure

Test Pit Location Description:

Proposed Wetland Mitigation Area

Sample Number	Depth From Surface (feet) From	To	Sample Location Within Test Pit	Sample Type	Moisture	Remarks (color, structure, grain size, staining, odor, PID)
	0	0.3			SM	Brown silt and m-vf sand, trace vegetation (topsoil)
	0.3	2.4			SM	Brown silt and clay, trace m-vf sand, trace cobble, trace gravel, trace organics
TP-10 Org. Clay	2.4	4.3			SM	Brown-dark gray silt and organic clay, little organics
TP-10 Gray Clay	4.3	5.6			SM	Dark gray organic clay, some organics
TP-10 Br. Clay	5.6	7.6			SM	Brown clay
						END OF TEST PIT @ 7.6' b.g.
						Perched ground water at 2.4', 4.3' b.g.
						~0.3' process stone placed in pit bottom. Installed 10' section of 4"-diameter Schedule 40 PVC with screw cap.
						Backfilled to grade and covered with hay.

SAMPLE TYPE

Bucket = Excavator Bucket
G = Grab
HA = Hand Auger
Comp = Composite Sample
GW = Ground Water

MOISTURE

D = Dry
VM = Very Moist
SM = Slightly Moist
W = Wet (saturated)

PROPORTIONS USED

0 – 10% Trace
10 – 20% Little
20 – 35% Some
35 – 50% And

J\DECAD\test pit logs

TEST PIT # TP-11

TEST PIT LOG

HRP Associates, Inc.

167 PROPOSED BRITAIN AVENUE

PLAINVILLE, CONNECTICUT 06062

Project/Client:

Location: Proposed Middletown High School

Job No.: DEC0002.GT, T02

Date: 11/24/03

Photos Taken: ---

Excavator Type: John Deere 310C

Contractor: B&M Excavating

Ground Water Level (if observed): see below

No. Samples Taken: --

PID: ---

Sample Storage: ---

Geologist/Technician: JMC

TEST PIT LOCATION SKETCH MAP

See Figure

Test Pit Location Description:

Proposed Wetland Mitigation Area

Sample Number	Depth From Surface (feet)		Sample Location Within Test Pit	Sample Type	Moisture	Remarks (color, structure, grain size, staining, odor, PID)
	From	To				
	0	0.5			SM	Dark brown loamy silt and m-vf sand, trace vegetation.
	0.5	7.0			SM	Brown clay
						END OF TEST PIT @ 7.0' b.g.
						~0.3' process stone placed in pit bottom. Installed 10' section of 4"-diameter Schedule 40 PVC with screw cap.
						Backfilled to grade and covered with hay.

SAMPLE TYPE

Bucket = Excavator Bucket
G = Grab
HA = Hand Auger
Comp = Composite Sample
GW = Ground Water

MOISTURE

D = Dry
SM = Slightly Moist
VM = Very Moist
W = Wet (saturated)

PROPORTIONS USED

0 – 10% Trace
10 – 20% Little
20 – 35% Some
35 – 50% And

TEST PIT # TP-13

TEST PIT LOG

HRP Associates, Inc.

167 PROPOSED BRITAIN AVENUE

PLAINVILLE, CONNECTICUT 06062

Project/Client:
Location: Proposed Middletown High School
Job No.: DEC0002.GT, T02
Date: 11/24/03
Photos Taken: ---
Excavator Type: John Deere 310C
Contractor: B&M Excavating
Ground Water Level (if observed): —
No. Samples Taken: 2
PID: ---
Sample Storage: ---
Geologist/Technician: JMC

TEST PIT LOCATION SKETCH MAP

See Figure

Test Pit Location Description:
Proposed Wetland Mitigation Area

Sample Number	Depth From Surface (feet) From	To	Sample Location Within Test Pit	Sample Type	Moisture	Remarks (color, structure, grain size, staining, odor, PID)
	0	0.3			SM	Brown silt and m-vf sand, trace clay (topsoil)
	0.3	2.5			SM	Brown silt and clay, trace m-vf sand (fill)
	2.5	7.6			SM	Brown clay
						END OF TEST PIT @ 7.6' b.g.
						No perched ground water infiltration observed.
						~0.3' process stone placed in pit bottom. Installed 10' section of 4"-diameter Schedule 40 PVC with screw cap.
						Backfilled to grade and covered with hay.

SAMPLE TYPE

Bucket = Excavator Bucket
G = Grab
HA = Hand Auger
Comp = Composite Sample
GW = Ground Water

MOISTURE

D = Dry
SM = Slightly Moist
VM = Very Moist
W = Wet (saturated)

PROPORTIONS USED

0 – 10% Trace
10 – 20% Little
20 – 35% Some
35 – 50% And

TEST PIT # TP-14

TEST PIT LOG

HRP Associates, Inc.

167 PROPOSED BRITAIN AVENUE

PLAINVILLE, CONNECTICUT 06062

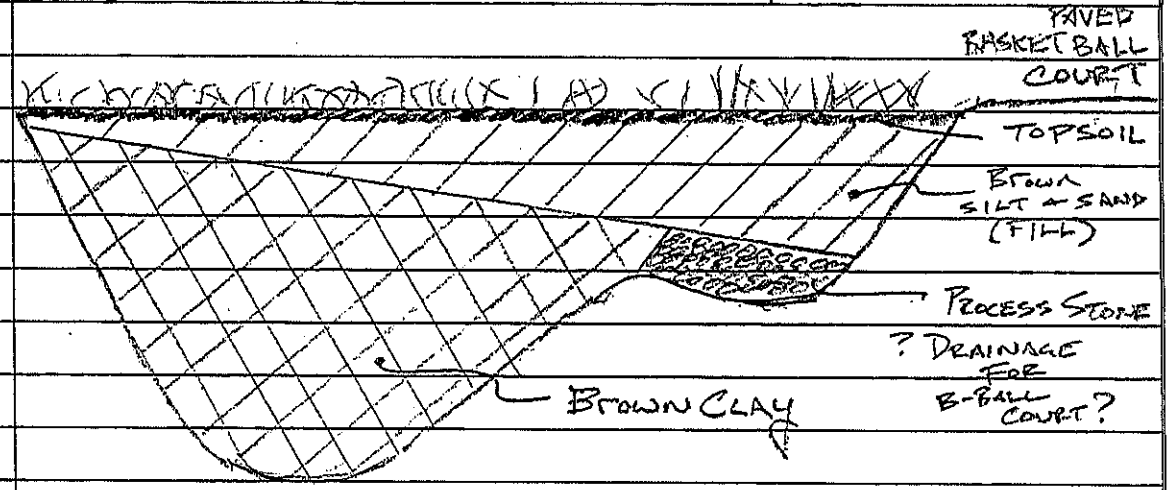
Project/Client:
Location: Proposed Middletown High School
Job No.: DEC0002.GT, T02
Date: 11/24/03
Photos Taken: #10, #11
Excavator Type: John Deere 310C
Contractor: B&M Excavating
Ground Water Level (if observed): see below
No. Samples Taken: --
PID: ---
Sample Storage: ---
Geologist/Technician: JMC

TEST PIT LOCATION SKETCH MAP

See Figure

Test Pit Location Description:
Proposed Wetland Mitigation Area

Sample Number	Depth From Surface (feet) From	To	Sample Location Within Test Pit	Sample Type	Moisture	Remarks (color, structure, grain size, staining, odor, PID)
			TEST PIT	PROFILE:		
					GRADE	
					-2'	
					-4'	
					-6'	
					-8'	
						~0.3' process stone placed in pit bottom. Installed 10' section of 4"-diameter Schedule 40 PVC with screw cap.
						Backfilled to grade and covered with hay.



SAMPLE TYPE

Bucket = Excavator Bucket
G = Grab
HA = Hand Auger
Comp = Composite Sample
GW = Ground Water

MOISTURE

D = Dry
SM = Slightly Moist
VM = Very Moist
W = Wet (saturated)

PROPORTIONS USED

0 – 10% Trace
10 – 20% Little
20 – 35% Some
35 – 50% And

APPENDIX 3. ARMY CORPS DATA SHEETS

PROJECT TITLE: *Middletown High School* TRANSECT: *1* PLOT: *U*
DELINEATOR: *Edward M. Pawlak, PWS* DATE: *8/14/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Shrubs	*Rosa multiflora*	38/75	51%	FACU
Herbs	*Solidago sp.*	10.5/24	44%	FACU
	Grasses	10.5/24	44%	---

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL	FACW	FAC	Other Hydrophytes	FAC-	2 FACU	UPL

Hydrophytes Subtotal: 0___ Non-hydrophytes Subtotal: 2___

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 0/2=0%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate — Identification:
- Aerial photograph — Identification:
- Other — Identification:

___ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-20	A	7.5R 3/3	---	

HYDRIC SOIL INDICATOR(S):

REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data

Taxonomic Subgroup:

Soil Drainage Class:

Depth to Active Water Table:

NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? No Is this datapoint a wetland? No

Hydric Soils Criterion Met? NO

Wetland Hydrology Met? NO

Remarks/Plot Location: Plot is located 27 feet on a 290 degree bearing from Plot 1W.

PROJECT TITLE: *Middletown High School* TRANSECT: 1 PLOT: U

PROJECT TITLE: *Middletown High School* TRANSECT: *1* PLOT:*W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/14/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Shrubs	*Cornus amomum*	20.5/47.5	43	FACW
	Lonicera tartarica	10.5/47.5	22	FACU
	Fraxinus Americana	10.5/47.5	22	FACU
Herbs	*Lythrum salicaria*	38/85	45	FACW+
	Carex lurida	38/85	45	OBL

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

_1___ _2___ _____ _____ _____ 2____ _____
OBL FACW FAC Other Hydrophytes FAC- FACU UPL

Hydrophytes Subtotal: 3____ Non-hydrophytes Subtotal: 2____

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 3/5=60%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate — Identification:
- Aerial photograph — Identification:
- Other — Identification:

_x__ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-5	A	7.5YR 3/1		Fine sandy loam; moist
5-20	B	7.5YR 4/2	7.5YR 4/6 mottles	Fine sandy loam; moist

HYDRIC SOIL INDICATOR(S): IIID

REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? yes
Hydric Soils Criterion Met? yes
Wetland Hydrology Met? yes

Is this datapoint a wetland? yes

Remarks/Plot Location: Plot is located 15' on a 114 degree bearing from flag 17-8.

PROJECT TITLE: *Middletown High School* TRANSECT: 1 PLOT: W

PROJECT TITLE: *Middletown High School* TRANSECT:*2* PLOT:*U*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/15/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Quercus rubra*	390/879	44%	FACU-
	Acer rubrum	190/879	22%	FAC
	Quercus palustris	299/879	34%	FACW
Saplings	*Acer rubrum*	3/13.5	22%	FAC
	Ostrya virginiana	10.5/13.5	78%	FACU-
Shrubs	*Ilex verticillata*	10.5/16.5	64%	FACW+
Herbs	*Toxicodendron radicans*	38/38	100%	FAC

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW:2 FAC:3 Other Hydrophytes: FAC-: FACU:2 UPL:

Hydrophytes Subtotal: Non-hydrophytes Subtotal:

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 5/7=71%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate — Identification:
- Aerial photograph — Identification:
- Other — Identification:

__x_ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-10	A	7.5YR 3/2		Fine sandy loam
10-20	B	5YR 4/4		Fine sandy loam

HYDRIC SOIL INDICATOR(S):
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? yes
Hydric Soils Criterion Met? no
Wetland Hydrology Met? no

Is this datapoint a wetland? no

Remarks/Plot Location: Plot is located 24 feet on a 202 degree bearing from Plot 2W.

PROJECT TITLE: *Middletown High School* TRANSECT:2 PLOT:U

PROJECT TITLE: *Middletown High School* TRANSECT:*2* PLOT:*W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/15/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	Quercus palustris	1652/1947	85%	FACW
Shrubs	Cephalanthus occidentalis	20.5/23/5	87%	OBL

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL:1 FACW:1 FAC: Other Hydrophytes: FAC-: FACU: UPL:

Hydrophytes Subtotal: 2 Non-hydrophytes Subtotal:0

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 2/2=100%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

_x__ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits __x_ Drainage Patterns in Wetland ___ Other:

SOIL
Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-12	A1	10YR 2/1	Oxidized rhizospheres	Fine sandy loam
12-18	A2	10YR 3/1		Fine sandy loam
18+	B	10YR 4/1		Fine sandy loam

HYDRIC SOIL INDICATOR(S): IIIE
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS
Greater than 50% Hydrophytes? yes
Hydric Soils Criterion Met? yes
Wetland Hydrology Met? yes

Is this datapoint a wetland? yes

Remarks/Plot Location: Plot is located 15' on a 68 degree bearing from flag 3-1.

PROJECT TITLE: *Middletown High School* TRANSECT: 2 PLOT: W

PROJECT TITLE: *Middletown High School* TRANSECT:*3* PLOT:*U*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/15/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Carya sp.*	552/814	58%	FACU
Saplings	*Carpinus caroliniana*	10.5/52	20%	FAC
	Acer rubrum	10.5/52	20%	FAC
	Carya sp.	10.5/52	20%	FACU
Shrubs	*Fraxinus Americana*	3/3	100%	FACU
Herbs	*Acer saccharum*	3/9	33%	FACU
	Parthenocissus quinquefolia	3/9	33%	FACU
	Arisaema triphyllum	3/9	33%	FACW-

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW:1 FAC:2 Other Hydrophytes: FAC-: FACU:5 UPL:

Hydrophytes Subtotal:3 Non-hydrophytes Subtotal:5

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 3/8=38%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

_x__ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL
Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-6	A	5YR 4/4		Fine sandy loam
6-20	B	5YR 4/6		Fine sandy loam

HYDRIC SOIL INDICATOR(S):
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS
Greater than 50% Hydrophytes? no
Hydric Soils Criterion Met? no
Wetland Hydrology Met? no

Is this datapoint a wetland? no

Remarks/Plot Location: Plot is located 30 feet on a 134 degree bearing from Plot 3W.

PROJECT TITLE: *Middletown High School* TRANSECT: 3 PLOT: U

PROJECT TITLE: *Middletown High School* TRANSECT:*3* PLOT:*W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/15/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Fagus grandifolia*	299/1123	27%	FACU
	Carya ovata	299/1123	27%	FACU
	Carya sp.	454/1123	40%	FACU
Herbs	*Toxicodendron radicans*	3/6	50%	FAC
	Parthenocissus quinquefolia	3/6	50%	FACU

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: FAC:1 Other Hydrophytes: FAC-: FACU:4 UPL:

Hydrophytes Subtotal: Non-hydrophytes Subtotal:

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 1/5=20%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

__x_ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water: 12"
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated __x_ Saturated in upper 12" _x_ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL
Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-9	A	7.5YR 4/2		Silt loam; moist
9-14	B1	7.5YR 5/3		Silt loam; saturated
14-20	B2	5YR 5/4	10YR 4/6 mottles abundant	Silt loam; saturated

HYDRIC SOIL INDICATOR(S): IV
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS
Greater than 50% Hydrophytes? No
Hydric Soils Criterion Met? Yes
Wetland Hydrology Met? Yes

Is this datapoint a wetland? Yes

Remarks/Plot Location: Plot is located 12 feet on a 314 degree bearing from flag 4-1.

PROJECT TITLE: *Middletown High School* TRANSECT: 3 PLOT: W

PROJECT TITLE: *Middletown High School* TRANSECT:*4* PLOT:*U*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/15/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Carya sp.*	624/672	93%	FACU
Saplings	*Carpinus caroliniana*	10.5/13.5	78%	FAC
	Ostrya virginiana	3/13.5	22%	FACU
Shrubs	*Prunus serotina*	10.5/21	50%	FACU
	Acer saccharum	10.5/21	50%	FACU
Herbs	*Acer saccharum*	10.5/37.5	28%	FACU
	Viola sp.	10.5/37.5	28%	---
	Prunus serotina	10.5/37.5	28%	FACU

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: FAC:1 Other Hydrophytes: FAC-: FACU:6 UPL:

Hydrophytes Subtotal:1 Non-hydrophytes Subtotal:6

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 1/7=14%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

__x_ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-6	A	5YR 4/3		Fine sandy loam
6-20	B	5YR 4/4		Fine sandy loam

HYDRIC SOIL INDICATOR(S):
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? no
Hydric Soils Criterion Met? no
Wetland Hydrology Met? no

Is this datapoint a wetland? no

Remarks/Plot Location: Plot is located 15 feet on a 132 degree bearing from Plot 4W.

PROJECT TITLE: *Middletown High School* TRANSECT: 4 PLOT:U

PROJECT TITLE: *Middletown High School* TRANSECT:*4* PLOT:*W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/15/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Ostrya virginiana*	24/112	21%	FACU
	Acer rubrum	44/112	39%	FAC
	Carya sp.	44/112	39%	FACU
Saplings	*Ostrya virginiana*	10.5/21	50%	FACU
	Carpinus caroliniana	10.5/21	50%	FAC
Shrubs	*Viburnum dentatum*	3/6	50%	FACW-
	Fraxinus Americana	3/6	50%	FACU
Herbs	*Onoclea sensibilis*	3/9	33%	FACW
	Parthenocissus quinquefolia	3/9	33%	FACU
	Fraxinus americana	3/9	33%	FACU

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW:2 FAC:2 Other Hydrophytes: FAC-: FACU:6 UPL:

Hydrophytes Subtotal:4 Non-hydrophytes Subtotal:6

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes =4/10=40%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

_x__ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water: 16"
- Depth to Saturation (including capillary fringe): 9"
- Describe Altered Hydrology:

___ Inundated __x_ Saturated in upper 12" _x_ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL
Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-9	A	10YR 2/1		Fine sandy loam; moist
9-20	B	5YR 4/4	10YR 4/6 mottles abundant	Fine sandy loam; saturated

HYDRIC SOIL INDICATOR(S): IV
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS
Greater than 50% Hydrophytes? no
Hydric Soils Criterion Met? yes
Wetland Hydrology Met? yes

Is this datapoint a wetland? yes

Remarks/Plot Location: Plot is located 12 feet on a 358 degree bearing from flag 5-7.

PROJECT TITLE: *Middletown High School* TRANSECT:4 PLOT:W

PROJECT TITLE: *Middletown High School* TRANSECT: *5* PLOT: *U*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/15/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Fagus grandifolia*	434/2111	21%	FACU
	Carya sp.	687/2111	32%	FACU
	Quercus rubra	990/2111	47%	FACU-
Saplings	*Fagus grandifolia*	20.5/34	60%	FACU
	Acer saccharum	10.5/34	31%	FACU
Shrubs	*Fagus grandifolia*	3/13.5	22%	FACU
	Acer saccharum	10.5/13.5	78%	FACU
Herbs	*Acer saccharum*	3/3	100%	FACU

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: FAC: Other Hydrophytes: FAC-: FACU: 8 UPL:

Hydrophytes Subtotal: 0 Non-hydrophytes Subtotal: 8

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 0/8=0%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

__x_ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-12	A	10YR 3/2		Fine sandy loam
12-20	B	10YR 4/4		Fine sandy loam

HYDRIC SOIL INDICATOR(S):
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? no
Hydric Soils Criterion Met? no
Wetland Hydrology Met? no

Is this datapoint a wetland? no

Remarks/Plot Location: Plot is located 24 feet on a 128 degree bearing from Plot 5W.

PROJECT TITLE: *Middletown High School* TRANSECT: 5 PLOT: U

PROJECT TITLE: *Middletown High School* TRANSECT: *6* PLOT: *W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/25/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Acer rubrum*	188/423	44%	FAC
	Carya ovata	143/423	34%	FACU
Saplings	*Carpinus caroliniana*	63/73.5	86%	FAC
Shrubs	*Ilex verticillata*	38/44	86%	FACW+
Herbs	*Arisaema triphyllum*	3/6	50%	FACW-
	Parthenocissus quinquefolia	3/6	50%	FACU

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: 2 FAC: 2 Other Hydrophytes: FAC-: FACU: 2 UPL:

Hydrophytes Subtotal: 4 Non-hydrophytes Subtotal: 2

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 4/6=67%

HYDROLOGY

___ RECORDED DATA

Stream, lake or tidal gate Identification:
Aerial photograph Identification:
Other Identification:

__x_ NO RECORDED DATA

___ OBSERVATIONS:

Depth to Free Water: 13"
Depth to Saturation (including capillary fringe):
Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" _x__ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-10	A	10YR 3/1	Oxidized rhizospheres	Silt loam; moist
10-20	C	10YR 6/1	10YR 5/6 mottles abundant	Silt loam; moist

HYDRIC SOIL INDICATOR(S): IIID

REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? yes
Hydric Soils Criterion Met? yes
Wetland Hydrology Met? yes

Is this datapoint a wetland? yes

Remarks/Plot Location: Plot is located 15 feet on a 322 degree bearing from flag 7-2.

PROJECT TITLE: *Middletown High School* TRANSECT: 6 PLOT: W

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-8	A	5YR 4/3		Silt loam
8-20	B	5YR 4/4		Silt loam

HYDRIC SOIL INDICATOR(S):

REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data

Taxonomic Subgroup:

Soil Drainage Class:

Depth to Active Water Table:

NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? no

Hydric Soils Criterion Met? no

Wetland Hydrology Met? no

Is this datapoint a wetland? no

Remarks/Plot Location: Plot is located 15feet on a 168 degree bearing from Plot 7W.

PROJECT TITLE: *Middletown High School* TRANSECT: 7 PLOT: U

PROJECT TITLE: *Middletown High School* TRANSECT: *7* PLOT: *W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/25/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Carya ovata*	780/1036	75%	FACU
	Acer rubrum	212/1036	20%	FAC
Saplings	*Acer saccharum*	38/48.5	78%	FACU
	Carpinus caroliniana	10.5/48.5	22%	FAC
Shrubs	*Carpinus caroliniana*	3/6	50%	FAC
	Fraxinus americana	3/6	50%	FACU

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: FAC: 3 Other Hydrophytes: FAC-: FACU: 3 UPL:

Hydrophytes Subtotal: 3 Non-hydrophytes Subtotal: 3

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 3/6=50%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

_x__ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water: 10"
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-7	A	10YR 2/1		Silt loam; moist
7-20	C	10YR 3/1		Silt loam; moist

HYDRIC SOIL INDICATOR(S): IIID

REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? no
Hydric Soils Criterion Met? yes
Wetland Hydrology Met? yes

Is this datapoint a wetland? yes

Remarks/Plot Location: Plot is located 9 feet on a 342 degree bearing from flag 8-4.

PROJECT TITLE: *Middletown High School* TRANSECT: 7 PLOT: W

PROJECT TITLE: *Middletown High School* TRANSECT:*8* PLOT: *U*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/25/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Acer rubrum*	570/614	93%	FAC
Shrubs	*Prunus serotina*	20.5/34	60%	FACU
	Lindera benzoin	10.5/34	31%	FACW

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: 1 FAC: 1 Other Hydrophytes: FAC-: FACU: 1 UPL:

Hydrophytes Subtotal: 2 Non-hydrophytes Subtotal: 1

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 2/3=67%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

_x_ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL
Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-3	A	5YR 2.5/1		Fine sandy loam
3-20	B	5YR 4/4		Fine sandy loam

HYDRIC SOIL INDICATOR(S):
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS
Greater than 50% Hydrophytes? yes
Hydric Soils Criterion Met? no
Wetland Hydrology Met? no

Is this datapoint a wetland? no

Remarks/Plot Location: Plot is located 21 feet on a 162 degree bearing from Plot 8W.

PROJECT TITLE: *Middletown High School* TRANSECT: 8 PLOT: U

PROJECT TITLE: *Middletown High School* TRANSECT: *8* PLOT: *W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/25/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Acer rubrum*	499/567	88%	FAC
Saplings	*Acer rubrum*	38/38	100%	FAC
Shrubs	*Lindera benzoin*	38/59	64%	FACW

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: 1 FAC: 2 Other Hydrophytes: FAC-: FACU: UPL:

Hydrophytes Subtotal: 3 Non-hydrophytes Subtotal:

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 3/3=100%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

___ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water: >18"
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" _x__ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-6	A	5YR 4/3		Silt loam
6-20	B	5YR 3/3		Silt loam

HYDRIC SOIL INDICATOR(S): IV

REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? yes
Hydric Soils Criterion Met? yes
Wetland Hydrology Met? yes

Is this datapoint a wetland? yes

Remarks/Plot Location: Plot is located 12 feet on a 0 degree bearing from flag 9-4.

PROJECT TITLE: *Middletown High School* TRANSECT: 8 PLOT: W

PROJECT TITLE: *Middletown High School* TRANSECT: *9* PLOT: *U*
DELINEATOR: *Edward M. Pawlak, PWS* DATE: *8/25/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Quercus rubra*	990/1308	76%	FACU
Saplings	*Carpinus caroliniana*	20.5/41	50%	FAC
	Acer saccharum	20.5/41	50%	FACU
Shrubs	*Lonicera tartarica*	63/85.5	74%	FACU
Herbs	*Arisaema triphyllum*	20.5/69	30%	FACW-
	Lonicera tartarica	38/69	55%	FACU

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: 1 FAC: 1 Other Hydrophytes: FAC-: FACU: 4 UPL:

Hydrophytes Subtotal: 2 Non-hydrophytes Subtotal: 4

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 2/6=33%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

__x_ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-7	A	5YR 4/2		Fine sandy loam
7-20	B	5YR 4/4		Silt loam; manganese concretions

HYDRIC SOIL INDICATOR(S):

REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data

Taxonomic Subgroup:

Soil Drainage Class:

Depth to Active Water Table:

NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? no

Hydric Soils Criterion Met? no

Wetland Hydrology Met? no

Is this datapoint a wetland? no

Remarks/Plot Location: Plot is located 42 feet on a 36 degree bearing from Plot 9W.

PROJECT TITLE: *Middletown High School* TRANSECT: 9 PLOT: U

PROJECT TITLE: *Middletown High School* TRANSECT: *9* PLOT: *W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE:*8/25/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Trees	*Acer rubrum*	404/496	81%	FAC
Saplings	*Ulmus Americana*	38/48.5	78%	FACW-
	Acer rubrum	10.5/48.5	22%	FAC
Shrubs	*Lonicera tartarica*	63/85.5	74%	FACU
Herbs	*Arisaema triphyllum*	20.5/34	60%	FACW-
	Parthenocissus quinquefolia	10.5/34	31%	FACU

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: 2 FAC: 2 Other Hydrophytes: FAC-: FACU: 2 UPL:

Hydrophytes Subtotal: 4 Non-hydrophytes Subtotal: 2

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 4/6=67%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

___ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits __x_ Drainage Patterns in Wetland ___ Other:

SOIL
Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-10	A	5YR 3/2		Silt loam
10-20	B	5YR 4/3		Silt loam

HYDRIC SOIL INDICATOR(S): IV
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS
Greater than 50% Hydrophytes? yes
Hydric Soils Criterion Met? yes
Wetland Hydrology Met? yes

Is this datapoint a wetland? yes

Remarks/Plot Location: Plot is located 27 feet on a 230 degree bearing from flag 2-161.

PROJECT TITLE: *Middletown High School* TRANSECT: 9 PLOT: W

PROJECT TITLE: *Middletown High School* TRANSECT: *10* PLOT: *U*
DELINEATOR: *Edward M. Pawlak, PWS* DATE: *8/26/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Shrubs	*Rosa multiflora*	38/63	60%	FACU
Herbs	*Plantago lanceolata*	38/58.5	65%	NI (UPL)
	Trifolium pretense	20.5/58.5	35%	FACU-

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: FAC: Other Hydrophytes: FAC-: FACU: 2 UPL: 1

Hydrophytes Subtotal: 0 Non-hydrophytes Subtotal: 3

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 0/3=0%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

__x_ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits ___ Drainage Patterns in Wetland ___ Other:

SOIL
Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-20	A	10YR 4/4		Fine sandy loam; fill

HYDRIC SOIL INDICATOR(S):
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS
Greater than 50% Hydrophytes? no
Hydric Soils Criterion Met? no
Wetland Hydrology Met? no

Is this datapoint a wetland? no

Remarks/Plot Location: Plot is located 18 feet on a 220 degree bearing from Plot 10W.

PROJECT TITLE: *Middletown High School* TRANSECT: 10 PLOT: U

PROJECT TITLE: *Middletown High School* TRANSECT: *10* PLOT: *W*
DELINEATOR: *Edward M. Pawlak, PWS* DATE: *8/26/03*

VEGETATION				
Stratum	Species (Dominants Only)	Dominance Ratio	Percent Dominance	NWI Status
Shrubs	*Rosa multiflora*	10.5/21	50%	FACU
	Viburnum dentatum	10.5/21	50%	FACW-
Herbs	*Scirpus cyperinus*	63/100	63%	FACW+

Note 1: Use asterisk * to indicate plants with observed adaptations to wetland hydrology, which should be considered as "other hydrophytes" in the tally below.
Note 2: Species with NA or NI status are reported, but are not calculated in the tally below.

OBL: FACW: 2 FAC: Other Hydrophytes: FAC-: FACU: 1 UPL:

Hydrophytes Subtotal: 2 Non-hydrophytes Subtotal: 1

100 x Subtotal Hydrophytes

Subtotal Hydrophytes + Subtotal Non-hydrophytes = Percent Hydrophytes = 2/3=67%

HYDROLOGY

__ RECORDED DATA
- Stream, lake or tidal gate Identification:
- Aerial photograph Identification:
- Other Identification:

__x_ NO RECORDED DATA

___ OBSERVATIONS:
- Depth to Free Water:
- Depth to Saturation (including capillary fringe):
- Describe Altered Hydrology:

___ Inundated ___ Saturated in upper 12" ___ Water Marks ___ Drift Lines
___ Sediment Deposits __x_ Drainage Patterns in Wetland ___ Other:

SOIL

Sketch Landscape Position

Depth (inches)	Horizon	Matrix Color	Redoximorphic Features	USDA Texture; and nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.
0-20	A	5YR 4/3		Fine sandy loam; fill

HYDRIC SOIL INDICATOR(S): IV
REFERENCE: NEHSTC. 1998, 2nd Edition. Field Indicators for Identifying Hydric Soils in New England. New England Interstate Water Pollution Control Commission. Wilmington, MA. pp 76.

Optional Soil Data
Taxonomic Subgroup:
Soil Drainage Class:
Depth to Active Water Table:
NTCHS Hydric Soil Criterion:

References:

CONCLUSIONS

Greater than 50% Hydrophytes? yes
Hydric Soils Criterion Met? yes
Wetland Hydrology Met? yes

Is this datapoint a wetland? yes

Remarks/Plot Location: Plot is located 24 feet on a 130 degree bearing from flag 4-11.

PROJECT TITLE: *Middletown High School* TRANSECT: 10 PLOT: W

APPENDIX 4. MONITORING & ASSESSMENT GUIDELINES FROM NEW ENGLAND DISTRICT MITIGATION GUIDANCE DOCUMENT (12/15/03 DRAFT)

US Army Corps
of Engineers®
New England District

MITIGATION PLAN CHECKLIST

(see document entitled "Guidance for Mitigation Plan Checklist" for information on these items)

Project: _____
File No: _____
Corps Project Manager: _____
City: _____
State: _____
Plan Title, Preparer, Date: _____

TABLE OF CONTENTS

A. General Information

1. [ ] Mitigation plan and documentation submitted as one complete package.
2. Site location:
   a. [ ] Locus map(s)
   b. [ ] Aerial photo(s)
   c. [ ] Latitude/Longitude of mitigation site(s) in decimal format.
   d. [ ] 8-digit Hydrologic Unit Code(s) for impact area(s) and mitigation area(s).

B. Impact area(s)

1. [ ] Wetland acreage at each impact site.
2. [ ] Wetland classes at each impact site.
3. [ ] Stream(s) at each impact site.

4. [ ] Describe both site specific and landscape level wetland and stream functions and values at each impact site.
5. [ ] Describe type and purpose of work at each impact site.
6. [ ] Watershed or regional plans for the area.

C. Mitigation area(s)

1. Background information
   a. [ ] Mitigation alternatives.
   b. [ ] Existing wildlife use.
   c. [ ] Existing soil.
   d. [ ] Existing vegetation.
   e. [ ] Surrounding land use.
   f. [ ] USFWS and/or NOAA Clearance Letter or Biological Opinion
   g. [ ] SHPO Cultural Resource Clearance Letter
2. Mitigation proposed
   a. [ ] Wetland acreage proposed at each site.
   b. [ ] Wetland classes (e.g., Cowardin, et. al. and hydrogeomorphic classification) proposed at each site.
   c. [ ] Site specific and landscape level functions and values proposed at each site.
   d. [ ] Describe nature of any stream mitigation.
   e. [ ] Reference site(s).
   f. [ ] Design Constraints
   g. [ ] Construction oversight.
   h. [ ] Project construction timing.
   i. [ ] Responsible parties.
   j. [ ] Appropriate financial assurances.
   k. [ ] Potential to attract waterfowl and other bird species that might pose a threat to aircraft?

D. Hydrology

1. [ ] Evidence of adequate hydrology to support the desired wetland or stream.
   a. [ ] "Typical" year water budget
   b. [ ] "Wet" year water budget
   c. [ ] "Dry" year water budget
2. [ ] Water source(s)
3. [ ] Vernal pool (if any) hydrology is appropriate.

E. Grading Plan

1. Plan View
   a. [ ] Existing and proposed grading plans.
   b. [ ] Microtopography
   c. [ ] The scale should be in the range of 1"=20' to 1"=100'.
   d. [ ] All items on the plan must be legible on 8 ½ x 11" sheets.
   e. [ ] Plans have a bar scale.
2. [ ] Representative cross-sections
3. [ ] Other - Specific staff recommendations related to grading.

F. Topsoil

1. [ ] Proposed source of topsoil.
2. [ ] Twelve or more inches of natural or manmade topsoil in all wetland mitigation areas.
3. [ ] Appropriate organic content of topsoil.

G. Planting Plan

1. [ ] Plans use scientific names.
2. [ ] Plant materials are native and indigenous to the area of the site(s).
3. [ ] Vegetation community types or zones are classified in accordance with Cowardin, et al. (1979) or other similar classification system.
4. [ ] Plan view drawings show proposed locations of planted stock.
5. [ ] More than 50% of the plantings in each zone are structural determinants for the community type designated for that zone.
6. [ ] Woody stock density is appropriate.
7. [ ] Herbaceous stock density is appropriate.
8. [ ] Seed mix composition is provided.
9. [ ] Representative cross section plans showing vegetative community zones.
10. [ ] Invasive species not proposed for planting or seeding.
11. [ ] Relocation of plantings allowed when appropriate.
12. [ ] Other - Specific staff recommendations related to planting.

H. Coarse Woody Debris and Other Features

[ ] Appropriate amounts and range of decomposition of coarse woody debris are proposed.

I. Erosion Controls

[ ] Erosion control removal deadline is included.

J. Invasive and Noxious Species

1. [ ] Risk
2. [ ] Constraints
3. [ ] Control Plan

K. Off-Road Vehicle Use

1. [ ] No off-road vehicle use in immediate vicinity, or if so, control measures addressed.
2. [ ] Control plan, if appropriate.

L. Preservation

1. [ ] Adequate buffers
2. [ ] Wetlands within subdivisions are protected along with appropriate buffers.
3. [ ] Required preservation language is included.
4. [ ] Plans of preservation area(s).
5. [ ] Form of legal means of preservation
6. [ ] Documentation of acceptance by receiving agency (if applicable)

M. Monitoring Plan

[ ] Appropriate monitoring is proposed.

N. Assessment Plan

[ ] An appropriate assessment plan is included.

O. Contingency

[ ] Plan for dealing with unanticipated site conditions or changes.

P. Other Comments