

DRAFT

**ENVIRONMENTAL INVENTORY, EVALUATION
AND IMPACT ASSESSMENT**

**NEWTOWN TECHNOLOGY PARK
NEWTOWN, CT**

PREPARED FOR:

TOWN OF NEWTOWN

March 2, 2007

INTRODUCTION

This report documents the results of investigations conducted by Environmental Planning Services (EPS) at the site of a proposed industrial park in Newtown, CT. EPS was retained to inventory the natural resources, including wildlife habitats, plant communities and wetland functions and values for an approximately 76acre site located on the south side of Commerce Road in Newtown, CT. The Town of Newtown is proposing to develop an industrial park at the site, and this report was prepared in support of applications for necessary land use approvals.

METHODS AND LIMITATIONS

The limits of CT-jurisdiction wetlands at the site had been previously flagged and located by others. EPS wetland scientists confirmed the wetland boundaries and identified minor necessary adjustments to the survey. They also identified the limits of wetlands and watercourses subject to federal (US Army Corps of Engineers) jurisdiction under the Clean Water Act. A botanical survey was conducted by Environmental Planning Services (EPS) biologist James Cowen on June 8, July 7 and 13, 2006. Most species were identifiable except for late season grasses and wildflowers.

A field visit was made to the site on October 25, 2006 by EPS wildlife biologist Eric Davison. The purpose of the field visit was to characterize the habitats which are present on the site in order to develop an inventory of wildlife species which inhabit the site. The inventory of species included in this report (Table 2) was developed based on the presence of suitable habitat and the known distribution of wildlife in CT. Breeding-season wildlife surveys were not conducted at this site.

In addition, the site's wildlife value in relation to the surrounding area was also analyzed using GIS (Geographic Information System) data obtained from the CT Department of Environmental Protection. Because wildlife species do not recognize man-made boundaries, a landscape scale analysis is important to better understand the site's overall value.

All of the data collection was used to develop a functions and values assessment for the wetlands at the site. The US ACOE/FHWA Highway method was used, along with best professional judgment to identify the relative magnitude of the functions and values present.

SOILS

As noted above, a detailed wetland delineation by a soil scientist had previously been completed. The flagging was substantially correct, but EPS staff identified minor additional intermittent watercourses/drainageways not previously flagged. In one area,

the limits of CT and federal jurisdiction were not coincident and this area was flagged in the field. ACOE transects and data sheets were prepared in the event that a federal permit is required.

The wetland soils at the site are mapped as Ridgebury fine sandy loam (2), Leicester fine sandy loam (6), Walpole sandy loam (13), Scarboro muck (15), and Pootatuck fine sandy loam (102). The Pootatuck series is well drained, but is considered a wetland soil in CT due to its alluvial origin. Non-wetland soils are primarily Paxton and Montauk fine sandy loams (84), Canton and Charlton soils (60), and Hinckley gravelly sandy loam (38). These are well to excessively well-drained soils that are well suited for urban development. There is also a small area mapped as Woodbridge fine sandy loam. This is a moderately-well drained soil that has minor limitations associated with a seasonal high water table atop a compact layer (hardpan). A detailed description of the various soils is attached in an appendix.

PLANT COMMUNITIES – HABITAT TYPES

Five plant communities occur on the parcel: two upland communities—hayfield and mixed hardwood forest; and three wetland communities-- wet meadow/emergent marsh, shrub/scrub swamp and wooded swamp (see Figure 1). A detailed description of each vegetation type follows. There are four wetland units on the site, each of which is described as a whole, though more than one type of vegetation may occur within a unit.

Hayfield

The majority of the site is vegetated predominantly with grass species such as Orchard Grass (*Dactylis glomerata*), Smooth Chess (*Bromus inermis*), and Reed Canarygrass* (*Phalaris aruninacea*). In addition to grasses, the herb layer consists largely of Rough-stemmed Goldenrod (*Solidago rugosa*), Grass-leaved Goldenrod (*Euthamia graminifolia*), Wild Madder (*Galium mollugo*), clovers (*Trifolium spp.*), and Common Milkweed (*Asclepias syriaca*). The fields are hayed regularly. A small field in the northwest corner has been abandoned and is being colonized by woody species such as Multiflora Rose* (*Rosa multiflora*), and Asiatic Bittersweet* (*Celastrus orbiculatus*).

Mixed Hardwood Forest/Hedgerows

This is the most plentiful and characteristic type of vegetation in Connecticut. Our forests are included in the Central Hardwoods-Hemlock zone in a classification of New England forests. Since most of Connecticut has been cleared in the past, forests are called second growth and usually consist of relatively young trees with a diameter at breast height (dbh) of less than one foot.

There are forested patches and hedgerows along the edges of the property and fields and larger areas on the southern and western slopes. The tree layer is mostly oaks (*Quercus*

* Invasive, non-native plant species

spp.), hickory (*Carya spp.*), Black Cherry (*Prunus serotina*), Red Maple (*Acer rubrum*), Sugar Maple (*Acer saccharum*), American Beech (*Fagus granifolia*), Red Cedar (*Juniperus virginiana*), White Pine (*Pinus strobus*), Tree-of-heaven* (*Ailanthus altissima*), and Gray Birch (*Betula populifolia*). The moderately open shrub layer is mostly Multiflora Rose* (*Rosa multiflora*), Morrow's Honeysuckle* (*Lonicera morrowii*), Witch Hazel (*Hamamelis virginiana*), Spicebush (*Lindera benzoin*), Asiatic Bittersweet*, and Japanese Barberry* (*Berberis thunbergii*). The vine layer is mostly Asiatic Bittersweet*. The herb layer includes Garlic Mustard* (*Alliaria petiolata*), Japanese Stiltgrass* (*Microstegium vimineum*), Poison Ivy (*Toxicodendron radicans*), Virginia Creeper (*Parthenocissus quinquefolia*), White Wood Aster (*Eurybia divaricatus*), Hay-scented Fern (*Dennstaedtia punctiloba*), Christmas Fern (*Polystichum acrosticoides*), Haircap Moss (*Polytrichum commune*), sedges (*Carex spp.*), grasses, and goldenrods (*Solidago spp.*).

In the southern forest there is a plantation of White Pine (*Pinus strobus*).

WETLAND VEGETATION TYPES

Three wetland communities occur on the site: wet meadow/emergent marsh, shrub-scrub swamp, and wooded swamp:

(1) Wet meadows and emergent marshes are dominated by persistent and non-persistent grasses, sedges, rushes, and other herbaceous grass-like plants.

(2) Shrub-scrub wetlands are dominated by woody vegetation, shrubs with some scattered stunted trees, less than 20 feet (6 m) in height.

(3) Wooded swamps are the most abundant wetland type in Connecticut and have a vegetational community which is characterized by a forest canopy at least 20 feet (6 m) tall.

The wetlands on the site were divided into 4 separate units for the purpose of evaluation. Wetland Units 1, 2, and 3 drain directly into Deep Brook which is just off site. Wetland Unit 4 is an isolated wetland. All of the wetlands are hillside seeps associated with watercourses except Wetland Unit 4 which dissipates into the ground at its lower end.

Most of the wetlands on the site are wooded swamps with similar vegetation composition. The tree layer consists predominantly of Red Maple with American Elm (*Ulmus americana*), and Green Ash (*Fraxinus pennsylvanica*) also present. The moderately open shrub layer is mostly Spicebush with Winterberry (*Ilex verticillata*), Arrow-wood (*Viburnum dentatum*), Japanese Barberry*, and Multiflora Rose* common. The herb layer is composed primarily of Skunk Cabbage (*Symplocarpus foetidus*), Jewelweed (*Impatiens capensis*), Fowl Mannagrass (*Glyceria striata*), New York Fern (*Thelypteris noveboracensis*), False Hellebore (*Veratrum viride*), Bog Goldenrod (*Solidago uliginosa*), Swamp Dewberry (*Rubus hispidus*), Cinnamon Fern (*Osmunda*

cinnamomea), Sensitive Fern (*Onoclea sensibilis*), Poison Ivy, and Tussock Sedge (*Carex stricta*).

Wetland Unit 1 – Northern Wooded Swamp

Wetland Unit 1 consists of the northern wooded swamp which contains two lobes and drains into a watercourse which flows through a culvert and then into Deep Brook. The southern lobe has a small area of shrub swamp.

Wetland 1 is largely wooded swamp with a small open shrub area which consists mostly of Silky Dogwood (*Cornus amomum*). The intermittent watercourse which drains into Deep Brook has a narrow tree canopy most of which is an upland hedgerow with limited in-stream vegetation.

Wetland Unit 2 – Central Wooded Swamp

Wetland Unit 2 consists of an east-flowing intermittent watercourse which is wooded at the upper end then wet meadow as it flows through a hay field and then into a large wooded swamp. There is a small area of shrub/scrub swamp at the lower end of the wetland. The central wooded swamp flows down-slope into Deep Brook.

Wetland 2 is mostly wooded swamp. Where the intermittent water course flows through the field, the vegetation is wet meadow species consisting mostly of Reed Canarygrass* with Soft Rush (*Juncus effusus*), sedges, Grass-leaved Goldenrod (*Euthamia graminifolia*), and various grasses. Near the eastern end of the wetland the vegetation is shrub/scrub swamp consisting largely of Multiflora Rose*, Autumn Olive* (*Elaeagnus umbellata*), Winterberry, and Silky Dogwood.

Wetland Unit 3 – Deep Brook Wooded Swamp

Wetland Unit 3 consists of several wooded swamp pockets which flank Deep Brook.

Wetland Unit 4-- Isolated Wooded Swamp

Wetland Unit 4 consists of an isolated wet depression in the southern wooded portion of the site. This pocket is a wooded swamp

Specimen Trees

The following specimen trees (large diameter and/or spreading crown) were noted in the field and should be preserved to the maximum extent practicable:

1. White Oak (*Quercus alba*) (approximately 5' diameter at breast height) and 30-40" d.b.h. Shagbark Hickory (*Carya ovata*) located 20' northwest of WL #16
2. Two 30-40" d.b.h. Red Oaks (*Quercus rubra*) located along the northeastern treeline upslope of Deep Brook
3. A large Shagbark Hickory just south of Wetland Unit 2 and the proposed cul-de-sac
4. White Oak located within the proposed cul-de-sac

WETLAND FUNCTIONS AND VALUES

Over the last three decades, ecologists, wetland scientists, biologists, hydrologists, and environmental engineers have recognized not all wetlands perform the same functions, or provide the same values for their various functions. Furthermore, specific attributes of a wetland's hydrology, soils, biota, landscape position, chemistry, etc., can be identified that influence the ability of that wetland to provide a specific function. A variety of functional value assessment methodologies have been developed, to provide a way for a wetland scientist to determine the likelihood that a particular wetland can provide a particular function, and in some cases, the relative magnitude or "value" of that function.

In the New England area, wetlands are frequently evaluated according to the US Army Corps of Engineers Highway Method. This methodology looks at the following thirteen functions: groundwater recharge/discharge, floodwater storage, fish habitat, sediment retention, nutrient removal/retention/transformation, product export, sediment/shoreline stabilization, wetland wildlife habitat, recreational value, educational/scientific value, uniqueness, visual quality/aesthetics, and threatened or endangered species habitat.

Table 1 provides a tabular evaluation of the functions and values of the two wetland units identified on the site. The use of subjective weighting (i.e. high, medium, low) is not part of the Army Corp methodology. It is intended to summarize the narrative results of the functional assessment. The ratings in Table 1 are based on best professional judgment and the experience of EPS staff. The rationale for the ratings shown in Table 1 are stated in narrative form in the "Wetland Functions and Values - narrative" section that follows the table.

Wetland 1

Principal functions and values are groundwater discharge, floodflow alteration, production export, and wetland wildlife habitat. This wetland has the potential function of sediment removal and nutrient transformation, but at present, there are no sources of either sediment or excess nutrients.

Wetland 2

Principal functions and values are groundwater discharge, floodflow alteration, production export, and wetland wildlife habitat. This wetland has the potential function of sediment removal and nutrient transformation, but at present, there are no sources of either sediment or excess nutrients.

Wetland 3

Principal functions and values are groundwater discharge, floodflow alteration, recreation, and wetland wildlife habitat. Since these wetlands flank Deep Book with an existing trail, there are passive recreational and educational opportunities. This wetland has the potential function of sediment removal and nutrient transformation. However, there are currently no sources of either sediment or excessive nutrients.

Wetland 4

This wetland is a small isolated wooded swamp which is seasonally saturated with very limited standing water of short hydroperiod. Principal functions and values are groundwater discharge.

Table 1: Wetland Functions and Values, Newtown Tech Park

Function/Value	Unit 1	Unit 2	Unit 3	Unit 4
Groundwater recharge/discharge	High	High	Moderate	Moderate (discharge)
Floodwater storage	Moderate	Moderate	Moderate	Low
Fish and Shellfish Habitat	N/A	N/A	N/A	N/A
Sediment retention	Moderate (potential)	Moderate (potential)	Moderate (potential)	Low
Nutrient removal/retention/transformation	Moderate (potential)	Moderate-high(potential)	Moderate (potential)	Low
Production Export	Moderate-High	Moderate	Low-moderate	Low
Sediment and Shoreline Stabilization	Low-Moderate	Low-Moderate	N/A	N/A
Wetland wildlife habitat	Moderate-High	Moderate-High	Moderate	Low
Recreation	Low	Low	Moderate	Low
Educational/scientific value	Moderate	Moderate	Moderate	Low
Uniqueness	Low	Low	Low	Low
Visual/Aesthetic Quality	Moderate	Moderate	Moderate	Low
Threatened/Endangered Species Habitat	Low	Low	Low	Low

FUNCTIONAL ASSESSMENT – NARRATIVE

The following section provides a description of each wetland function and value as well as the rationale for the ratings provided in Table 1. Where appropriate, wetland units are evaluated together.

Groundwater Recharge/Discharge

This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers (not necessarily public water supply aquifers), regardless of the size or importance of either.

Wetland Units 1 & 2 – Considerations/Qualifiers

1. Site wetlands are underlain by till (west) and sand & gravel (east)
2. Quality of water associated with wetlands is high
3. Wetland water levels vary (controlled discharge)
4. The wetlands discharge to a perennial stream (Deep Brook)
5. Signs of groundwater discharge are present

Wetland Units 3 & 4 – Considerations/Qualifiers

1. Site wetlands are underlain by till (south) and sand & gravel (north)
2. Portions of the unit discharge to a perennial stream (Deep Brook)
3. Signs of groundwater discharge are present

Floodwater Storage

This function considers the effectiveness of the wetland in reducing flood damage by water retention for long periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas. The floodwater storage capability of wetlands is directly related to wetland topography, hydroperiod (i.e. depth and duration of standing water) and soil type (organic vs. mineral soils).

Wetland Units 1 & 2 – Considerations/Qualifiers

1. Wetlands are small relative to watershed size
2. Site is located in the lower portion of the watershed
3. watershed has a low percentage of impervious surface
4. Wetland grades limit storage capacity
5. Wetland has thick organic soil surface horizons

Wetland Units 3 – Considerations/Qualifiers

1. Site is located in the lower portion of the watershed
2. Watershed has a low percentage of impervious surface
3. Wetland has a slight grade therefore a limited storage capacity
4. Wetland has thick organic soil surface horizons

Wetland Units 4 – Considerations/Qualifiers

1. Wetland has a short hydroperiod
2. Wetland is predominately mineral soils
3. Wetland is not on a level grade therefore has limited storage capacity

Fish Habitat

This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish habitat.

Deep Brook - Considerations/Qualifiers

1. Deep Brook supports native trout species and is a CT DEP Trout Management Area
2. On-site wetlands are not capable of support fish

Sediment/Toxicant/Pathogen Retention

This function reduces or prevents degradation of downstream water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens in runoff from surrounding uplands, or eroding upstream wetlands and/or watercourses.

Wetland Units 1, 2 & 3 - Considerations/Qualifiers

1. No significant upslope sediment sources currently exist
2. Wetlands have a low sediment trapping potential due to steep grades
3. Wetlands are not fed by a perennial watercourse
4. No significant areas of open water are present
5. Wetlands outlet to a perennial watercourse
6. Wetlands contain an organic soil surface horizon

Wetland Unit 4 – Considerations/Qualifiers

1. No significant upslope sediment sources currently exist
2. Wetland has low sediment trapping potential due to relatively steep grades
3. Wetland is not fed by a perennial watercourse
4. Wetland does not outlet to a perennial watercourse
5. No permanent open water occurs in the wetland

Nutrient Removal/Retention/Transformation

This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands, and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries. Wetlands which are highly productive at pollution renovation are typically permanently ponded, contain sinuous, diffuse flows and abundant submergent and emergent wetland vegetation (i.e. deepwater marsh, shallow ponds).

Wetlands 1, 2 & 3 - Considerations/Qualifiers

7. No significant upslope nutrient sources currently exist
8. Wetlands have a low sediment trapping potential due to steep grades
9. Wetlands are not fed by a perennial watercourse
10. No significant areas of open water are present
11. Wetlands outlet to a perennial watercourse
12. Wetlands contain an organic soil surface horizon

Wetland Unit 4 – Considerations/Qualifiers

6. No significant upslope nutrient sources currently exist
7. Wetland has low sediment trapping potential due to relatively steep grades
8. Wetland is not fed by a perennial watercourse
9. Wetland does not outlet to a perennial watercourse
10. No permanent open water occurs in the wetland

Production Export

This function relates to the effectiveness of the wetland to produce food or usable products for humans, or other living organisms.

Wetland Units 1 & 2 – Considerations/Qualifiers

1. Wildlife food sources grow in these wetlands, e.g. fruiting shrubs
2. Detritus development is present in these wetlands
3. Moderate vegetation density is present
4. Nutrients are exported via wetland watercourses

Wetland Units 3 & 4 - Considerations/Qualifiers

5. Wildlife food sources grow in these wetlands, e.g. fruiting shrubs
6. Detritus development is present
7. low-moderate vegetation density is present
8. Wetlands have moderate structural diversity

Wetland Wildlife Habitat

This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. *Note: The evaluation of the wildlife function of these wetlands is based on habitat suitability.*

All Site Wetlands - Considerations/Qualifiers

1. Deep Brook supports fish
2. Water body/wetlands have not been degraded significantly by human activity
3. Water quality of Deep Brook is high
4. Wetland is not fragmented by development
5. Upland surrounding the wetland is predominately undeveloped
6. Wetlands are contiguous with other wetland systems/types
7. Wetland systems have some degree of interspersion
8. Shallow open water areas exist throughout Units 1 & 2
9. Wetland Units 1 & 2 have the potential to support amphibian populations

Recreational Value

This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities.

All Site Wetlands - Considerations/Qualifiers

1. The site's wooded swamps do not offer recreation opportunities
2. Deep Brook is a Trout Management Area used by fly fisherman
3. A trail borders Deep Brook marked "Newtown Trailway"

Educational/Scientific Value

This value considers the suitability of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research.

All Site Wetlands - Considerations/Qualifiers

1. Little or no disturbance is occurring in these wetlands
2. Site wetlands are easily accessible
3. A trail borders Deep Brook marked “Newtown Trailway”. Sign indicates French General Rochambeau and his troops traveled along Deep Brook in 1781.

Uniqueness

This value considers the effectiveness of the wetland or its associated water body to provide certain special values. These may include archeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location.

All Site Wetlands - Considerations/Qualifiers

1. The site’s wetlands consist predominately of wooded swamps, the most abundant wetland type occurring in CT
2. A trail borders Deep Brook marked “Newtown Trailway”. Sign indicates French General Rochambeau and his troops traveled along Deep Brook in 1781.

Visual Quality/Aesthetics

This value relates to the visual and aesthetic qualities of the wetland.

All Site Wetlands - Considerations/Qualifiers

1. No open water vistas are present
2. Land use surrounding the wetlands is undeveloped

Threatened or Endangered Species Habitat

This value relates to the effectiveness of the wetland or associated water bodies to support threatened or endangered species.

Considerations/Qualifiers

1. Wetland is not known to support any state or federally listed species, according to the CT DEP’s Natural Diversity Database
2. Suitable habitat exists on the site for several state-listed species of special concern

STATE-LISTED SPECIES

State-listed species represent species listed as endangered, threatened or special concern by the Connecticut Endangered Species Act. Suitable habitat exists on this site for the following eight species of special concern¹.

Hoary Bat

Hoary bats are solitary and hang among the foliage, but very little is known about the specific habitats of this species (Whitaker and Hamilton 1998). These bats often fly over woodland streams and ponds, but are also often seen feeding on moths around street lights (Whitaker and Hamilton 1998). This site offers suitable roosting and feeding habitat.

*Red Bat*²

The red bat is a solitary tree-roosting bat which feeds in and around trees, over watercourses and at lights (Whitaker and Hamilton 1998). This site represents potential roosting and feeding habitat.

Eastern Box Turtle

In Connecticut, box turtles are restricted to low-lying areas of the state, specifically coastal areas, the Central Connecticut Lowland, and the hilly regions of southwestern Connecticut. The eastern box turtle favors old field habitat and deciduous forest ecotones, including powerline cuts and logged-over woodland. Wetlands are often inhabited by juveniles and by adults during hibernation (Klemens 1993). Box Turtle are known to occur in suitable habitat throughout Newtown and its adjoining towns (Klemens 1993, EPS unpublished data). This site, as well as the surrounding landscape, contains suitable habitat for the box turtle.

Wood Turtle

In Connecticut, this species occurs statewide but is rare in the coastal zone and eastern portions of Windham and New London Counties. Wood turtles require riparian habitats bordered by floodplain, woodland or meadows. In southern New England, wood turtles were found in swift, clear, pebble-bottomed streams, as well as meandering, turbid, muddy water, beaver meadows, fens and wooded swamps. Terrestrial habitats used during the summer include pastures, old fields, woodlands, power line cuts, and railroad beds, bordered on or adjacent to streams or rivers (Klemens 1993). Wood Turtle are known to occur in Newtown, with recent records from the Housatonic and Aspetuck River drainage basins (Klemens 1993). Deep Brook and the adjacent fields and woodlands offer suitable habitat for the Wood Turtle.

¹ “**Species of Special Concern**” means any native plant species or any native nonharvested wildlife species documented by scientific research and inventory to have a naturally restricted range or habitat in the state, to be at a low population level, to be in such high demand by man that its unregulated taking would be detrimental to the conservation of its population or has been extirpated from the state (CT Endangered Species Act).

² This species is listed as “special concern” because little is known about its distribution and occurrence in CT.

American Kestrel

Kestrel inhabit a wide variety of open to semi-open habitats, including meadows, grasslands, deserts, early old field successional communities, open parkland, agricultural fields, and both urban and suburban areas (Bird and Palmer 1988, cited in Smallwood and Bird 2002). The kestrel is an obligate secondary cavity nester, using woodpecker-excavated and natural cavities; and readily accepting nest boxes. Kestrels prefer cavities in large snags (>12 inches d.b.h.) or other structures with entrance not obstructed by overhanging branches (Smallwood and Bird 2002, DeGraaf and Yamasaki 2001). The site's fields, old fields and forest edges provide suitable habitat for the Kestrel.

Bobolink

Bobolink originally nested in tall-grass or mixed-grass prairie of midwestern U.S. and s.-central Canada (Bent 1958, as cited in Martin and Gavin 1995). Most of this area came under intensive agriculture more than a century ago, but by that time the vast deciduous forests of the eastern U.S. had been cleared, providing habitat in hay fields and meadows. Bobolinks continue to use and may prefer fields in the eastern U.S. comprised of a mixture of grasses and broad-leaved forbs (e.g., red clover [*Trifolium pratense*], dandelion [*Taraxacum officinale*]). Specifically, density is significantly higher in fields in w.-central New York with relatively low amounts of total vegetative cover, low alfalfa (*Medicago sativa*) cover, and low total legume cover but with high litter cover and high grass-to-legume ratios relative to other nearby fields (Bollinger 1988a, Bollinger and Gavin 1992 as cited in Martin and Gavin 1995). These vegetative characteristics occur in hay fields in New York that are ≥ 8 yr old (time since last plowing and reseeded; Bollinger and Gavin 1992, as cited in Martin and Gavin 1995). These "old" hay fields contain significantly higher densities of Bobolinks than hay fields < 8 yr old, or than any of 3 other types of fields or pastures sampled. Also, large fields have higher densities than small fields; fields ≥ 30 ha support more than twice the number of males per 100 m of transect than fields ≤ 10 ha (Bollinger and Gavin 1992, as cited in Martin and Gavin 1995).

The habitat value of this site for Bobolink is limited by three factors:

1. the small size of the fields.
2. the regular haying/early successional status, and
3. The timing at which mowing occurs. Mowing prior to mid-July would destroy nests and kill nestlings.

Based on these factors, the site represents marginal quality habitat for Bobolink.

Brown Thrasher

Found in dry, open country along coastal plain of Long Island, NY, especially in thickets and scrubby fields; in western New York, prefers brushy hillsides covered with hawthorn (*Crataegus* sp.; Bull 1974, as cited in Cavitt and Haas 2000). In New Jersey pine barrens, breeds at high densities in regularly burned habitat dominated by pitch pine (*Pinus rigida*) and scrub oaks (bear [*Quercus ilicifolia*] and black jack oak [*Q. marilandica*]) but absent or rare in areas where fire sup-pression allows canopy oaks (scarlet [*Q. coccinea*] or white [*Q. alba*] oaks) to dominate (Kerlinger and Doremus 1981, as cited in Cavitt and

Haas 2000). Not found breeding in New Jersey woodlots <0.8 ha in size and rare in woodlots of <4 ha (Forman et al. 1976, as cited in Cavitt and Haas 2000). Although uses a wide variety of habitats, reaches highest densities in shrub or midsuccessional stages of forests (Cade 1986, as cited in Cavitt and Haas 2000). The old field and hayfield edge portions of the site offer suitable breeding habitat for the Brown Thrasher.

Northern Saw-whet Owl

Throughout most of its range, and in Connecticut, the breeding habitat of the Northern Saw-whet Owl is poorly defined. Conifer woodlands or mixed deciduous and conifer woodlands, often near wetlands, are the most commonly used habitat, provided trees with natural cavities are available for nesting (Bevier 1994). The site's White Pine grove, deciduous woods and forested wetlands offer potentially suitable habitat for the Saw-whet Owl.

FISHERIES HABITAT

Deep Brook is one of the CT Department of Environmental Protection's Trout Management Areas (TMA). These are considered high-quality fisheries, offering year-round fishing opportunities. Deep Brook is classified as a Class 1 Wild Trout Management Area (WTMA) in which wild Brook Trout (*Salvelinus fontinalis*) and Brown Trout (*Salmo trutta*)³ are self-sustaining, and no hatchery-raised trout are stocked. Protection of habitat and water quality in Deep Brook is a primary design criterion for the industrial park.

NATURAL DIVERSITY DATABASE REVIEW

The Connecticut Department of Environmental Protection's Natural Diversity Database program represents current documented data showing the known locations of any endangered, threatened or special concern species and significant natural communities. Submission to the database for information regarding a given site is done if the subject site:

1. Occurs within a designated NDDB area
2. Overlaps a waterbody that has been designated a NDDB area
3. Is upstream or downstream (by less than ½ a mile) from a NDDB area

The most recent maps dated December 2006 were reviewed. The northeast corner of the subject site occurs within a NDDB area (criteria 1 noted above). Therefore, an information request was made to the DEP's Natural Diversity Database Program regarding review of the proposed activities. A response from the CT DEP NDDB program was received on June 13, 2006 and stated that there are "no known extant populations of federal or state endangered, threatened or special concern species at the site in question".

³ The Brown Trout is an introduced species in Connecticut. It is native to Europe and Western Asia.

WILDLIFE INVENTORY

The wildlife inventory (Table 2) was developed by determining that suitable habitat exists on the site for a given species. The list was revised using current data on species ranges in Connecticut. While efforts were made to review the suitability of this site for all potential wildlife species, this inventory is not a comprehensive list.

Table 2: Wildlife Inventory, Commerce Road, Newtown

KEY

Habitat Types: (1) forested wetland; (2) hayfield; (3) mixed hardwood forest; (4) hemlock-white pine woodland; (5) old field; (6) Deep Brook (stream and bank)

Seasonal Use: (M) migrant; (WR) winter resident; (R) year-round resident

Site Use:

(1) Observed – species was observed on the site.

(2) Probable Site User – species is known to inhabit the geographic area and suitable habitat exists on the site.

(3) Possible Site User – species is known to inhabit the geographic area and marginal habitat exists on the site.

(4) Confirmed Breeder –Birds only; confirmation of breeding was observed (presence of nests, nestlings, etc.)

(W) Winter Site User

(M) Migrant Site User

(/) Edge Habitat User

(AP) Observed on an adjacent Property

(*) State Listed Species – species is listed as special concern by the Connecticut Department of Environmental Protection.

Birds

Common Name	Scientific Name	Habitat	Site Use
Acadian Flycatcher	<i>Empidonax vireescens</i>	6	2
Alder Flycatcher	<i>Empidonax alnorum</i>	1,6	2
American Crow	<i>Corvus brachyrhynchos</i>	1,2,3,4	2
American Goldfinch	<i>Carduelis tristis</i>	2/,5	2
American Kestrel*	<i>Falco sparverius</i>	2/,5	2
American Redstart	<i>Setophaga ruticilla</i>	3,3/	2
American Robin	<i>Turdus migratorius</i>	3	2
American Woodcock	<i>Scolopax minor</i>	2,5	2
Barn Swallow	<i>Hirundo rustica</i>	2,5	2
Barred Owl	<i>Strix varia</i>	2,4,5	2
Black-and-white Warbler	<i>Mniotilta varia</i>	3,4	2
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	2/,3/,5	2
Black-capped Chickadee	<i>Parus atricapillus</i>	3,4	2
Blue Jay	<i>Cyanocitta cristata</i>	2/,3,5	2
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	2,3,5	2
Bobolink*	<i>Dolichonyx oryzivorus</i>	2	3
Broad-winged Hawk	<i>Buteo platypterus</i>	3	3
Brown Creeper	<i>Certhia americana</i>	1,3,4	2
Brown Thrasher*	<i>Toxostoma rufum</i>	2/,5	2
Brown-headed Cowbird	<i>Molothrus ater</i>	2,3,5	2
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	3/,5	2
Chimney Swift	<i>Chaetura pelagica</i>	2,5	2

Chipping Sparrow	<i>Spizella passerina</i>	2/,3/,5	2
Cooper's Hawk	<i>Accipiter cooperii</i>	2/,5/	2
Downy Woodpecker	<i>Picoides pubescens</i>	1,2,4	2
Eastern Bluebird	<i>Sialia sialis</i>	2,5	2
Eastern Kingbird	<i>Tyrannus tyrannus</i>	2,5	2
Eastern Phoebe	<i>Sayornis phoebe</i>	2/,5/	2
Eastern Screech-Owl	<i>Otus asio</i>	4	2
Eastern Wood-Pewee	<i>Contopus virens</i>	3,4	2
European Starling	<i>Sturnus vulgaris</i>	1,2,3,4,5	2
Field Sparrow	<i>Spizella pusilla</i>	2,5	2
Gray Catbird	<i>Dumetella carolinensis</i>	2/,5/	2
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	3,2/,5/	2
Great Horned Owl	<i>Bubo virginianus</i>	2/,5/,3,4	2
Hairy Woodpecker	<i>Picoides villosus</i>	1,3,4	2
Hermit Thrush	<i>Catharus guttatus</i>	3	2
House Wren	<i>Troglodytes aedon</i>	2,5	2
Killdeer	<i>Charadrius vociferus</i>	2	3
Louisiana Waterthrush	<i>Seiurus motacilla</i>	6	2
Magnolia Warbler	<i>Dendroica magnolia</i>	4	2
Mourning Dove	<i>Zenaida macroura</i>	2/,5/,3	2
Northern Cardinal	<i>Cardinalis cardinalis</i>	2/,3,5/	2
Northern Flicker	<i>Colaptes auratus</i>	2/,3,5/	2
Northern Mockingbird	<i>Mimus polyglottos</i>	2/,5	2
Northern Oriole	<i>Icterus galbula</i>	2/,5/,3/	2
Northern Saw-whet Owl*	<i>Aegolius acadicus</i>	4,1/	2
Northern Waterthrush	<i>Seiurus noveboracensis</i>	1,6	2
Orchard Oriole	<i>Icterus spurius</i>	2/,5	2
Ovenbird	<i>Seiurus aurocapillus</i>	3	2
Pileated Woodpecker	<i>Dryocopus pileatus</i>	3,4	2
Pine Warbler	<i>Dendroica pinus</i>	4	2
Purple Finch	<i>Carpodacus purpureus</i>	4	2
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	3	2
Red-eyed Vireo	<i>Vireo olivaceus</i>	3	2
Red-tailed Hawk	<i>Buteo jamaicensis</i>	3	2
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	3	2
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	2/,5	2
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	3	2
Tree Swallow	<i>Tachycineta bicolor</i>	2,5	2
Tufted Titmouse	<i>Parus bicolor</i>	3	2
Turkey Vulture	<i>Cathartes aura</i>	2,3,5	2
White-breasted Nuthatch	<i>Sitta carolinensis</i>	3	2
Wild Turkey	<i>Meleagris gallopavo</i>	2,3,5	2
Winter Wren	<i>Troglodytes troglodytes</i>	6	2
Wood Thrush	<i>Hylocichla mustelina</i>	3	2
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	3	2
Yellow-rumped Warbler	<i>Dendroica coronata</i>	4	2
Yellow-throated Vireo	<i>Vireo flavifrons</i>	3	2
Reptiles and Amphibians			
Black Rat Snake	<i>Elaphe o. obsoleta</i>	3	2
Eastern Box Turtle*	<i>Terrapene Carolina</i>	1,2,3,4,5	2
Eastern Garter Snake	<i>Thamnophis sirtalis</i>	1,2,3,4,5	2
Eastern Milk Snake	<i>Lampropeltis triangulum</i>	2,3,5	2
Eastern Worm Snake	<i>Carphophis amoenus</i>	2,3,4,5	2

Four-toed Salamander	<i>Hemidactylum scutatum</i>	1	2
Gray Treefrog	<i>Hyla versicolor</i>	1	3
Green Frog	<i>Rana clamitans</i>	1,6	2
Green Snake	<i>Opheodrys vernalis</i>	2,3	2
Marbled Salamander	<i>Ambystoma opacum</i>	1	2
Northern Black Racer	<i>Coluber constrictor</i>	2,5	2
Northern Brown Snake	<i>Storeria dekayi</i>	2,3,5	2
Northern Dusky Salamander	<i>Desmognathus fuscus</i>	1	2
Northern Ringneck Snake	<i>Diadophis p. edwardsii</i>	1,2,3,4,5	2
Northern Water Snake	<i>Nerodia sipedon</i>	7	2
Pickerel Frog	<i>Rana palustris</i>	1	2
Redback Salamander	<i>Plethodon cinereus</i>	3,4	2
Spotted Salamander	<i>Ambystoma maculatum</i>	1,3	2
Spotted Turtle	<i>Clemmys guttata</i>	1,2,3,5	2
Spring Peeper	<i>Pseudacris crucifer</i>	1	3
Two-lined Salamander	<i>Eurycea bislineata</i>	1	2
Wood Frog	<i>Rana sylvatica</i>	1,3	2
Wood Turtle*	<i>Clemmys insculpta</i>	1,3,5,6	2
Mammals			
Big Brown Bat	<i>Eptesicus fuscus</i>	1,2,3,4,5,6	2
Bobcat	<i>Lynx rufus</i>	1,2,3,4,5	2
Coyote	<i>Canis latrans</i>	1,2,3,4,5	2
Deer Mouse	<i>Peromyscus maniculatus</i>	3	2
Eastern Chipmunk	<i>Tamias striatus</i>	3	2
Eastern Cottontail	<i>Sylvilagus floridanus</i>	2/3,5	2
Eastern Mole	<i>Scalopus aquaticus</i>	2,3,4,5	2
Eastern Pipistrelle	<i>Pipistrellus subflavus</i>	1,2,3,4,5	2
Ermine	<i>Mustela erminea</i>	2/3,4,5	2
Gray Fox	<i>Urocyon cinereoargenteus</i>	1,2,3,4,5	2
Gray Squirrel	<i>Sciurus carolinensis</i>	3	2
Hoary Bat*	<i>Lasiurus cinereus</i>	2,3,5,6	2
Little Brown Myotis	<i>Myotis lucifugus</i>	2,3,5,6	2
Long-tailed Weasel	<i>Mustela frenata</i>	1,2/3,4,5	2
Masked Shrew	<i>Sorex cinereus</i>	1,2,3	2
Meadow Jumping Mouse	<i>Zapus hudsonius</i>	2,5	2
Meadow Vole	<i>Microtus pennsylvanicus</i>	2,5	2
Northern Myotis	<i>Myotis septentrionalis</i>	1,2,3,4,5,6	2
Northern Short-tailed Shrew	<i>Blarina brevicauda</i>	1,2,3,4,5	2
Raccoon	<i>Procyon lotor</i>	1,2,3,4,5,6	2
Red Bat*	<i>Lasiurus borealis</i>	1,2,3,4,5,6	2
Red Fox	<i>Vulpes vulpes</i>	1,2,3,4,5,6	2
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	4	2
Smoky Shrew	<i>Sorex fumeus</i>	1,3,4	2
Southern Flying Squirrel	<i>Glaucomys volans</i>	3	2
Star-nosed Mole	<i>Condylura cristata</i>	1	2
Striped Skunk	<i>Mephitis mephitis</i>	1,2,3,4,5	2
Virginia Opossum	<i>Didelphis virginiana</i>	3	2
Water Shrew	<i>Sorex palustris</i>	7	2
White-footed Mouse	<i>Peromyscus leucopus</i>	2/3/5	2
White-tailed Deer	<i>Odocoileus virginianus</i>	1,2,3,4,5	2
Woodchuck	<i>Marmota monax</i>	2,5	2
Woodland Vole	<i>Microtus pinetorum</i>	3	2

In summary, the site presently is a mosaic of hayfields and wooded wetlands, with some minor wooded non-wetland habitat and minor wet meadow habitat. Four wetland units were identified; three of which drain into Deep Brook, which lies just off-site to the south and east. The three wetlands which are tributary to Deep Brook provide a range of functions and values and would generally be considered to be of moderate quality. The fourth is an isolated wetland that provides mostly low quality values for most wetland functions.

As might be expected, this site is considered likely to support a diverse wildlife population, and has the potential to support several state-listed species. However, there are no documented occurrences of state-listed species at the site.

Design and development of the site should recognize two primary natural resource protection goals; minimization of wetland impacts, and protection of water quality in Deep Brook. Since Deep Brook is a designated Wild Trout Management Area, control of thermal pollution and dissolved contaminants in stormwater runoff should be considered, as well as conventional total suspended solids control. Accordingly, direct discharge to Deep Brook should be avoided to the maximum extent practicable. Development of a riparian corridor along the portion of the property adjacent to Deep Brook should be an important design criterion. The existing riparian corridor is of limited width in some areas due to agricultural and other activity. This corridor can be enhanced with additional area and plantings. Long term management is important to control invasive plants and to enhance fish and wildlife habitat, recreation, and aesthetics.

RECOMMENDATIONS

EPS reviewed several alternative site layout and stormwater management schemes and made several recommendations:

1. The existing wetland corridors tributary to Deep Brook are essentially intact as they cross the site. The road network should avoid bisecting these corridors to the maximum extent possible, consistent with public safety concerns.
2. Any wetland crossings should minimize hydrologic alteration and provide wildlife access along the stream/wetland corridors. This is often most easily accomplished via concrete arch culverts, and siting of stormwater management facilities outside of wetlands.
3. Provide mechanical treatment of stormwater to remove suspended solids, followed by final polishing of the first flush by biological and soils treatment. Thermal pollution can be effectively prevented by infiltration of the first flush into the groundwater, which provides an essentially unlimited heat-sink.
4. Manage the riparian corridor along Deep Brook by establishing a multi-zone approach similar to the NRCS model.
5. Stormwater polishing facilities can be located in the outer portions of the corridor provided that they are stabilized early in the construction process with native vegetation.

6. Long term management of the corridor will require periodic control of invasive plants, given their distribution and abundance in the surrounding landscape.
7. We have prepared a planting plan, plant list and construction sequence (attached) for use in re-vegetating the stormwater polishing facility and other necessary facilities located near wetlands and Deep Brook. It uses native plants and requires oversight by a biologist.
8. All wetland areas not in the proposed Open Space should be protected by a conservation easement.
9. It would be advantageous to manage some areas as meadow, which will require periodic mowing. Such mowing should occur in early-mid spring or late summer, no more frequently than annually.
10. Implement a design restriction on exterior lighting that complies with the model ordinance for New England developed by the New England Light Pollution Advisory Group (copy attached).
11. Site landscaping plans shall not include any plants designated as invasive on the then current list maintained by the CT Invasive Plant Working Group.

Implementation of these recommendations into the final design will minimize the potential for adverse impacts on wetlands and Deep Brook. Water quality and flooding impacts can be effectively minimized by proper engineering measures. Any conversion of the site from hayfield to a developed use will have some impacts on wildlife. Certain disturbance tolerant species will be favored over disturbance in-tolerant species. The site does not contain large expanses of intact forest that would be adversely affected by fragmentation. Indirect impacts in the open space can be mitigated by imposition of conservation restrictions, native landscaping requirements, and prohibition of use of invasive species in landscaping throughout the property.

APPENDICES

BUFFER PLANTING PLAN
Newtown Tech Park
Newtown, Connecticut
Prepared by
Environmental Planning Services

PLANT NOTES

- 1. Topsoil and mulch to be used in the wetland planting areas shall be inspected and determined to be free from Purple Loosestrife (*Lythrum salicaria*), Common Reed (*Phragmites australis*), or Reed Canarygrass (*Phalaris arundinacea*).**
- 2. Infiltration basin soil mix shall consist of 60% sand, 20% topsoil, and 20% peat.**
- 3. Infiltration basin soil mix shall be placed in the basin bottom at a depth of 18"-30".**
- 4. Compaction of the infiltration basin and required backfill shall be minimized to the maximum extent feasible by the use of excavation hoes, light equipment with turf type tires, or wide track equipment.**
- 5. If compaction does occur in the infiltration basin, the compacted zone shall be tilled to refracture at least 12" of natural soil before backfilled with soil mix.**
- 6. When backfilling Infiltration basin, place soil in lifts of 12-18" and use light equipment only when grading within the garden. Heavy equipment can be used around the perimeter of the basin.**
- 7. Allow soil mixture to settle naturally through rain events or presoak after placement.**
- 8. Final plant & seed mix locations should be determined in the field by EPS staff.**
- 9. Plant shrubs in beds and mulch with pine bark mulch or equivalent. Do not seed shrub beds.**
- 10. Plant Trumpet Honeysuckle vines next to shrubs for support.**
- 11. Plant one male Winterberry in each grouping at a ratio of 1 male per 5 female.**
- 12. Plant trees and mulch with pine bark mulch or equivalent. Do not renew unless directed by EPS staff.**
- 13. Seed sediment and infiltration basins with New England Erosion Control/Restoration Mix (for detention basins and moist sites) at 1 lb/1245 s.f.**
- 14. Seed graded slopes on Lot 9, upper and outer slopes of the infiltration basin, and disturbed soils with New England Conservation/Wildlife Mix at 1 lb/1743sq ft.**
- 15. No substitutions without review and approval by EPS staff. No cultivars to be used without express approval by EPS staff.**
- 16. Plantings shall be monitored by EPS staff for 3 years. Remedial measures may be required and shall be implemented as directed by EPS staff.**

**Buffer Plant List
Newtown Tech Park
Newtown, CT**

Trees	Scientific Name	Common Name	Quan	Size
AR	Acer rubrum	Red Maple	22	6'
BP	Betula papyrifera	Paper Birch	6	6'
CE	Celtis occidentalis	Common Hackberry	12	4-6'
CF	Cornus florida	Flowering Dogwood	10	6'
Jv	Juniperus virginica	Red Cedar	13	6'
NS	Nyssa sylvatica	Black Gum	12	6'
Ps	Pinus strobus	White Pine	21	6'
PT	Populus tremuloides	Quaking Aspen	21	4-6'
PV	Prunus virginiana	Chokecherry	14	4-6'
QA	Quercus alba	White Oak	16	6'
		Total	147	
Shrubs				
AC	Amelanchier canadensis	Shadblow	14	3-4'
AM	Aronia melanocarpa	Black Chokeberry	12	3-4'
CA	Comus amomum	Silky Dogwood	12	3-4'
CR	Cornus racemosa	Gray Dogwood	42	3-4'
HV	Hamamelis virginiana	Witch Hazel	18	3-4'
IV	Ilex verticillata (female)	Winterberry (female)	56	3-4'
IV	Ilex verticillata (male)	Winterberry (male)	12	3-4'
MP	Morella (Myrica) pennsylvanica*	Bayberry*	34	3-4'
SD	Salix discolor	Pussy Willow	6	3-4'
SC	Sambucus canadensis	Common Elderberry	6	3-4'
SL	Spiraea latifolia	Meadowsweet	24	2-3'
VC	Vaccinium corymbosum	Highbush Blueberry	48	3-4'
VD	Viburnum dentatum	Arrow-wood	12	3-4'
VL	Viburnum lentago	Nannyberry	12	3-4'
VP	Viburnum prunifolium	Black Haw Viburnum	15	3-4'
		Total	323	
Vines				
LS	Lonicera sempervirens	Trumpet Honeysuckle	18	1 gal.
		Total	18	

* = do not plant in the fall

Seed Mixes

New England Erosion Control/Restoration Mix (basin bottoms and inner slope)

New England Conservation/Wildlife Mix (basin outer slopes & fill slope)
(Above seed from New England Wetland Plants)

MODEL OUTDOOR LIGHTING ORDINANCE

STATEMENT OF NEED AND PURPOSE: Good outdoor lighting at night benefits everyone. It increases safety, enhances the Town's night time character, and helps provide security. New lighting technologies have produced lights that are extremely powerful, and these types of lights may be improperly installed so that they create problems of excessive glare, light trespass, and higher energy use. Excessive glare can be annoying and may cause safety problems. Light trespass reduces everyone's privacy, and higher energy use results in increased costs for everyone. There is a need for a lighting ordinance that recognizes the benefits of outdoor lighting and provides clear guidelines for its installation so as to help maintain and compliment the Town's character. Appropriately regulated, and properly installed, outdoor lighting will contribute to the safety and welfare of the residents of the Town.

This ordinance is intended to reduce the problems created by improperly designed and installed outdoor lighting. It is intended to eliminate problems of glare, minimize light trespass, and help reduce the energy and financial costs of outdoor lighting by establishing regulations which limit the area that certain kinds of outdoor-lighting fixtures can illuminate and by limiting the total allowable illumination of lots located in the Town of Anytown. All business, residential, and community driveway, sidewalk, and property luminaires should be installed with the idea of being a "good neighbor", with attempts to keep unnecessary direct light from shining onto abutting properties or streets.

ARTICLE 1

1.1. DEFINITIONS: For the purposes of this Ordinance, terms used shall be defined as follows:

Direct Light: Light emitted directly from the lamp, off of the reflector or reflector diffuser, or through the refractor or diffuser lens, of a luminaire.

Fixture: The assembly that houses the lamp or lamps and can include all or some of the following parts: a housing, a mounting bracket or pole socket, a lamp holder, a ballast, a reflector or mirror, and/or a refractor or lens.

Flood or Spot light: Any light fixture or lamp that incorporates a reflector or a refractor to concentrate the light output into a directed beam in a particular direction.

Fully-shielded lights: outdoor light fixtures shielded or constructed so that no light rays are emitted by the installed fixture at angles above the horizontal plane as certified by a photometric test report.

Glare: Light emitting from a luminaire with an intensity great enough to reduce a viewer's ability to see, and in extreme cases causing momentary blindness.

Grandfathered luminaires: Luminaires not conforming to this code that were in place at the time this code was voted into effect. When an ordinance "grandfathers" a luminaire, it means that such already-existing outdoor lighting does not need to be changed unless a specified period is specified for adherence to the code.

Height of Luminaire: The height of a luminaire shall be the vertical distance from the ground directly below the centerline of the luminaire to the lowest direct-light-emitting part of the luminaire.

Indirect Light: Direct light that has been reflected or has scattered off of other surfaces.

Lamp: The component of a luminaire that produces the actual light.

Light Trespass: The shining of light produced by a luminaire beyond the boundaries of the property on which it is located.

Lumen: A unit of luminous flux. One footcandle is one lumen per square foot. For the purposes of this Ordinance, the lumen-output values shall be the INITIAL lumen output ratings of a lamp.

Luminaire: This is a complete lighting system, and includes a lamp or lamps and a fixture.

Outdoor Lighting: The night-time illumination of an outside area or object by any man-made device located outdoors that produces light by any means.

Temporary outdoor lighting: The specific illumination of an outside area of object by any man-made device located outdoors that produces light by any means for a period of less than 7 days, with at least 180 days passing before being used again.

ARTICLE 2

2.1. REGULATIONS: All public and private outdoor lighting installed in the Town of Anytown shall be in conformance with the requirements established by this Ordinance. All previous language in Anytown bylaws and ordinances regarding outdoor lighting is replaced with this ordinance.

2.2. CONTROL OF GLARE -- LUMINAIRE DESIGN FACTORS:

A. Any luminaire with a lamp or lamps rated at a total of MORE than 1800 lumens, and all flood or spot luminaires with a lamp or lamps rated at a total of MORE than 900 lumens, shall not emit any direct light above a horizontal plane through the lowest direct-light-emitting part of the luminaire.

B. Any luminaire with a lamp or lamps rate at a total of MORE than 1800 lumens, and all flood or spot luminaires with a lamp or lamps rated at a total of MORE than 900 lumens, shall be mounted at a height equal to or less than the value $3 + (D/3)$, where D is the distance in feet to the nearest property boundary. The maximum height of the luminaire may not exceed 25 feet.

2.3. EXCEPTIONS TO CONTROL OF GLARE:

A. Any luminaire with a lamp or lamps rated at a total of 1800 lumens or LESS, and all flood or spot luminaires with a lamp or lamps rated at 900 lumens or LESS, may be used without restriction to light distribution or mounting height, except that if any spot of flood luminaire rated 900 lumens or LESS is aimed, directed, or focused such as to cause direct light from the luminaire to be directed toward residential buildings on adjacent or nearby land, or to create glare perceptible to persons operating motor vehicles on public ways, the luminaire shall be redirected or its light output controlled as necessary to eliminate such conditions.

B. Luminaires used for public-roadway illumination may be installed at a maximum height of 25 feet and may be positioned at that height up to the edge of any bordering property.

C. All temporary emergency lighting need by the the Police or Fire Departments or other emergency services, as well as all vehicular luminaires, shall be exempt from the requirements of this article.

D. All hazard warning luminaires required by Federal regulatory agencies are exempt from the requirements of this article, except that all luminaires used must be red and must be shown to be as close as possible to the Federally required minimum lumen output requirement for the specific task.

E. Luminaires used primarily for sign illumination may be mounted at any height to a maximum of 25 feet, regardless of lumen rating.

F. Law Governing Conflicts. Where any provision of federal, state, county, or town statutes, codes, or laws conflicts with any provision of this code, the most restrictive shall govern unless otherwise regulated by law.

2.4. OUTDOOR ADVERTISING SIGNS.

A. Top Mounted Fixtures Required. Lighting fixtures used to illuminate an outdoor advertising sign shall be mounted on the top of the sign structure. All such fixtures shall comply with the shielding requirements of Section 2.2. Bottom-mounted outdoor advertising-sign lighting shall not be used.

B. Outdoor advertising signs of the type constructed of translucent materials and wholly illuminated from within do not require shielding. Dark backgrounds with light lettering or symbols are preferred, to minimize detrimental effects. Unless conforming to the above dark background preference, total lamp wattage per property shall be less than 41 watts.

C. Compliance Limit. Existing outdoor advertising structures shall be brought into conformance with this Code within ten years from the date of adoption of this provision.

D. Prohibitions. Electrical illumination of outdoor advertising off-site signs between the hours of 11:00 p.m. and sunrise is prohibited.

2.5. RECREATIONAL FACILITIES.

A. Any light source permitted by this Code may be used for lighting of outdoor recreational facilities (public or private), such as, but not limited to, football fields, soccer fields, baseball fields, softball fields, tennis courts, or show areas, provided all of the following conditions are met:

a. All fixtures used for event lighting shall be fully shielded as defined in Section 2.2 of this Code, or be designed or provided with sharp cut-off capability, so as to minimize up-light, spill-light, and glare.

b. All events shall be scheduled so as to complete all activity before or as near to 10:30 p.m. as practical, but under no circumstances shall any illumination of the playing field, court, or track be permitted after 11:00 p.m. except to conclude a scheduled event that was in progress before 11:00 p.m. and circumstances prevented concluding before 11:00 p.m.

2.6. PROHIBITIONS.

A. Laser Source Light. The use of laser source light or any similar high intensity light for outdoor advertising or entertainment, when projected above the horizontal is prohibited.

B. Searchlights. The operation of searchlights for advertising purposes is prohibited.

C. Outdoor Advertising Off-Site Signs. Electrical illumination of outdoor advertising off-site signs is prohibited between the hours of 11:00 p.m. and sunrise.

2.7. TEMPORARY OUTDOOR LIGHTING.

A. Any temporary outdoor lighting that conforms to the requirements of this Ordinance shall be allowed. Nonconforming temporary outdoor lighting may be permitted by the Board of Selectmen after considering: (1) the public and/or private benefits that will result from the temporary lighting; (2) any annoyance or safety problems that may result from the use of the temporary lighting; and (3) the duration of the temporary nonconforming lighting. The applicant shall submit a detailed description of the proposed temporary nonconforming lighting to the Board of Selectmen, who shall consider the request at a duly called meeting of the Board of Selectmen. Prior notice of the meeting of the Board of Selectmen shall be given to the applicant and to the Anytown Lighting Committee. The Board of Selectmen shall render its decision on the temporary lighting request within two weeks of the date of the meeting. A failure by the Board of Selectmen to act on a request within the time allowed shall constitute a denial of the request.

ARTICLE 3

3.1. EFFECTIVE DATE AND GRANDFATHERING OF NONCONFIRMING LUMINAIRES:

A. This ordinance shall take effect immediately upon approval by the voters of the Town of Anytown at an annual or special Town Meeting and shall supersede and replace all previous ordinances pertaining to outdoor lighting.

B. All luminaires lawfully in place prior to the date of the Ordinance shall be grandfathered. However, any luminaire that replaces a grandfathered luminaire, or any grandfathered luminaire that is moved, must meet the standards of this Ordinance. Advertising signs are grandfathered only for a period of ten years, as specified in section 2.4.C.

C. Grandfathered luminaires that direct light toward streets or parking lots that cause disability glare to motorists or cyclists should be either shielded or re-directed within 90 days of notification, so that the luminaires do not cause a potential hazard to motorists or cyclists.

ARTICLE 4

4.1. NEW SUB-DIVISION CONTRUCTION.

A. Submission Contents. The applicant for any permit required by any provision of the laws of this jurisdiction in connection with proposed work involving outdoor lighting fixtures shall submit (as part of the application for permit) evidence that the proposed work will comply with this Code. The submission shall contain but shall not necessarily be limited to the following, all or part of which may be part or in addition to the information required elsewhere in the laws of this jurisdiction upon application for the required permit: plans indicating the location on the premises, and the type of illuminating devices, fixtures, lamps, supports, reflectors, and other devices; description of the illuminating devices, fixtures, lamps,

supports, reflectors, and other devices and the description may include, but is not limited to, catalog cuts by manufacturers and drawings (including sections where required); photometric data, such as that furnished by manufacturers, or similar showing the angle of cut off or light emissions.

B. Additional Submission. The above required plans, descriptions and data shall be sufficiently complete to enable the plans examiner to readily determine whether compliance with the requirements of this Code will be secured. If such plans, descriptions and data cannot enable this ready determination, by reason of the nature or configuration of the devices, fixtures, or lamps proposed, the applicant shall additionally submit as evidence of compliance to enable such determination such certified reports of tests as will do so provided that these tests shall have been performed and certified by a recognized testing laboratory.

C. Subdivision Plat Certification. If any subdivision proposes to have installed street or other common or public area outdoor lighting, the final plat shall contain a statement certifying that the applicable provisions of the Town of Anytown Outdoor Lighting Code will be adhered to.

D. Lamp or Fixture Substitution. Should any outdoor light fixture, or the type of light source therein, be changed after the permit has been issued, a change request must be submitted to the building official for his approval, together with adequate information to assure compliance with this code, which must be received prior to substitution.

ARTICLE 5

5.1. NOTIFICATION REQUIREMENTS:

A. The Town of Anytown building permit shall include a statement asking whether the planned project will include any outdoor lighting.

B. Within 30 days of the enactment of this ordinance, the Code Enforcement Officer shall send a copy of the Outdoor Lighting Ordinance, with cover letter to all local electricians and local electric utility (including at least those in the Towns of Anytown, [list immediately-adjacent towns here], as listed in the Yellow Pages).

ARTICLE 6

6.1. VIOLATIONS, LEGAL ACTIONS, AND PENALTIES:

A. Violation. It shall be a civil infraction for any person to violate any of the provisions of this Code. Each and every day during which the violation continues shall constitute a separate offense.

B. Violations and Legal Actions: If, after investigation, the Code Enforcement Officer finds that any provision of the Ordinance is being violated, he shall give notice by hand delivery or by certified mail, return-receipt requested, of such violation to the owner and/or to the occupant of such premises, demanding that violation be abated within thirty (30) days of the date of hand delivery or of the date of mailing of the notice. If the violation is not abated within the thirty-day period, the Code Enforcement Officer may institute actions and proceedings, either legal or equitable, to enjoin, restrain, or abate any violations of this Ordinance and to collect the penalties for such violations.

C. Penalties: A violation of this Ordinance, or any provision thereof, shall be punishable by a civil penalty of not less than fifty

dollars nor more than one thousand dollars for any individual (and not more than ten thousand dollars for any corporation, association, or other legal entity) for each violation. The imposition of a fine under this Code shall not be suspended. Each day of violation after the expiration of the thirty-day period provided in paragraph B shall constitute a separate offense for the purpose of calculating the civil penalty.

Source: New England Light Pollution Working Group

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