

# Revised Vernal Pool Buffer, Stormwater Buffers and Wetland Restoration Plan

**York Police Station  
York, Maine**

**October 2012 (Revised May 2013)**



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## 1.0 PROJECT DESCRIPTION

The Town of York is constructing a new access road that will be located between U.S. Route 1 and Ridge Road in York, ME, as well as a new public safety building for the York Police Department (Figures 1 and 2). The public safety building will be located along the eastern side of the proposed access road and will include an access drive and parking area. In June 2012, the proposed project received both a Maine Site Location of Development Act/Natural Resource Protection Act Tier II Wetland Alteration (Site Location) permit (L-25623-26-A-N/L-25623-TE-B-N) and a U.S. Army Corps of Engineers (Corps) Programmatic General Permit (NAE-201-01928). The project also received approval under the Maine Permit-By-Rule program for impacts that would be associated with two stream crossing and impacts to a Significant Vernal Pool (SVP) buffer, which are the result of new road construction. Under these permits, the project received approval to alter 16,630 square feet (SF) of forested wetlands, 4,920 SF of stream bed, and 12 percent of the critical terrestrial habitat associated with the SVP. A wetland compensation plan was developed to mitigate for these resource impacts, as well as for impacts to the critical terrestrial habitat of three additional non-significant vernal pools that were under Corps jurisdiction. Preservation of a property located on Bell Marsh Road in York, which includes wetlands and vernal pools, was proposed and accepted by the regulatory agencies as mitigation for impacts to resources.

## 2.0 UPLAND BUFFER AND WETLAND IMPACTS

Following approvals from the regulatory agencies, the contractor for the Town of York began clearing and preparing the site for construction of the public safety building. Activities at the building site included vegetation clearing, blasting to remove ledge/rock, removal of topsoil, and site grading. The contractor also began initial preparation of the road corridor, which was limited to clearing and grubbing. During the course of these initial site preparation activities, planned upland buffers along the road corridor and a portion of a wetland located northeast of the road corridor were altered. In mid-August 2012, the Maine Department of Environmental Protection (MDEP) received notification regarding potential unpermitted impacts. Subsequently, on August 16, 2012, the project's Third-Party Inspector provided notification to the Corps regarding these impacts. On August 17, 2012, the Town of York (Town) Code Enforcement Office issued a Corrective Order related to these unpermitted impacts, which are described below.

### 2.1 VERNAL POOL BUFFER IMPACTS

The vernal pool buffer is associated with vernal pool VP07KW and located northwest of the public safety building site (Figure 3). This forested buffer was intended to remain intact and to function as critical terrestrial habitat for vernal pool VP07KW, a non-significant vernal pool under Corps jurisdiction. On August 21, 2012, Stantec Consulting (Stantec) conducted a site visit and used a Global Position System (GPS) Trimble® unit to establish the area of the buffer that had been altered. This area is approximately **119,871 SF (2.75 acres)** in size, and has been cleared of vegetation, grubbed, and has had the topsoil removed (Figure 3). Following these activities, topsoil and blasted rock were stockpiled within this area (Photos 1-2).

### 2.2 STORMWATER BUFFERS B-11 AND B-12 IMPACTS

Stormwater buffers B-11 and B-12 are located to the northwest of the public safety building site and adjacent to the new access road (Figure 3). Both buffers are also within the vernal pool habitat buffer described in Section 2.1. In accordance with the Site Location permit, these two stormwater buffers and 10 others were intended to remain forested to treat runoff from the new access road. All of stormwater buffer B-12 (approximately **5,664 SF**) was impacted, as was approximately **133 SF** of stormwater buffer B-11. The area of impact associated with these two stormwater buffers is included within the approximately 2.75 acres of impacts identified in Section 2.1.

### 2.3 Stormwater Buffer B-4 Impacts

Stormwater buffer B-4 is located near the western end of the new access road (Figure 5). This buffer was intended to remain forested to treat runoff from the access road. During a site visit conducted on August 27, 2012, SMRT and Stantec determined that all of Buffer B-4 (approximately **1,500 SF**) was cleared of vegetation (Photo 3).

### 2.4 WETLAND 3 IMPACTS

Wetland 3, which includes vernal pool VP07KW, is located to the northwest of the public safety building site and south of Wild Kingdom Road (Figure 3). Approximately **1,979 SF** of Wetland 3 was cleared of vegetation (Photos 4-5). Clearing occurred along the southwestern edge of the wetland, and a bark-mulch erosion control berm was placed inside of the wetland edge. The vernal pool depression was not directly altered by the clearing activities.

## 3.0 PRE-DISTURBANCE CONDITIONS

Following are descriptions of pre-disturbance conditions in altered portions of the buffers and Wetland 3.

### 3.1 WETLAND 3

Wetland 3 is a small, mixed scrub-shrub and emergent wetland that is located southwest of the covered bridge on Wild Kingdom Road (Photo 9). It is hydrologically connected to a larger wetland system located to the northeast via a culvert under the road. The shrub layer, where present, is comprised of highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), speckled alder (*Alnus incana*), and red maple (*Acer rubrum*). The herbaceous layer is dominated by cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), soft rush (*Juncus effusus*), sedges (*Carex* sp.), royal fern (*Osmunda regalis*), common cat-tail (*Typha latifolia*), fowl manna grass (*Glyceria striata*), white meadowsweet (*Spiraea alba*), common arrowhead (*Sagittaria latifolia*), swamp dewberry (*Rubus hispidus*), and wool-grass (*Scirpus cyperinus*). Soils within this wetland are fine sandy loam with a gleyed matrix. At the time of the 2007 delineation, soils exhibited redoximorphic features within seven inches of the mineral soil surface. Hydrologic indicators included saturation to soil surface and water-stained leaves.

The wetland includes a documented vernal pool (Photos 10-12). Stantec surveyed this pool on April 25, 2008. At the time of the vernal pool survey, the pool had more than 12 inches of surface water. Three wood frog (*Lithobates sylvaticus*) egg masses and 15 spotted salamander (*Ambystoma maculatum*) egg masses were observed. Adult green frog (*Lithobates clamitans*) and spring peepers (*Pseudacris crucifer*) also were observed within the pool.

### 3.2 VERNAL POOL BUFFER & STORMWATER BUFFERS B-11 & B-12

Based upon pre-disturbance observations and data collected to support the permit application process, the upland buffer associated with vernal pool VP07KW was an early to mid-successional forest (Photos 6-8). Trees in this buffer were generally sapling-sized with an average diameter-at-breast-height (DBH) of one to three inches. This area was historically cleared, as evidenced by stumps and skidder/equipment trails. Dominant trees included eastern white pine (*Pinus strobus*), red maple (*Acer rubrum*), sweet birch (*Betula lenta*), and gray birch (*Betula populifolia*), along with scattered northern red oak (*Quercus rubra*), eastern hemlock (*Tsuga canadensis*), red spruce (*Picea rubens*), and American beech (*Fagus grandifolia*). Dominant shrubs included sheep laurel (*Kalmia angustifolia*), highbush blueberry, chokecherry (*Prunus virginiana*), and alder-buckthorn (*Frangula alnus*). Wintergreen (*Gaultheria procumbens*), lowbush blueberry (*Vaccinium angustifolium*), Canada mayflower (*Maianthemum canadense*), and wild sarsaparilla (*Aralia nudicaulis*) occurred commonly in the herbaceous layer.

### 3.3 STORMWATER BUFFER B-4

Based upon the surrounding habitat, stormwater buffer B-4 was a second-growth forested community prior to disturbance. Red maple, gray birch, sweet birch, and eastern white pine dominated the canopy with a smaller component of eastern hemlock and northern red oak. Seedlings of these canopy species formed much of the understory. Species including bracken fern (*Pteridium aquilinum*), Canada mayflower, and partridge-berry (*Mitchella repens*) were present in the herbaceous layer.

## 4.0 RESTORATION REQUIREMENTS

Specific buffer and wetland restoration requirements were set forth by MDEP at an August 27, 2012, on-site meeting, and by the Corps at a September 18, 2012, on-site meeting and in a subsequent e-mail. The Town of York Community Development Department, which handles code enforcement, also required restoration of portions of the Shoreland Overlay District Mixed-Use Subdistrict (refer to Figure 3) that were impacted. Restoration will be required to meet the requirements of MDEP Site Location and Stormwater permits, the Corps General Permit, and the standards of the Town of York Zoning Ordinance. Those requirements are summarized below:

1. Top priority is to restore the area of unauthorized wetland alteration (i.e., a portion of Wetland 3). This shall be accomplished in the fall of 2012.
2. The bark mulch erosion control berm previously placed within the wetland shall be fully removed and relocated to the upland, immediately outside the area of wetland restoration.
3. Coarse woody debris, presently stockpiled on site, and stones will be used as appropriate within the restoration area to provide habitat diversity and structure.
4. A 100-foot buffer around the vernal pool boundary is the target for long-term restoration. This will conform to the minimum standards found in the Corps' Maine General Permit and shall be accomplished no later than the end of the 2013 growing season.
5. A 100-foot buffer around the wetland to the northwest of the altered area (Wetland 2) will be restored in order to meet the minimum requirements of the Town's Shoreland Zoning Ordinance.
6. The impacted stormwater buffers located along the proposed road will be relocated or restored to a vegetated state as required in the Site Location permit in order to adequately treat stormwater runoff generated from the project.
7. The revised buffer restoration plan (i.e., this document) shall contain a timetable for both immediate restoration of the wetland and longer-term restoration of the surrounding uplands.

## 5.0 WETLAND AND UPLAND BUFFER RESTORATION

The following plan addresses the restoration of Wetland 3 and the vernal pool and stormwater buffers to meet the requirements outlined above in Section 4. Restoration areas are shown on Figures 4 and 5.

### 5.1 RESTORATION GOALS

The principal goals for the restoration are to:

1. Re-establish scrub-shrub vegetation in affected portions of Wetland 3.
2. Re-establish forested conditions in a 100-foot wide vernal pool buffer, a 100-foot wide adjacent wetland/Shoreland Zone buffer, and in designated stormwater buffers B-4 and B-11 that were recently cleared.

3. Relocate and redesign stormwater buffer B-12.
4. Protect these buffers and Wetland 3 from future disturbance.

## 5.2 RESTORATION SCOPE

The restoration plan includes the following steps:

1. Within cleared portions of Wetland 3, remove the erosion control berm, add coarse woody debris, seed, and plant shrubs to re-establish vegetation.
2. Remove fill and stockpiled rock and soil within 100 feet of the vernal pool, within 100 feet of Wetland 2, and in stormwater buffer B-11, down to the approximate original ground. These buffers are hereafter referred to as the "Primary Buffer Restoration Area" and are shown on Figure 4.
3. Relocate stormwater buffer B-12 into the restored vernal pool buffer, and redesign as a Buffer with Stone Berm Level Lip Spreader, as approximately indicated on Figure 4.
4. Redistribute topsoil across the Primary Buffer Restoration Area to approximately pre-existing grades.
5. Distribute coarse woody debris from topsoil stockpiles across the Primary Buffer Restoration Area.
6. Seed the Primary Buffer Restoration Area and stormwater buffer B-4 to stabilize the soils and provide native plant cover.
7. Plant the Primary Buffer Restoration Area and stormwater buffer B-4 with native woody stock that will re-establish forest and understory cover.
8. Install signs around the Primary Buffer Restoration Area and Wetland 3 to protect these areas from future disturbance.<sup>1</sup>
9. Monitor Wetland 3 and all restored buffer areas to determine the success of restoration efforts.

## 5.3 RESTORATION ACTIVITIES

### 5.3.1 Construction Oversight

A wetland scientist experienced with wetland and upland restoration will be on-site to monitor the site restoration activities and to help achieve the specifications of this plan. The wetland scientist primarily will be responsible for providing the site contractor with recommendations and guidance on re-soiling, final grading (i.e., matching pre-existing grades), planting, seeding, and coarse woody debris placement.

### 5.3.2 Restoration of Wetland 3

#### Schedule

Restoration work at Wetland 3, as described below, will be initiated in the fall of 2012. Signage may be completed in 2013 in association with the buffer restoration work.

#### Removing Erosion Control Berm:

The erosion and sedimentation control bark mulch berm previously installed in the cleared portion of Wetland 3 and the vernal pool buffer will be removed from the wetland and placed in uplands approximately 5-10 feet from the wetland edge.

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<sup>1</sup> The stormwater buffers will be marked in accordance with the requirements of Maine Site Location of Development Act/Natural Resource Protection Act Tier II Wetland Alteration permit (L-25623-26-A-N/L-25623-TE-B-N).

Distributing Coarse Debris:

The topsoil stockpiles located on-site contain coarse woody debris in the form of stumps, logs (greater than 12 inches in diameter), and root masses. Some of this coarse woody debris, along with a few large rocks and boulders, will be spread randomly across cleared portions of Wetland 3 prior to planting, to cover approximately one to three percent of the total cleared wetland area. This will provide structural diversity and microhabitat for wildlife, in particular for amphibians and small mammals.

Planting Woody Stock

The wetland restoration area, totaling 1,979 SF, will be planted with a mix of native shrubs similar to what is present in the undisturbed portion of the wetland. Shrubs will be planted at a density of approximately 600 plants per acre. Table 1 provides a summary of suggested species and number of plants needed. The actual number of each species to be installed may vary depending on availability at the time of planting. Installation will follow the methods described in Section 5.3.3 below.

**Table 1: Recommended Shrub Plantings for Wetland 3 Restoration Area.**

Type	Species	Common Name	NWI Status	~ Number of Plants Needed
Shrubs	<i>Alnus incana ssp. rugosa</i>	Speckled alder	FACW	8
	<i>Ilex verticillata</i>	Common winterberry	FACW	8
	<i>Vaccinium corymbosum</i>	Highbush blueberry	FACW	8
	<i>Salix bebbiana</i>	Long-beaked willow	FACW	6
<b>Total Plants:</b>				<b>30</b>

Seeding and Mulching:

The wetland restoration area will be seeded with a native seed mix. It is anticipated that the New England Wetmix® available from New England Wetland Plants, Inc. (Table 2), or similar mix, will be used. The seed mix will be applied per the manufactures recommendations. Seeding and mulching methods will follow those described in Section 5.3.3 below.

**Table 2: Typical Wetland Seed Mix for Wetland Restoration Areas  
New England Wetmix®, Example Species Diversity\***

Species	Common Name
<i>Alisma plantago-aquatica</i>	Mud plantain
<i>Asclepias incarnata</i>	Swamp milkweed
<i>Symphyotrichum novi-belgii</i> (syn. <i>Aster novi-belgii</i> )	New York aster
<i>Bidens cernua</i>	Nodding bur marigold
<i>Carex comosa</i>	Bristly/Cosmos sedge
<i>Carex crinita</i>	Fringed sedge (Nodding)
<i>Carex lupulina</i>	Hop sedge
<i>Carex lurida</i>	Lurid sedge (Shallow)
<i>Carex scoparia</i>	Blunt broom sedge
<i>Carex vulpinoidea</i>	Fox sedge
<i>Eupatorium maculatum</i>	Spotted joe pye weed
<i>Eupatorium perfoliatum</i>	Boneset
<i>Glyceria canadensis</i>	Rattlesnake grass
<i>Glyceria striata</i>	Fowl manna grass
<i>Juncus effusus</i>	Soft rush
<i>Mimulus ringens</i>	Square stemmed monkey flower
<i>Onoclea sensibilis</i>	Sensitive fern
<i>Scirpus atrovirens</i>	Green bulrush
<i>Scirpus cyperinus</i>	Wool grass
<i>Schoenoplectus tabernaemontani</i> (syn. <i>Scirpus validus</i> )	Soft stem bulrush

\*Recommended application: 18 pounds per acre

Installing Signage:

The installation of signs around the vernal pool habitat buffer will include Wetland 3. See Section 5.3.3 below for details.

### 5.3.3 Primary Buffer Restoration Area

Schedule

Restoration work in the Primary Buffer Restoration Area, as described below, will be initiated when construction activities resume for the York Police Station. It is expected that the restoration work will be completed by the end of the 2013 growing season, pending approval of the project by the Town planning board.

Removing Blast Rock:

The recent fill and stockpiles of blast rock and stone will be removed from the Primary Buffer Restoration Area at the time of the restoration. This material will either be used on site for project construction or will be moved to the cleared and filled area between the proposed police station and the Primary Buffer Restoration Area, depending on the timing of restoration and project construction. Re-located stockpiles will be protected from erosion using Best Management Practices (e.g., erosion control berms, blankets, temporary seeding).

Redistributing Topsoil:

Following removal of rock piles and fill, stockpiled topsoil will be redistributed across the Primary Buffer Restoration Area to approximately match pre-existing grades. The interface between the fill and original ground should be apparent upon fill removal. Approximately 12 to 24 inches of topsoil will be spread evenly over the restoration area to re-create the pre-disturbance grading and contours. To minimize potential erosion and sedimentation, earthwork will not occur during or immediately following heavy rain events.

Distributing Coarse Debris:

The topsoil stockpiles include coarse woody debris in the form of stumps, logs (greater than 12 inches in diameter), and root masses. This coarse woody debris, along with a few large rocks and boulders, will be spread randomly across the Primary Buffer Restoration Area to cover approximately one to three percent of the total area. This will provide structural diversity and microhabitat for wildlife, in particular for amphibians and small mammals.

Planting Woody Stock:

The Primary Buffer Restoration Area, totaling approximately 37,490 SF (+/- 0.86 acre), will be planted with a mix of native trees and shrubs similar to what was present prior to disturbance. Trees and shrubs will be planted at a density of approximately 425 plants per acre, at a ratio of 70 percent trees and 30 percent shrubs. Table 3 provides a breakdown of tree and shrub plantings and the suggested species and number of plants needed to achieve this density.

**Table 3: Recommended Tree and Shrub Plantings for the Primary Buffer Restoration Area**

Type	Species	Common Name	~ Number of Plants Needed
Trees	<i>Acer rubrum</i>	Red maple	40
	<i>Betula lenta</i>	Sweet birch	20
	<i>Betula populifolia</i>	Gray birch	40
	<i>Quercus rubra</i>	Northern red oak	40
	<i>Picea rubens</i>	Red spruce	40
	<i>Pinus strobus</i>	Eastern white pine	40
	<i>Tsuga canadensis</i>	Eastern hemlock	40
	<i>Total Trees:</i>		<b>260</b>
Shrubs	<i>Corylus cornuta</i>	Beaked hazelnut	40
	<i>Hamamelis virginiana</i>	Witch-hazel	40
	<i>Kalmia angustifolia</i>	Sheep laurel	30
	<i>Total Shrubs:</i>		<b>110</b>
<b>Total Plants:</b>			<b>370</b>

Trees and shrubs will be installed singly or in small groups evenly distributed at approximately 10-foot spacing. At the time of planting, the majority of the trees will range in height from approximately 3 to 4 feet with approximately 10 percent ranging from 5 to 6 feet in height. Shrubs will range from 12 to 36 inches at the time of planting. Actual heights will vary by species and age of available plants. It is anticipated that planting stock will primarily consist of container-grown material.

Trees and shrubs will be planted by hand. Holes will be dug up to 50 percent wider than and as deep as the root mass of the plants. The planting holes will be backfilled with topsoil around the roots and lightly compacted around the plants to remove air pockets. Each plant will be watered immediately following installation unless the soil is sufficiently saturated at the time of planting. Tree guards may be installed on deciduous tree species to protect from browsing and girdling. Bark mulch at least three feet in diameter will be placed around the base of plants for moisture and weed control purposes. As needed, plants may be watered for the first several weeks after installation if natural soil moisture is insufficient or rain is not in the immediate forecast.

The planting schedule for the restoration sites will depend on approval of this plan and the completion of ground preparation activities. Planting will occur only when conditions are favorable for plant survival, which is typically either early fall (September 1 through mid-October) or in the spring (prior to June 20). Summer planting is acceptable, though watering on a weekly basis would likely be required to make up for the typical lack of summer rainfall. The actual planting schedule will be communicated to MDEP and the Corps once the completion of site preparation activities can be accurately predicted. Following the completion of planting, a summary of the number of plants by species installed in each buffer area will be provided to MDEP and the Corps.

#### Seeding and Mulching:

The Primary Buffer Restoration Area will be seeded with a native seed mix. It is anticipated that the New England Conservation/Wildlife Mix® available from New England Wetland Plants, Inc. (Table 4), or a similar mix, will be used. The seed mix will be applied per manufacturer recommendations. If applied by hydroseeding methods, supplemental watering or mulching may not be required at the time of seeding. If applied by hand (i.e., shoulder-mounted broadcaster), seeded areas will be covered with a thin layer of weed-free straw mulch to retain soil moisture and promote seed germination. Straw mulch will be applied over the seed at a rate of approximately 2 bales per 1,000 SF for a total of approximately 75 bales. Seeded areas may be watered for the first several weeks after seeding, as needed, if natural soil moisture in the restoration area is insufficient or rain is not in the immediate forecast.

If timing of activities allow, seeding will occur following planting at each of the buffer areas but only when conditions are favorable for germination and growth (typically spring, early summer, and early fall). For erosion control purposes, seeding may need to occur before planting. If seeding occurs after approximately October 1, seeding rates will be increased by as much as 50 percent. A cover crop of annual ryegrass (*Lolium multiflorum*) also will be applied during late-season seeding to provide more immediate cover to the areas.

**Table 4: Typical Seed Mix for Upland Buffer Areas  
New England Conservation/Wildlife Mix®, Example Species Diversity\***

<b>Species</b>	<b>Common Name</b>
<i>Andropogon gerardii</i>	<i>Big bluestem</i>
<i>Asclepias syriaca</i>	<i>Common milkweed</i>
<i>Aster novae-angliae</i>	<i>New England aster</i>
<i>Chamaecrista fasciculata</i> (Cassia f.)	<i>Partridge pea</i>
<i>Desmodium canadense</i>	<i>Showy tick trefoil</i>
<i>Elymus virginicus</i>	<i>Virginia wild rye</i>
<i>Eupatorium maculatum</i>	<i>Spotted joe pye weed</i>
<i>Euthamia graminifolia</i> (Solidago g.)	<i>Grass leaved goldenrod</i>
<i>Festuca rubra</i>	<i>Creeping red fescue</i>
<i>Heliopsis helianthoides</i>	<i>Ox eye sunflower</i>
<i>Panicum clandestinum</i>	<i>Deer tongue</i>
<i>Panicum virgatum</i>	<i>Switch grass</i>
<i>Rudbeckia laciniata</i>	<i>Tall/Green headed coneflower</i>
<i>Schizachyrium scoparium</i>	<i>Little bluestem</i>
<i>Solidago juncea</i>	<i>Early goldenrod</i>
<i>Sorghastrum nutans</i>	<i>Indian grass</i>

\*Recommended application: 25 pounds per acre

#### Installing Signage:

Following the completion of planting and seeding, signs will be installed at 100-foot intervals along the edge of the Primary Buffer Restoration Area. The signs will be mounted on sturdy metal or cedar posts. The signs will indicate that the habitat buffer and wetland are protected and that no vegetation removal or disturbance beyond the boundary of the signs is allowed. The stormwater buffers will be marked in accordance with the requirements of Maine Site Location of Development Act/Natural Resource Protection Act Tier II Wetland Alteration permit (L-25623-26-A-N/L-25623-TE-B-N).

#### *5.3.4 Relocation and Redesign of Stormwater Buffer B-12*

##### Schedule

Stormwater buffer B-12 will be relocated to inside the Primary Buffer Restoration Area, specifically within the 100 foot vernal pool buffer (Figure 4). As indicated in Section 5.3.3 above, it is expected that restoration of this area will be completed by the end of the 2013 growing season, pending approval of the project by the Town planning board. Installation of the redesigned stormwater buffer B-12 will follow this same schedule.

##### Redesign of Stormwater Buffer B-12

In order to conform to the standards of the MDEP Stormwater Manual, stormwater buffer B-12 will be revised to a Buffer with Stone Berm Level Lip Spreader. For additional information regarding the design of this buffer, refer to addendums to the Stormwater Management Report prepared by SMRT.

### 5.3.5 Restoration of Stormwater Buffer B-4

#### Schedule

Restoration work in Stormwater Buffer B-4, as described below, will be initiated in the spring of 2013 and will be completed before July 1, 2013.

#### Planting Woody Stock:

The planting density for stormwater Buffer B-4, which totals 1,500 SF, will be 600 plants per acre. Because of the small size of this area, only tree species will be planted. Table 5 provides a summary of suggested species and number of plants needed. The actual number of each species to be installed may vary depending upon availability at the time of planting. Methods for planting will follow those described in Section 5.3.3 above.

#### Seeding and Mulching:

Stormwater buffer B-4 will be seeded with a native seed mix. It is anticipated that the New England Conservation/Wildlife Mix® available from New England Wetland Plants, Inc. (see Table 4 above), or a similar mix, will be used. Seeding and mulching will follow methods described in Section 5.3.3.

**Table 5: Recommended Tree and Shrub Plantings for Stormwater Buffers B-4 and B-5**

Buffer	Species	Common Name	~ Number of Plants Needed
B-4	<i>Acer rubrum</i>	Red maple	6
	<i>Betula populifolia</i>	Gray birch	6
	<i>Pinus strobus</i>	Eastern white pine	6
		<b>Total Trees:</b>	<b>18</b>

## 6.0 MONITORING AND REPORTING

### 6.1 SUCCESS STANDARDS

Post-restoration monitoring is necessary to determine whether the restored upland buffers and wetland are achieving/approaching pre-disturbance conditions. Restoration efforts in the upland buffer areas and wetland will be determined to be successful if at the end of the monitoring period, the following conditions are met.

1. Woody Plant Density: In the Primary Buffer Restoration Area, there are at least 400 native, non-invasive trees and shrubs per acre that are healthy and vigorous and in 75 percent of the planted area. In the restored wetland and in Stormwater Buffer B-4, there are at least 500 native, non-invasive trees and shrubs per acre that are healthy and vigorous and in 75 percent of the planted area. Native, woody volunteer species will be counted toward this density standard.
2. Percent Areal Plant Cover: There is at least 75 percent areal cover by native, non-invasive herbaceous plant species. In the wetland restoration area, at least 60 percent of the areal cover shall consist of native, hydrophytic plant species.
3. Invasive Species: Control of alder-buckthorn, multiflora rose (*Rosa multiflora*), Morrow's honeysuckle (*Lonicera morowii*), Japanese barberry (*Berberis thunbergii*), and other identified non-native, invasive species has been accomplished during the monitoring period, in accordance with the Invasive Species Control Plan for this site (see attached). The goal of the invasive species control will be to not allow invasive species to suppress or hinder the growth of planted

trees and shrubs, and to prevent the occurrence of contiguous, monotypic stands of invasive plants that are greater than 500 square feet in size.

4. Erosion Control: Soils within the restoration areas are stabilized and soil erosion is minimized.

## 6.2 MONITORING SCHEDULE

Post-Construction monitoring of the upland buffers and the restored portion of Wetland 3 will begin in the first full growing season after the completion of site work and planting. It is anticipated that monitoring will occur on the following schedule:

- Wetland 3 – 2013, 2014, and 2015 (3 years)
- Primary Buffer Restoration Area and Stormwater Buffer B-4 – 2014 and 2015 (2 years)

## 6.3 MONITORING METHODS

A qualified wetland scientist will conduct and/or oversee the monitoring. Site visits will occur once a year for each of the monitoring years, and will be scheduled towards the end of the growing season (i.e., between July 15 and September 30). Monitoring will include assessments of woody stock survivorship, herbaceous plant cover, the presence of invasive species, and soil stability. During the site visits, each of the buffer areas and the restored portion of Wetland 3 will be evaluated to determine if corrective measures are necessary.

### Wetland 3

The conditions within the restored portion of Wetland 3 will be assessed using meander surveys. During the meander surveys, the wetland scientist will count and assess the health of all of the planted woody stock within the restored portion of the wetland. Native woody volunteer species within the wetland restoration area will also be counted. In addition to counting woody species, general signs of herbaceous plant cover, the presence of non-native invasive plants, and soil erosion will be documented. Representative photographs will be taken from similar locations each year.

### Primary Buffer Restoration Area - Vernal Pool Buffer & Stormwater Buffers B-11

Seven 10-meter by 10-meter (10-m<sup>2</sup>) plots will be sampled within the Primary Buffer Restoration Area to evaluate the success of restoration efforts. This sampling level will allow the assessment of approximately 20 percent of the restored area. The plots will be randomly located throughout the restored area at the discretion of the wetland scientist who performs the monitoring. Within each 10-m<sup>2</sup> plot, planted trees and shrubs will be counted by species, and the overall areal coverage of tree and shrub species within the plot will be estimated to the nearest 5 percent. Native, woody volunteer species within each monitoring plot will also be counted. A meander survey of each plot will be used to assess herbaceous plant cover, the presence of non-native invasive plants, and soil erosion. Representative photographs will be taken from similar locations each year.

### Stormwater Buffer B-4

Because of the small size of Buffer B-4, meander surveys will be conducted to count and assess the health of all of the planted woody stock in the area. Native woody volunteer species within the restored buffer will also be counted. In addition to counting woody species, the wetland scientist will record general signs of herbaceous plant cover, the presence of non-native invasive plants, and soil erosion. Representative photographs will be taken from similar locations each year.

## 6.4 REPORTING

An annual monitoring report will be prepared for each monitoring year and submitted to the Corps and MDEP by January 31 of the year following monitoring. The report will describe the methodology and results of the monitoring, and provide an assessment of the upland buffer and wetland restoration

success relative to the performance standards. The report will also include recommendations for remedial actions that may need to be implemented to improve the success of the restoration, and a description of corrective measures completed during that year. Potential remedial actions identified during monitoring will be addressed in a timely manner. The MDEP and Corps will be consulted on a case-by-case basis regarding the need for on-site corrections or adaptive management measures. Such measures may include replacing dead shrubs and trees, invasive species control, supplemental seeding, fertilizing woody plantings, and erosion control or repair. Rodent or deer browsing will be considered a natural process, and such damage will not be remediated unless it is widespread and significantly impacts restoration of vegetation cover.

**APPENDIX A**  
REPRESENTATIVE PHOTOGRAPHS



**Photo 1:** Habitat buffer associated with vernal pool 07KW following clearing and stockpile activities. Stantec Consulting. August 21, 2012.



**Photo 2:** Habitat buffer associated with vernal pool 07KW following clearing and stockpile activities. Stantec Consulting. August 21, 2012.



**Photo 3:** Access road and stormwater buffer B-4 following clearing activities. SMRT. August 21, 2012.



**Photo 4.** Wetland 3 following clearing activities. Note bark mulch berm in wetland. Stantec Consulting, August 21, 2012.



**Photo 5.** Wetland 3 and adjacent upland habitat buffer following clearing activities. Stantec Consulting, August 21, 2012.



**Photo 6:** Habitat buffer associated with vernal pool 07KW prior to clearing activities. Stantec Consulting. March 4, 2010.



**Photo 7:** Remaining habitat buffer associated with vernal pool 07KW adjacent to cleared buffer. Stantec Consulting. August 21, 2012.



**Photo 8:** Remaining habitat buffer associated with vernal pool 07KW adjacent to cleared buffer. Stantec Consulting. August 21, 2012.



**Photo 9:** Wetland 3 and vernal pool VP07KW in background.  
Stantec Consulting. March 4, 2010



**Photo 10:** Vernal Pool 07KW in Wetland 3.  
Stantec Consulting. July 2007.



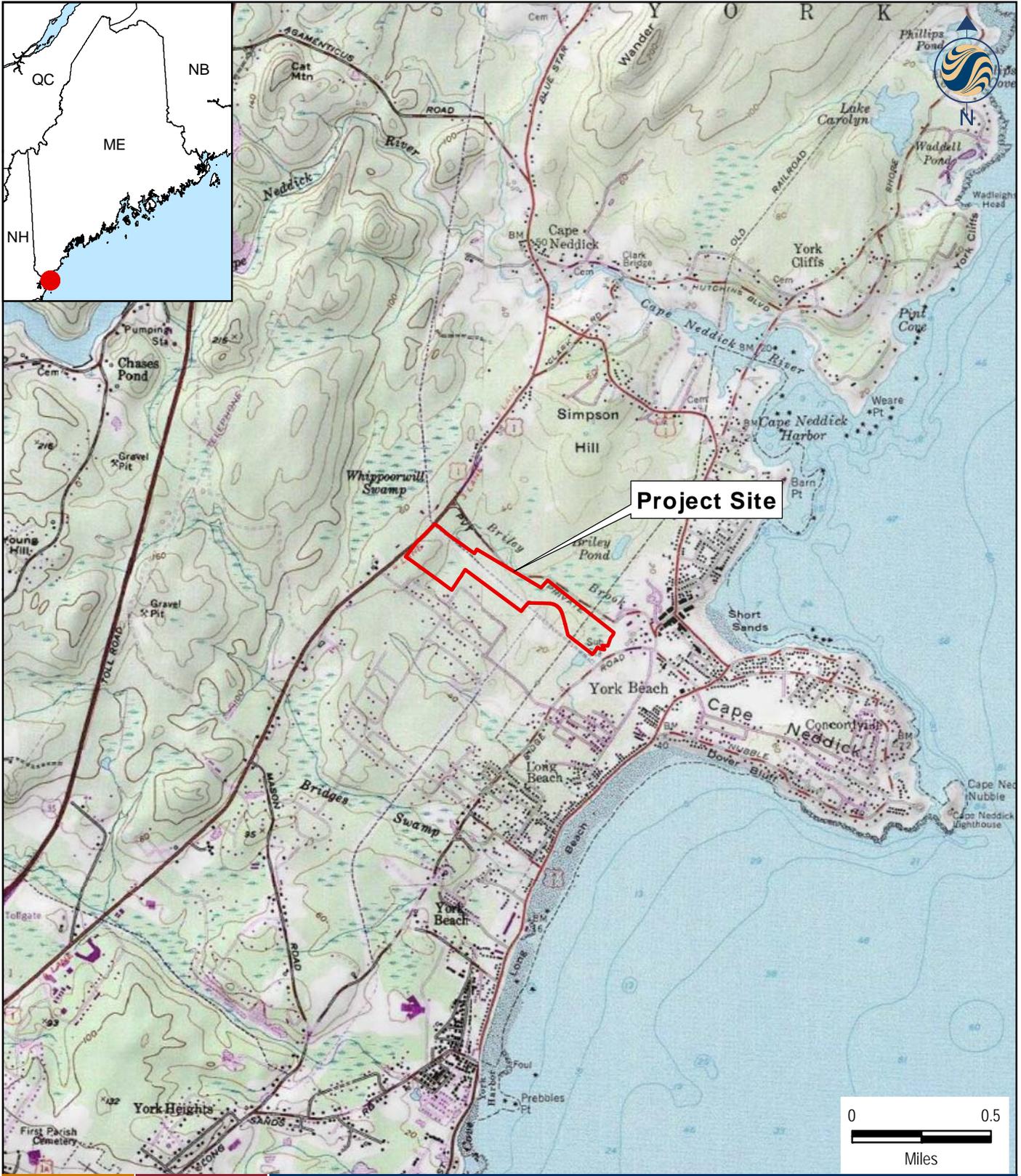
**Photo 11:** Vernal Pool 07KW in Wetland 3.  
Stantec Consulting, April 25, 2008.



**Photo 12:** Vernal Pool 07KW in Wetland 3.  
Stantec Consulting, April 25, 2008.

## **APPENDIX B**

### **FIGURES**



195600823



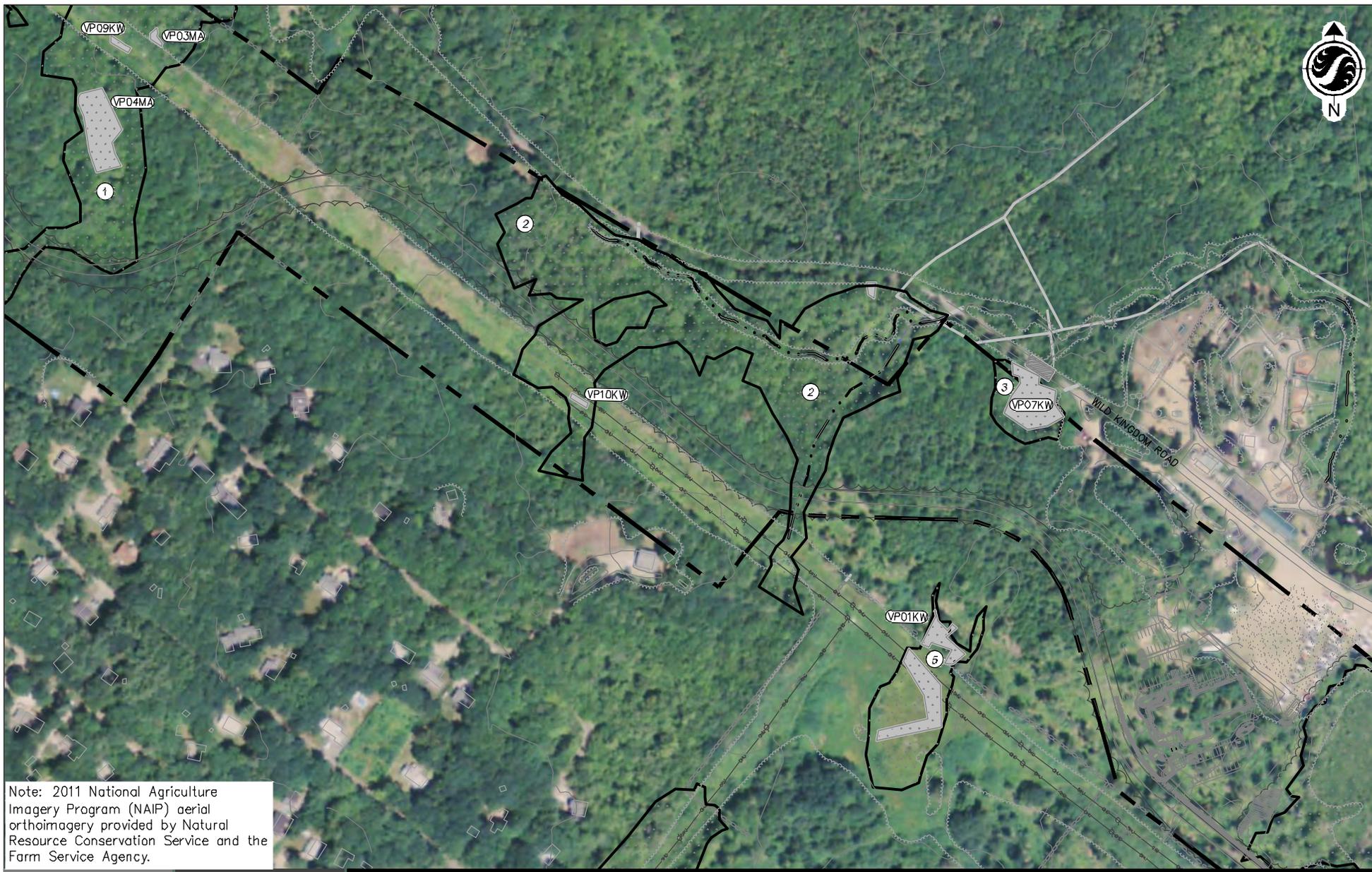
**Stantec**

**Stantec Consulting Services Inc.**  
 30 Park Drive  
 Topsham, ME USA  
 04086  
 Phone (207) 729-1199  
 Fax: (207) 729-2715  
 www.stantec.com

Client/Project  
 SMRT  
 York Police Station  
 York, Maine

Figure No.  
 1

Title  
**Project Site**  
 September 4, 2012

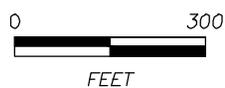


Note: 2011 National Agriculture Imagery Program (NAIP) aerial orthoimagery provided by Natural Resource Conservation Service and the Farm Service Agency.



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- Legend**
- Wetland Identified by Stantec
  - Vernal Pool Identified by Stantec
  - MDEP stream identified by Stantec
  - Proposed Developments (Road and Police Station)

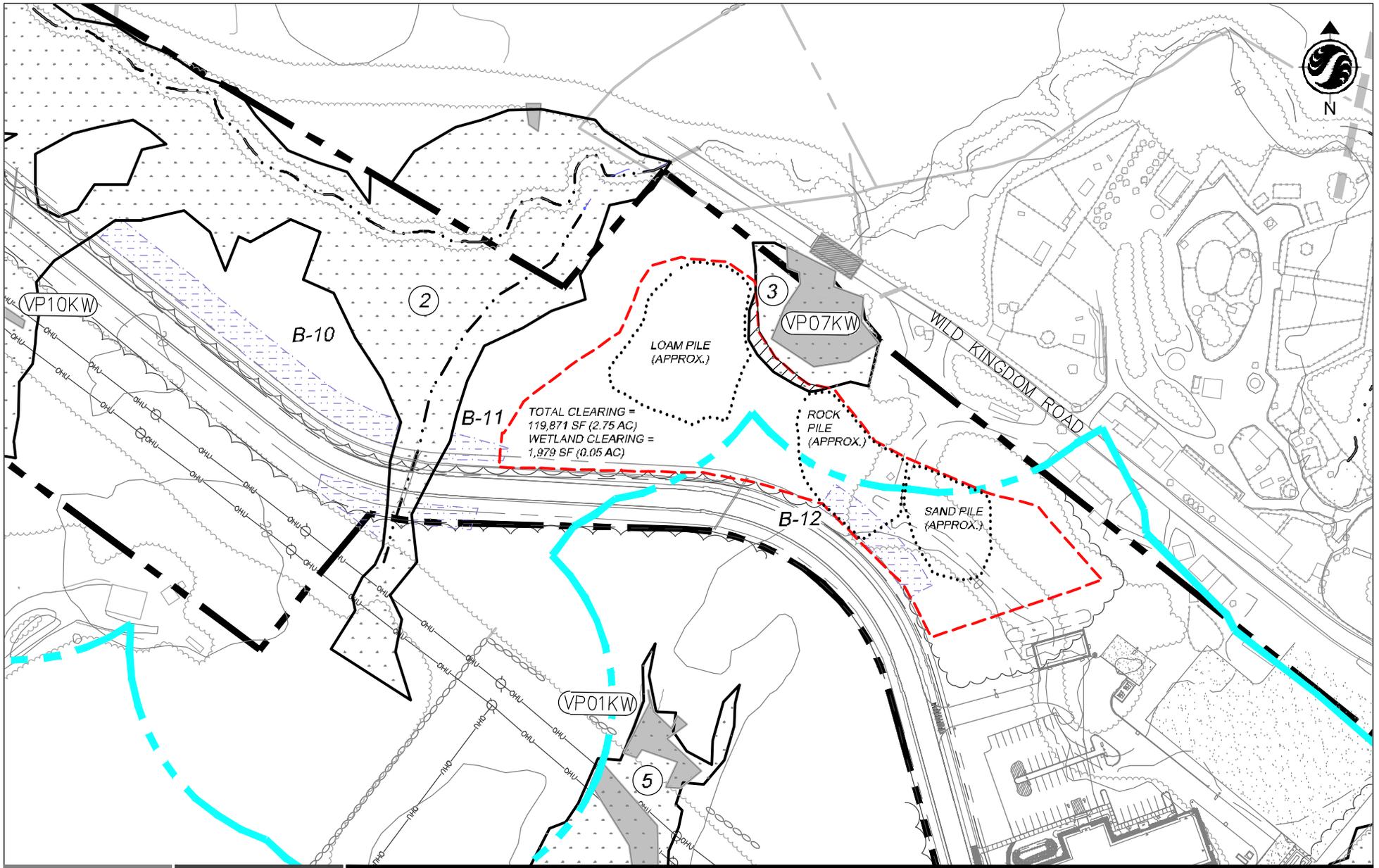


Client/Project 195600823

York Police Station, York ME  
 Buffer Restoration Plan  
 Figure No. 2

Title  
**Pre-Disturbance Conditions**

October 3, 2012



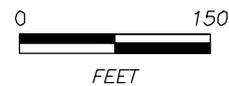
**Stantec**

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**Legend**

- Wetland Identified by Stantec
- Vernal Pool Identified by Stantec
- MDEP stream identified by Stantec
- Mixed-Use Shoreland Zone (Town of York)
- Stormwater Buffer Easement
- Altered Area (GPS by Stantec, Aug 2012)
- Wetland Clearing



Client/Project

195600823

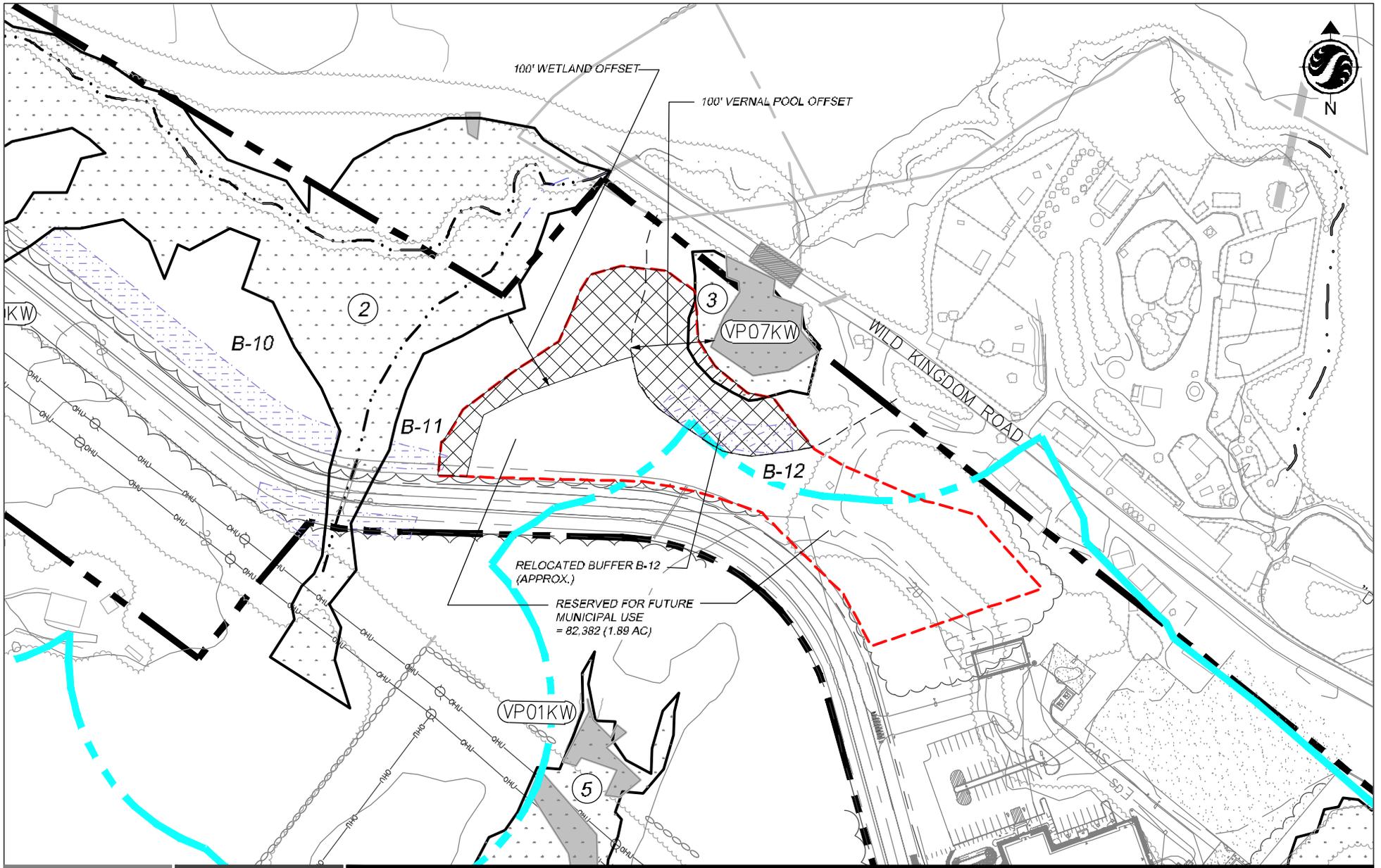
York Police Station, York ME  
 Buffer Restoration Plan

Figure No.  
**3**

Title

**Altered Vernal Pool Buffer and Stormwater  
 Buffers B-11 and B-12**

October 3, 2012



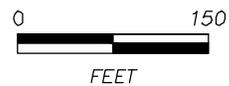
**Stantec**

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 Fax. 207.729.2715  
 www.stantec.com

Legend

- Wetland Identified by Stantec
- Vernal Pool Identified by Stantec
- MDEP stream identified by Stantec
- Mixed-Use Shoreland Zone (Town of York)
- Stormwater Buffer Easement
- Altered Area = 119,871 SF (2.75 AC)
- Proposed Wetland Restoration = 1,979 SF (0.05 AC)
- Proposed Primary Buffer Restoration = 37,490 SF (0.86 AC)



Client/Project

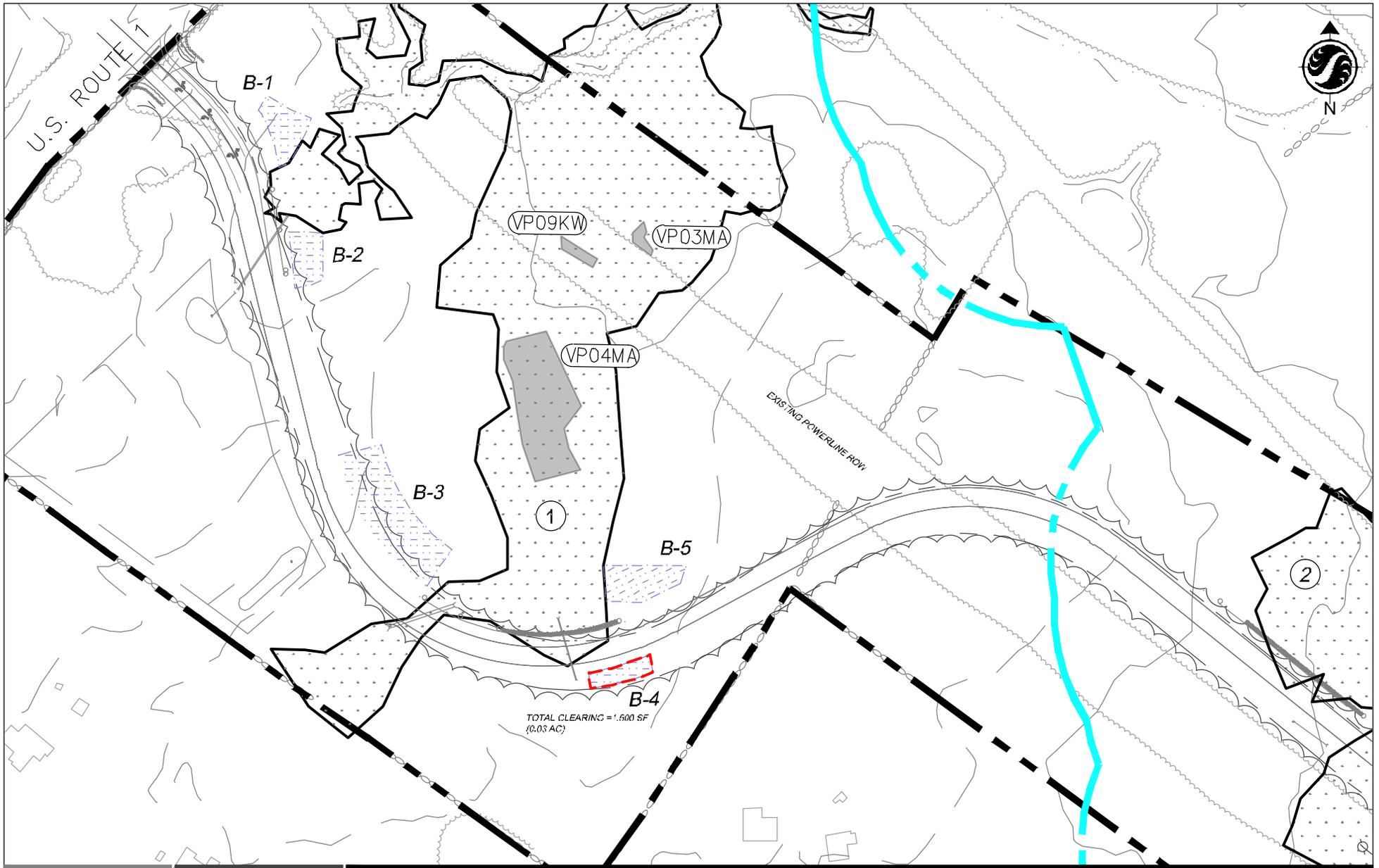
195600823

York Police Station, York ME  
 Buffer Restoration Plan

Figure No.  
 4

Title

**Primary Buffer Restoration Area**  
**Wetland 3 and Buffers B-11 & B-12 Area**  
 October 22, 2012



TOTAL CLEARING = 1,500 SF  
(0.03 AC)

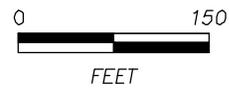


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**Legend**

- ② [Stippled Box] Wetland Identified by Stantec
- [VP01KW] [Grey Box] Vernal Pool Identified by Stantec
- [Dashed Line] MDEP stream identified by Stantec
- [Cyan Line] Mixed-Use Shoreland Zone (Town of York)
- [Blue Hatched Box] Stormwater Buffer Easement
- [Red Dashed Box] Altered Area (To Be Replanted)

\* Not all Legend items appear on map.



Client/Project 195600823

York Police Station, York ME  
 Buffer Restoration Plan  
 Figure No. 5

Title  
**Stormwater Buffer B-4 Restoration Area**  
**Altered Area to Be Re-Planted**  
 October 22, 2012

**APPENDIX C**  
**INVASIVE SPECIES CONTROL PLAN**

The approach to controlling invasive plants in the vernal pool and stormwater buffers and wetland restoration area will focus on limiting the establishment of invasive species that could encroach from nearby areas. There are existing invasive plants, in particular alder-buckthorn (*Frangula alnus*), present in the surrounding area. The overall approach, therefore, will be to limit the extent of invasive plants and attempt to keep them from dominating the sites, suppressing the growth of planted trees and shrubs, or forming large (i.e., over 500 square feet in area) contiguous, monotypic stands that significantly affect species diversity and habitat functions and values.

#### Target Species

Invasive species are currently found in nearby areas, including alder-buckthorn, purple loosestrife (*Lythrum salicaria*), oriental bittersweet (*Celastrus orbiculata*), Japanese barberry (*Berberis thunbergii*), common reed (*Phragmites australis*), Morrow's honeysuckle (*Lonicera morrowii*), and multiflora rose (*Rosa multiflora*). Each of these species poses a moderate to high risk of colonization into the restored areas.

#### Passive Controls

Passive invasive species control focuses on preventing and limiting the initial introduction of invasive species into the restored areas. The following measures will be implemented to prevent or limit the introduction of invasive species into the restored areas.

- Exposed soil surfaces will be seeded with the prescribed mixes and mulched with weed free straw as soon as possible following final grading. If hydroseeded, fiber mulch will be applied by the hydroseeder, which may require supplemental straw mulch to thoroughly cover the exposed soil. Straw mulch will be applied at a rate of up to 2 bales per 1,000 square feet or as needed to cover the soil.
- If seeding cannot occur immediately following final grading due to seasonal constraints, the exposed soil will be temporarily mulched with straw until seeding occurs.
- Bark mulch with a three-foot diameter will be installed at the base of each installed plant and maintained to reduce competition by invasive species and other weeds.
- The planting plan has been designed to restore upland forested habitat over time. Shade-intolerant species will not be able to persist under the shaded conditions of the forested uplands, and this will be one of the primary means of controlling these species over the long term. However, it is expected that it will take several years (i.e., 10 years or more) for the re-planted areas to develop sufficient canopy and shading to limit these species. In that interim, active methods (as described below) may be implemented to control invasive species and limit competition with the planted trees and shrubs.

#### Active Controls

Active invasive species controls may need to be implemented within the restoration sites to control invasive plant species that are able to become established following construction. Active invasive control, if needed, will generally begin after restoration and continue through the monitoring period. Active measures may include the following.

- Prior to or shortly after plant installation, invasive plants identified within the upland buffer and wetland restoration areas will be controlled. Small, individual plants will be manually pulled or dug from the ground. Limited herbicide treatments using Rodeo® (active ingredient: glyphosate), a non-selective, systemic herbicide, may be employed on larger individual plants, particularly mature plants capable of producing fruit. As needed, these control methods also will be employed on an annual basis during the monitoring period.
- Within the restoration areas, annual monitoring will be conducted to assess the presence and abundance of invasive species. The course of action will depend primarily on the species present and the abundance. In general, removal by hand and proper disposal will be utilized for small, localized patches or individual plants.