# *Wetland Mitigation Monitoring Report 10*

***CT DEEP Permits IW-2003-112 and WQC-200302988*** ***2017***

## Landfill Closure
## Project # 900748

# University of Connecticut
## Storrs, Connecticut

View Northwest, October 3, 2017


**MASON & ASSOCIATES, INC.**
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857 Telephone (401) 647-3835

***In association with***

**HALEY & ALDRICH, INC.**
100 Corporate Place, Suite 105 Telephone
Rocky Hill, Connecticut 06067 (860) 290-3131

# WETLAND MITIGATION MONITORING REPORT 10 - 2017

## LANDFILL CLOSURE PROJECT #900748
## UNIVERSITY OF CONNECTICUT, STORRS, CT

### CT DEEP Permits IW-2003-112 and WQC-200302988

**June 2018**

**Submitted to:**
CT Department of Energy & Environmental Protection

**Submitted by:**
University of Connecticut

**Prepared by:**
Mason & Associates, Inc.
771 Plainfield Pike
North Scituate, Rhode Island 02857

# WETLAND MITIGATION MONITORING REPORT 10 - 2017

## CONTENTS

# WETLAND MITIGATION MONITORING REPORT 10 - 2017

## 1.0 Introduction

This report presents findings from the tenth and final year of wetland mitigation monitoring for the Landfill Capping and Remediation Project at the University of Connecticut in Storrs, Connecticut (Figures 1 and 2). This report has been prepared and submitted in accordance with Connecticut Department of Energy and Environmental Protection (CT DEEP) Permits IW-2003-112 and WQC-200302988 and the Wetland Mitigation Plan, University of Connecticut Landfill, Storrs, CT, Project #900748, dated June 2004 w/ addenda November 2004. Wetland monitoring for the U.S. Army Corps of Engineers (USACOE) permit was completed in 2013; this report therefore presents only the monitoring data required by CT DEEP for the last five years of the post-construction monitoring program, namely photographic documentation, evaluation of mitigation success in terms of vegetation and hydrology, and wildlife observations. This report concludes with a summary of overall mitigation program success and recommendations for future maintenance activities.

## 2.0 Site Photographs

Permanent photographic stations (photo stations) are established for each wetland mitigation site (Figure 3). Photographs were taken at these stations during spring, summer, and fall monitoring visits, using similar camera orientations to facilitate comparison. Captioned photographs of each mitigation area are included in Appendix A. Several photo stations have been slightly relocated (< 20-feet) from their original location because woody growth obscured the view. In addition to photos taken at the set photo stations, Appendix A also includes aerial photographs which provide additional documentation of mitigation site habitat development and seasonal variation.

## 3.0 Mitigation Success

A review of the health and survival of plantings and the hydrologic condition of the site during 2017 indicates that wetland mitigation associated with the landfill closure meets the project goals identified in the permits and mitigation plan. A field delineation of mitigation wetlands was conducted during 2017 using the federal delineation method to determine total gains and losses of wetlands resulting from the landfill remediation and wetland mitigation (Appendix B). 2017 monitoring indicates:

- No net loss of wetland area, i.e. the area of wetlands restored and created is greater than the area of wetlands lost due to direct and indirect impacts. Overall, the project resulted in the restoration of 3.24 acres of wetland, creation of 2.17 acres of wetland, and loss of 2.01 acres of wetland (Appendix B).
- Wetland restoration and creation sites demonstrate good functional value overall, including a variety of appropriate wildlife habitats.
- Plant and animal species observations continue to indicate rich species diversity, similar to nearby, undisturbed wetlands.
- Natural vegetation succession from herbaceous to woody growth continues as expected.
- Natural "basin filling" has led to expansion of emergent wetland plant species in some pools within wetland mitigation sites.
- Invasive plant species control efforts have been successful with the exception of Japanese stiltgrass (*Microstegium vimineum*).
- Major *Phragmites* control efforts in Wetland C have been successful in restoring native wetland vegetation over large areas. Aerial photography and analysis of vegetation along transects through *Phragmites* control areas have helped in planning these efforts and measuring their success.
- Educational and recreational use of mitigation wetlands within the Hillside Environmental Education Park (HEEP) increased in 2017. Trail work included brush clearing, establishing new trails, and trail mapping for the expanded HEEP area.

## 3.1 Plantings

Planting success was evaluated by performing a comprehensive reconnaissance of each mitigation area to observe plant species diversity, health, survival, and abundance. Inspections were performed in the winter, spring, summer and fall of 2017 to help identify less common plants, and those which are difficult to locate and/or identify at certain times of the year. Inspection during different seasons also improves the assessment of species abundance and health. Generally, woody plants are more likely to suffer damage from deer and rodents in the winter and early spring while insect damage is a more common problem in the summer and fall. Thirty-three representative 9-foot by 12-foot vegetation data plots originally evaluated in 2008 – 2010 were re-evaluated in 2017 for comparison. Restored and created wetlands continue to demonstrate plant species diversity and abundance appropriate to mitigation plan goals for each site (Table 1).

**Plant Species Diversity and Abundance**

Over 300 plant species were identified in the wetland mitigation sites and nearby areas during 2017 (Table 1, p. 10). For comparison, over 430 different plant species have been observed in the overall HEEP area over the past 15 years. A total of 161 plant species were observed in restored and created wetlands during 2017. The larger sites exhibited the greatest diversity;

Restoration Areas C West with 102 species; Wetland Creation Area C3 with 93 species; and Wetland Restoration Area C North with 60 species. No sites exhibited a significant change in plant species diversity compared to 2016. Over 60 species seen in previous years were not documented in 2017. Some of those unseen species may no longer occur in the project area, but most are likely to still occur but remained undocumented in 2017.

Plant abundance shown in Table 1 was estimated using percent aerial coverage in the following abundance classes: (A) Abundant (>= 75% cover); C - Common (25% - 74% cover); O - Occasional (5% - 24% cover); U - Uncommon (<5% cover). Most plant species observed in the Wetland Creation and Restoration sites cover less than 5% of the site in which they are found (Uncommon class). During 2017, no one plant was found to be in the Abundant class within a specific mitigation site. Only three sites had plant species in the Common class: Restoration Area C North showed both alder and tussock sedge as covering 25% or more of the site; Restoration Area C South exhibited alder in excess of 25% cover; Wetland Restoration Area F and Wetland Creation Area F1 exhibited late goldenrod cover over 25% or more of the area. Note that alder occurs in both the shrub and tree strata and will therefore overlap herbaceous strata. Clearing of the electric power transmission right-of-way in Restoration Areas C South and C North was done in the fall of 2017 after abundance estimate were made; it is likely that the overall cover of alder in both areas was reduced below the 25% cover threshold for the Common cover class.

The following plants were found in at least one mitigation area in the Occasional (5% - 24%) cover class:

| | |
|---|---|
| red maple | *Acer rubrum* |
| redtop | *Agrostis gigantea* |
| alder | *Alnus incana* |
| common wormwood | *Artemisia vulgaris** |
| grey birch | *Betula populifolia* |
| false nettle | *Boehmeria cylindrica* |
| lurid sedge | *Carex lurida* |
| tussock sedge | *Carex stricta* |
| deertongue | *Dichanthelium clandestinum* |
| horsetail | *Equisetum* sp. |
| flat-top goldenrod | *Euthamia graminifolia* |
| marsh bedstraw | *Galium palustre* |
| mannagrass | *Glyceria striata* |
| touch-me-not, spotted | *Impatiens capensis* |
| soft rush | *Juncus effusis* |
| water purslane | *Ludwigia palustris* |
| Japanese stiltgrass | *Microstegium vimineum** |
| sensitive fern | *Onoclea sensibilis* |
| cinnamon fern | *Osmundastrum cinnamomeum* |

| | |
|---|---|
| panic grass | *Panicum virgatum* |
| halberd-leaf tearthumb | *Persicaria arifolia* |
| swamp smartweed | *Persicaria hydropiperoides* |
| arrow-leaf tearthumb | *Persicaria sagittata* |
| northern dewberry | *Rubus flagellaris* |
| woolgrass | *Scirpus cyperinus* |
| woodland bulrush | *Scirpus expansus* |
| goldenrods | *Solidago* sp. |
| steeplebush | *Spirea tomentosa* |
| wrinkled goldenrod | *Solidago rugosa* |
| coltsfoot | *Tussilago farfara** |
| broad-leaf cattail | *Typha latifolia* |
| blue vervain | *Verbena hasata* |

* invasive species

Most of these plants are relatively widespread, with the exception of coltsfoot that remains limited to the upland edge of Wetland Creation Area C1 where a pre-existing population persists. This population of coltsfoot had spread in previous years but has been significantly reduced as a result of herbicide treatment.

The reduced frequency and level of effort associated with CT DEEP required monitoring in the period 2014 - 2017 resulted in the identification of fewer species overall than in the period 2008 - 2013. Plant species diversity has also decreased over time as wetlands develop more shrub and forest habitat; some species may no longer occur in a particular area because they are shade-intolerant and cannot thrive below the developing woody canopy (particularly with abundant deer present). Despite the overall trend of reduced plant diversity as the wetlands develop, several plant species were identified for the first time during 2017 including the prickly bog sedge (*Carex atlantica*) in Wetland Creation Area C3, and prickly pear cactus (*Opunta humifusa*) and Atlantic white cedar (*Chamaecyparis thyoides*) in the HEEP near Hunting Lodge Road.

Trees and shrubs in the mitigation areas continued to expand in areal cover and height (see Appendix A photographs). During 2017 some tree saplings grew taller than the 20-foot threshold required to be considered “forested” rather than “scrub-shrub” for the purpose of wetland classification. Deer, small mammals, and insects all continue to feed on woody plants, limiting the success of woody plant seedlings. Gypsy moth caterpillar infestation led to some tree defoliation but the surrounding forests were spared major damage seen elsewhere in northeast Connecticut. Nonetheless, new woody plants continue to survive and expand. Most remaining tubes and fences protecting woody plantings were removed and/or repurposed in 2017 because the trees had achieved sufficient height (~8-feet) that potential mortality due to mammal herbivory was considered slight. Occasionally, smaller trees in the 1-inch to 3-inch

diameter size class (+/-) suffered bark damage to deer rub. Unusually dry conditions through the summer of 2017 and in recent years did not appear to have a significant effect on woody growth (several trees appeared to succumb to drought in Wetland Restoration Area C West, and Wetland Creation Area A1). Brush cutting along the power line easement in Wetland Restoration Areas C North and C South was done in the fall of 2017; little ground disturbance was observed and brush piles were left along the right-of-way such that no adverse impacts to the wetland restoration occurred.

**Invasive Plant Species Control**

Invasive plant species control was performed on an ongoing basis (i.e. weeding by hand during regular inspections) and during focused efforts in the spring and fall. As specified in the Invasive Species Control Plan (June 2004), manual, mechanical, and chemical methods were used to control the key species of concern during 2017: common reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), autumn olive (*Elaeagnus umbellata*), glossy buckthorn (*Frangula alnus* [*Rhamnus frangula*]), and multiflora rose (*Rosa multiflora*). Purple loosestrife continues to be present, but it occurs at very low levels due to predation by the introduced biological control *Galerucella* sp. (loosestrife beetle). Additional invasive species regularly included in control efforts are the vine Asiatic bittersweet (*Celastrus orbicultatus*), the shrub Morrow's honeysuckle (*Lonicera morowii*), and the herbaceous plants Japanese stiltgrass and coltsfoot. The potential expansion of true forget-me-not (*Myosotis scorpioides*) in Wetland restoration C North continues to be a concern. During 2017 the native plant small forget-me-not (*Myosotis laxa*) was identified; it will be important to differentiate these two similar looking species before initiating any control efforts for *M. scorpioides.*

Spot treatments of reed canary grass, common reed, coltsfoot and Japanese stiltgrass with glyphosate herbicide were conducted on several dates from June through October 2017 using backpack spray equipment. All mitigation sites and some areas of adjacent upland were surveyed and herbicide applied to invasive plants encountered. Isolated patches of common reed that were intermixed with desirable native species were treated by wiping freshly cut stems with concentrated glyphosate (C North, C West, C3).

Triclopyr or glyphosate herbicide was applied as a cut-stump treatment to autumn olive, glossy buckthorn, Morrow's honeysuckle, multiflora rose and Asiatic bittersweet in all wetland mitigation areas. Focused efforts to suppress these woody species in areas outside the landfill remediation construction area but near wetland mitigation sites were made along trails at the edge of Wetland Creation Area C3, in the disturbed woodlands immediately east of C3 within the HEEP, and the area immediately to the south of Wetland Restoration Area C South.

*Microstegium vimineum*

The invasive Japanese stiltgrass continues to thrive where established, primarily in Wetland Creation Area C3 and Wetland Restoration Areas C South and C North. However, the stiltgrass occurs in wet meadows with other wetland herbaceous plants, and the populations did not appear to expand significantly in 2017. A wildlife camera in Wetland Restoration Area C south documented deer and rabbit foraging on the stiltgrass; raccoon were also observed frequently traversing the stiltgrass at that site. Deer use the denser stands of stiltgrass as bedding areas in C South and C3. The occurrence of stiltgrass stands along well-traveled game trails indicates mammals are helping to distribute the seeds of this invasive grass. Field observations suggest the stiltgrass does not compete well with robust wetland plants such as woodland bulrush or tussock sedge especially where flooding occurs during the growing season. Although it is a shade tolerant species the stiltgrass has not been seen to expand significantly into areas of complete canopy cover.

In some places the stiltgrass forms a near 100% stand. In most places this grass occurs where native species provide close to 100% cover during the first half of the growing season; in August and September the stiltgrass may overtop the native herbaceous species and become dominant in aerial cover. Thirty-three (33) vegetation plots were assessed in 2017, in part to help document the spread of this invasive species. Stiltgrass was present in about half (16) of these plots; 14 plots showed stiltgrass at 20% cover or less while one plot showed 30% cover and one plot showed 65% cover. Stiltgrass should continue to be monitored to ensure it does not become dominant and displace native plant communities.

*Phragmites australis*

Populations of common reed in Wetland C, north of Wetland Restoration Area C West and northwest of Wetland Restoration Area C North were sprayed with herbicide on October 19, 2017 with a powered sprayer deployed from a tracked vehicle. Inspection of the areas similarly treated in 2014 - 2016 indicated good suppression of *Phragmites* with a resurgence of relatively diverse native plant growth (Figure 4 - 6). Two vegetation transects established in Wetland C were studied to evaluate the effectiveness of herbicide applications. Transect A crosses the southern portion of Wetland C that was treated in 2015 and 2016; Transect B crosses the northern portion of Wetland C in the area treated in 2016 and 2017. Along each transect, 9-foot x 12-foot vegetation plots (quadrats) were established on alternating sides of the transect line. Areal cover (%) of each plant species was estimated in 16 quadrats in 2016 (Transect A) and 41 quadrats in 2017 (25 along Transect A and 16 along Transect B). *Phragmites* had been present in 15 of the 25 Transect A quadrats prior to 2016 herbicide application; 2017 monitoring showed *Phragmites* had been eliminated from 12 of the 15 quadrats, and significantly reduced in the remaining 3. Moreover, native plant regrowth covered over 70% of the quadrats assessed, with over 30 native species represented. The most common native species observed in the 25 plots assessed along Transect A in 2017 were:

| Common Name | *Scientific Name* | No. Plots (of 25) |
|---|---|---|
| Cattail | *Typha spp.* | 23 |
| tussock sedge | *Carex stricta* | 15 |
| marsh fern | *Thelypteris palustris* | 12 |
| speckled alder | *Alnus incana* | 10 |
| false nettle | *Boehmeria cylindrica* | 9 |
| arrowleaf tearthumb | *Persicaria sagittata* | 9 |
| sensitive fern | *Onoclea sensibilis* | 8 |
| spotted touch-me-not | *Impatiens capensis* | 7 |
| American burnweed | *Erechtites hieraciifolius* | 6 |

In addition to alder, woody native plants in the assessed quadrats were highbush blueberry, winterberry, maleberry, huckleberry and red maple.

Transect B crosses the *Phragmites* stand that was first treated in October 2016, along the northern shore of Wetland C. Sixteen quadrats were assessed along Transect B in 2017. *Phragmites* had been present in 14 of these plots, and remained in 9 plots, although at a much lower abundance. Overall, the 2017 evaluation of Transect B quadrats showed an 87% reduction in the areal cover of *Phragmites*. Sixteen of the 19 species identified along Transect B are non-invasive, the most common being tussock sedge, cattail, alder, and swamp rose (*Rosa palustris*). In addition to the remaining *Phragmites*, the invasive plants multiflora rose and bittersweet were also present in small amounts.

The vegetation data collected along Transects A and B indicates herbicide treatment of *Phragmites* has been effective in suppressing this invasive plant. Although coincidental damage to other plants such as cattail and tussock sedge has been observed, the resurgence of these and other native wetland plants has established nearly complete vegetative cover within two years of treatment. Small patches of *Phragmites* remain in some places, requiring follow-up treatment. The Transect data were collected prior to the October 2017 herbicide spraying and it is expected further reduction in the Wetland C *Phragmites* populations will be observed during the 2018 growing season.

Extensive ground reconnaissance for vehicle access done in previous years facilitated treatment of northern populations of *Phragmites* in Wetland C during 2017. Due to past mining activities that created deep channels in Wetland C, vehicle access to certain areas is severely limited. However, even the remote populations of *Phragmites* were treated for the first time in 2017. Much of the work done from the tracked vehicle involved spot application of herbicide to small, residual patches of *Phragmites* present in prior treatment areas. A backpack sprayer was also used to treat isolated patches of *Phragmites* along the wetland edge near Celeron Square and Holinko Estates.

Revisiting these treatment areas will continue to be necessary in future years to suppress *Phragmites* regrowth; this approach has proven to be successful and cost effective. Over time, the level of effort for follow-on treatment (spot applications of herbicide) has been shown to decrease as native plants become better established.

## 3.2 Hydrology

Hydrologic measurements were collected at permanent monitoring stations in each of the wetland mitigation areas and several reference wetland sites (Figure 7). Water levels were measured quarterly during the growing season, to a precision of +/- 0.01 foot, at permanent staff gauges and monitoring wells. Staff gauge readings were taken by sight with the assistance of photographs. Monitoring well readings were taken using depth probes / level sensors. The maximum water depth was recorded for created Vernal Pool B and three reference vernal pools. Water level measurements help to confirm that target wetland hydrology has been achieved in all the wetland restoration and creation areas (Tables 2 and 3). The beaver dam at the outlet of Wetland C was abandoned by beaver prior to the spring of 2015; it has remained intact but leaky, resulting in lower water levels than during the time the dam was actively maintained.

2017 was the fourth year in a row with below average precipitation at Windham Airport; 37.94 inches of precipitation was recorded in 2017 compared to 48.4 inches on average (average = normal monthly precipitation during period 1981 – 2010). However, the UConn NRE Water Resources Field Station at Storrs reported a 2017 precipitation total of 41.13 inches, higher than recorded at Windham Airport and higher than the reported average for the Field Station at Storrs (39.63 inches). Comparison of monthly averages at the two weather stations (Figure 8) shows that Windham has monthly total precipitation consistently higher than Storrs, except for June and August when Storrs was higher. Both stations showed below average monthly precipitation in February, September, November and December, while October precipitation was significantly higher than average.

The difference in 2017 precipitation between the Windham Airport and UConn NRE Water Resources Field Station at Storrs can be explained by their different locations, the UConn station is 5 to 6 miles north of the airport and 279 feet higher in elevation (525 feet vs. 246 feet). Monthly totals at the two stations were relatively close in 2017 except for January and August when the Storrs station monthly total was about 2-inches higher than at the airport. The discrepancy between the two stations is more apparent in the historic average precipitation data. The National Weather Service 2017 annual precipitation for Hartford (Bradley Airport) was reported as 45.58 inches, compared to a normal annual precipitation of 45.85 inches (average for the 1980 – 2010 period). The National Weather Service 2017 annual precipitation for Providence (T.F. Green Airport) was reported as 49.00 inches, compared to a normal annual precipitation of 47.18 inches (average for the 1980 – 2010 period). It appears the 2017

precipitation data for Windham Airport are not representative of conditions at Storrs, Hartford or Providence where data indicate annual precipitation was somewhat above normal.

Measurements of both surface water and groundwater levels at wetland mitigation sites in 2017 showed normal to above average levels for the most part (Tables 2 and 3). Fall water levels were generally higher than average due to above average precipitation in October. Spring water levels were generally similar or slightly higher than in 2016, indicating some recovery in water levels after several years of below average precipitation. Wetland A and A1 were exceptions, showing somewhat lower water levels than in 2016. During 2017 all wetland mitigation sites demonstrated surface water and/or groundwater hydrology that meets target water regimes for the restored and constructed wetlands.

Restored and created streams demonstrated more typical flow regimes in 2017, compared to 2016. Perennial flow was observed in the flow from the central pool in Wetland Restoration Area C3, through Wetland Restoration Area C North, and through the outlet pool discharging flow from Wetland C. Streams in Wetland Restoration Areas A, C South, and C West all exhibited prolonged flow in the spring with intermittent flows in the summer and fall. Spring and fall surveys of pools throughout the mitigation areas and some nearby vernal pools indicate that fewer pools were dry in the fall of 2017 than the fall of 2016 (Figure 9). Only two pools were observed to be dry in C South during 2017, compared to 13 pools that were dry during the fall of 2016. Similar observations can be made comparing 2017 and 2016 data for pools at the southern portion of Wetland Restoration Areas C North and C West.

These findings continue to indicate a variety of wetland water regimes and hydroperiods are present that support planned wetland plant communities, aquatic and terrestrial wildlife habitats, and other water-related wetland functions as specified in the Wetland Mitigation Plan for the landfill remediation. Grades and associated drainage patterns have stabilized over the ten-year monitoring period, although natural basin filling and stream meandering is expected to continue.

## 4.0 Wildlife

Wildlife observations recorded during 2017 are listed by mitigation area in Table 4. This table also lists species recorded since construction began in 2006. Observations made by M&A were supplemented with observations made by the UConn ornithology class. Listed species were identified by sight, photograph, sound, track, scat, egg, and skull morphology. This wildlife inventory is based on data collected during field inspections, pool surveys, and by wildlife cameras. As such, it should not be considered a comprehensive list. Species observed in one mitigation area are likely to occur elsewhere on the project site, even if sightings in other areas were not documented. Additionally, nocturnal animals are under-represented since no site

inspections occurred at night. Motion triggered wildlife cameras included infrared illumination to assist in the identification of nocturnal wildlife.

Wildlife use of mitigation sites demonstrates these areas continue to provide cover, forage, breeding sites, and travel corridors. Notable observations include bobcat in Wetland Creation Area C3, and newly identified macroinvertebrates in Wetland Restoration Area C South (wandering glider dragonfly) and created Vernal Pool B (sweetheart underwing moth).

Generally, the palustrine emergent wetlands (marshes and wet meadows) continued to demonstrate excellent pollinator habitat with abundant cover of goldenrods and smartweeds in particular. Wet meadows, shallow marsh and the small upland islands within these wetlands continued to provide habitat for large populations of small mammals such as mice. Coarse woody debris continues to provide microhabitat important for small mammals, amphibians, reptiles, and some bird species. Restoration and creation areas demonstrate structural diversity and a suitable interspersion of habitat types and special habitat features. Woody edges of the mitigation construction areas contribute to habitat diversity and abundance.

Spring pool surveys showed an increase in the number of pools used for amphibian breeding in Wetland Restoration Area C South in 2017 compared to 2016 (Figure 9, Table 5). Amphibian breeding was not observed in the pools in Wetland Creation Area C3 as in past years. Created Vernal Pool B continued to support wood frog and spotted salamander reproduction, and twelve (12) created pools in the other wetland mitigation sites supported amphibian reproduction (compared to 14 pools in 2016 and 9 pools in 2015). Observation of grey treefrog metamorphs was particularly frequent in the late summer of 2017 compared to past years.

The 165-acre HEEP preservation area, in which most of the mitigation areas are included, contains both upland and wetland habitats. The HEEP contains excellent wildlife habitat and contributes to the long-term habitat value of the project mitigation areas. This open space preservation area has served as an outdoor classroom and passive recreation area; the HEEP preserve has been expanded northward as part of the Discovery Drive road project. Student members of EcoHuskies and EcoHouse helped to maintain trails within the HEEP during the fall of 2017. Students working with UConn's OEP helped to mark new trails in the HEEP and developed interpretive signage and trail maps for the expanded HEEP area. UConn classes in wetlands, hydrology, ornithology and environmental engineering continued to use the HEEP wetlands for education and research.

## 5.0 Summary and Recommendations

Wetland monitoring in 2017 emphasized invasive species monitoring and control, with continued monitoring of vegetation, hydrology and wildlife. Site wetlands were visited on more

than 25 separate occasions in 2017 for various monitoring and/or invasive species control activities. The following conclusions are based on observations made in 2017:

- A final wetland delineation in 2017 documented wetland boundaries and mitigation site areas. The wetland mitigation has been successful in achieving Wetland Mitigation Plan goals and objectives, including a greater than 1:1 ratio of wetland restoration and creation to wetland loss (both direct and indirect); i.e. wetland areas gained exceed wetland areas lost. Despite several recent years of below-normal precipitation, no planned mitigation sites decreased in size based on observations of wetland vegetation, soil morphology, and hydrology.

- The functional value of wetlands restored and created exceeds the value of pre-construction wetlands. This is due to the removal of waste material / contaminants and the addition of structural and biological diversity to the mitigation wetlands.

- The functional value of mitigation wetlands was demonstrated, in part, by continued observation of diverse plant and animal populations. Species diversity is somewhat lower than in previous years; this is due to the reduced frequency of monitoring and continued expansion of trees and shrubs which displace certain herbaceous species. Evaluation of 33 vegetation plots (9-foot x 12-foot quadrats) documented the successful establishment of diverse native plant species at all planned mitigation sites.

- Invasive species control activities have been effective in protecting the mitigation wetlands and enhancing nearby areas of the HEEP. Major *Phragmites* control efforts in Wetland C appear successful based on the regrowth of native species in the control areas. The effectiveness of *Phragmites* control efforts in Wetland C was assessed with detailed evaluation of 41, 9-foot x 12-foot vegetation plots along two transects. Additional areas of *Phragmites* were treated with glyphosate such that all major populations of this weed have been treated at least once in Wetland C. The extent of invasive species was reduced in 2017 as a result of manual and chemical controls, with the exception of Japanese stiltgrass which persists despite control efforts in previous years. Although the range of the stiltgrass expanded somewhat in 2017, it is not abundant except in very small localities.

- Precipitation in 2017 appeared closer to normal than in recent years despite unusually low rainfall at the Windham Airport reference site. Water levels measured in wells and surface waters were closer to average conditions compared to the previous three years.

- Amphibian reproduction in Wetland restoration Area C South returned to levels seen prior to 2016 as did amphibian activity overall. Thirteen created pools and eight pre-existing seasonal pools exhibited amphibian breeding activity in 2017.

- Educational use of the HEEP was demonstrated by continued use as an outdoor classroom by several UConn classes as well as individual studies by students of wetland science.

The following actions are recommended for future mitigation area maintenance:

1. Conduct monitoring inspections of mitigation sites seasonally to verify the functional values of created and restored wetlands are maintained.

2. Use wildlife cameras and water level recording devices at select locations to supplement site inspection data.

3. Take low altitude aerial photographs periodically to document vegetation, wildlife habitat, and overall mitigation success.

4. Perform invasive plant species monitoring and control. Conduct follow-up *Phragmites* control in Wetland C within the HEEP. Evaluate the success of *Phragmites* control there by monitoring vegetation documentation plots / transects established in 2016 and 2017. Evaluate Japanese stiltgrass expansion and abundance. Incorporate these activities into an adaptive management program / stewardship program for the expanded HEEP. Coordinate such invasive species activities with similar efforts associated with the Discovery Drive wetland mitigation plan.

5. Repurpose or remove tree and shrub protection (fences and tree tubes)as appropriate.

6. Maintain established HEEP trails and views from observation platforms by trimming woody vegetation with hand tools.

7. Coordinate with other HEEP activities to update / replace trail maps, trail markers, and interpretive signage.

## REFERENCES


CT Department of Environmental Protection. May 10, 2005. Permit No. IW-2003-112, WQC-200302988, Inland Wetlands and Watercourses, Section 401 Water Quality Certification, Mansfield, Landfill Capping and Remediation.

Gleason, Henry A. and Arthur Cronquist, Ph.D. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada, second edition. The New York Botanical Garden, Bronx, NY.

Haines, Arthur. 2011. Flora Novae Angliae. New England Wild Flower Society. Yale University Press, New Haven, CT.

Holmgren, Noel H., et al. 1998. Illustrated Companion to Gleason and Cronquist's Manual; Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden, Bronx, NY.

Klemens, M.W. 1993. Amphibians and Reptiles of Connecticut and Adjacent Regions. State Geological and Natural History Survey Bulletin No. 112. Connecticut Department of Environmental Protection. Hartford, CT. 318 p.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X

Mason & Associates, Inc. 2008 - 2016. Wetland Mitigation Monitoring Reports 1 - 9, Landfill Closure Project #900748, University of Connecticut, Storrs, CT.

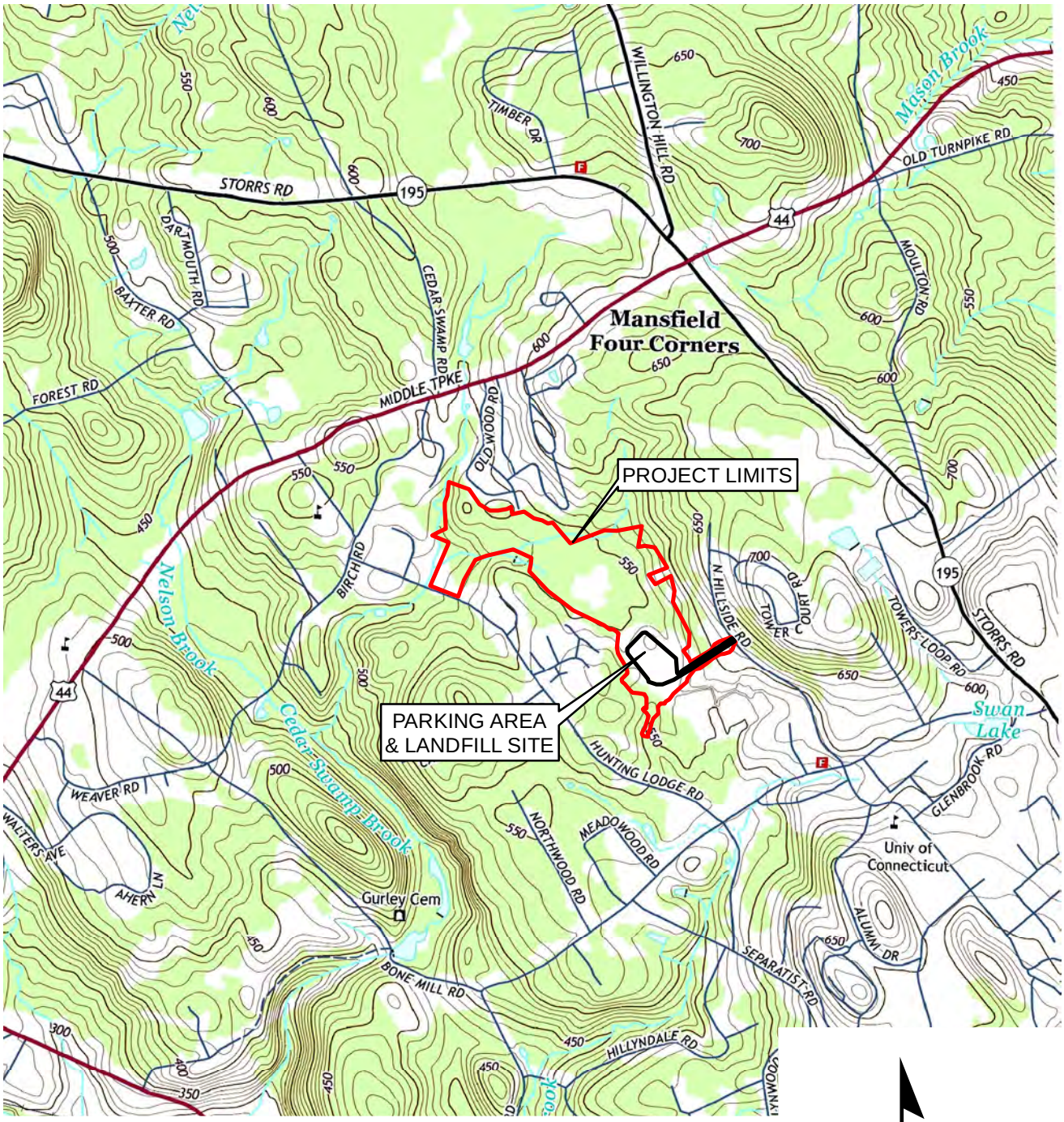
Mason & Associates, Inc. June, 2004. Wetland Mitigation Plan, University of Connecticut Landfill, Storrs, CT, Project #900748.

Nikula, Blair, Jennifer L. Loose, & Matthew R. Burne. 2003. A Field Guide to the Dragonflies and Damselflies of Massachusetts. Massachusetts Division of Fisheries & Wildlife Natural Heritage Endangered Species Program.

Peckarsky, Barbara L. Pierre R. Fraissinet, Marjory A. Penton, and Don J. Conklin, Jr. 1990. Freshwater Macroinvertebrates of Northeastern North America. Ithaca, NY.

U.S. Department of Agriculture Natural Resource Conservation Service. 2017 - 2018. The PLANTS Database (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

# FIGURES




Approximate Location of:

Parking Area & Closed Landfill Site

Project Limits

N

0 2,000 Feet

Approximate Scale

Source: 7.5 minute USGS Topographic Quadrangle - Coventry, CT 2015

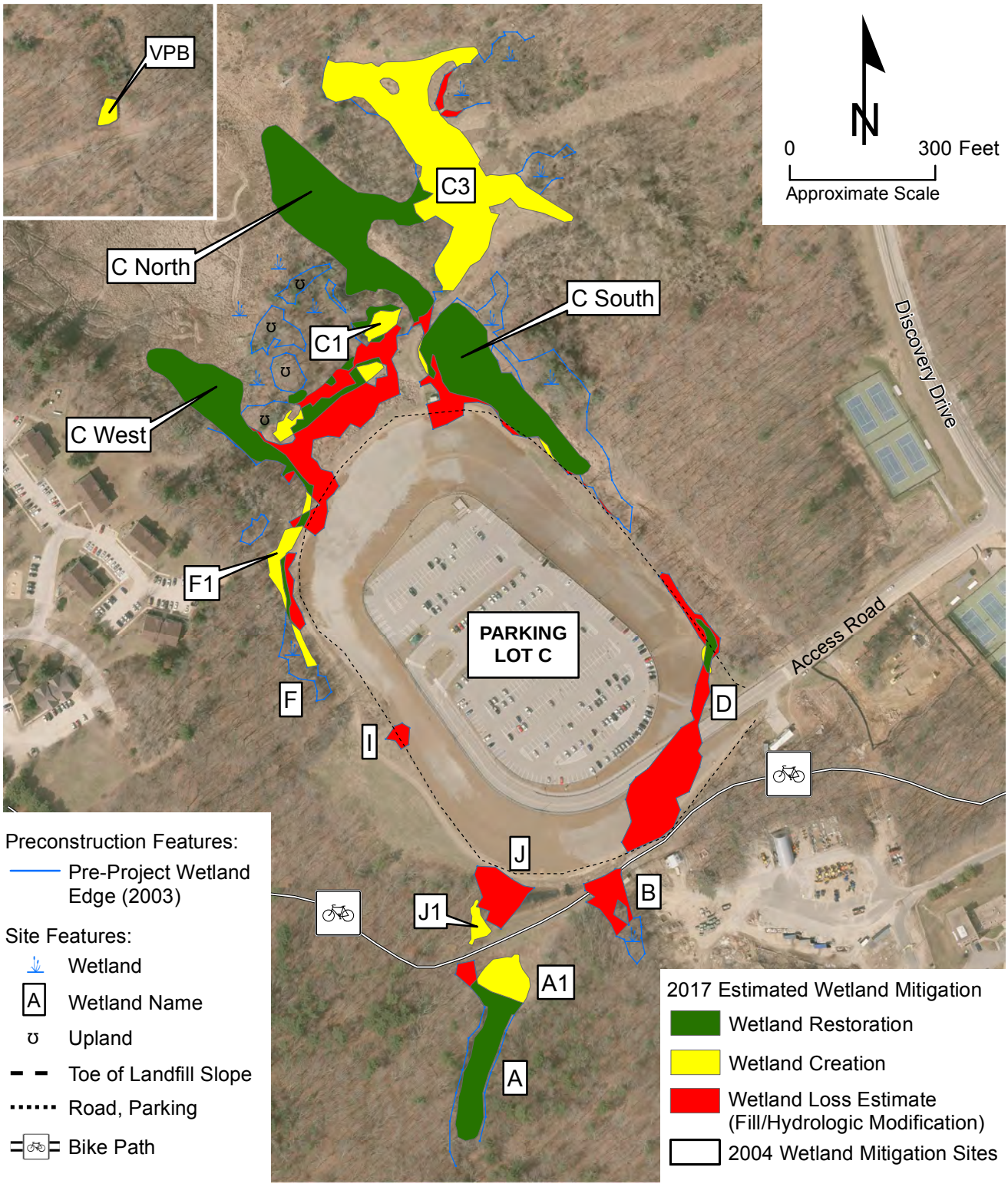
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

**PROJECT LOCATION**

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Project No. 140101

Figure 1



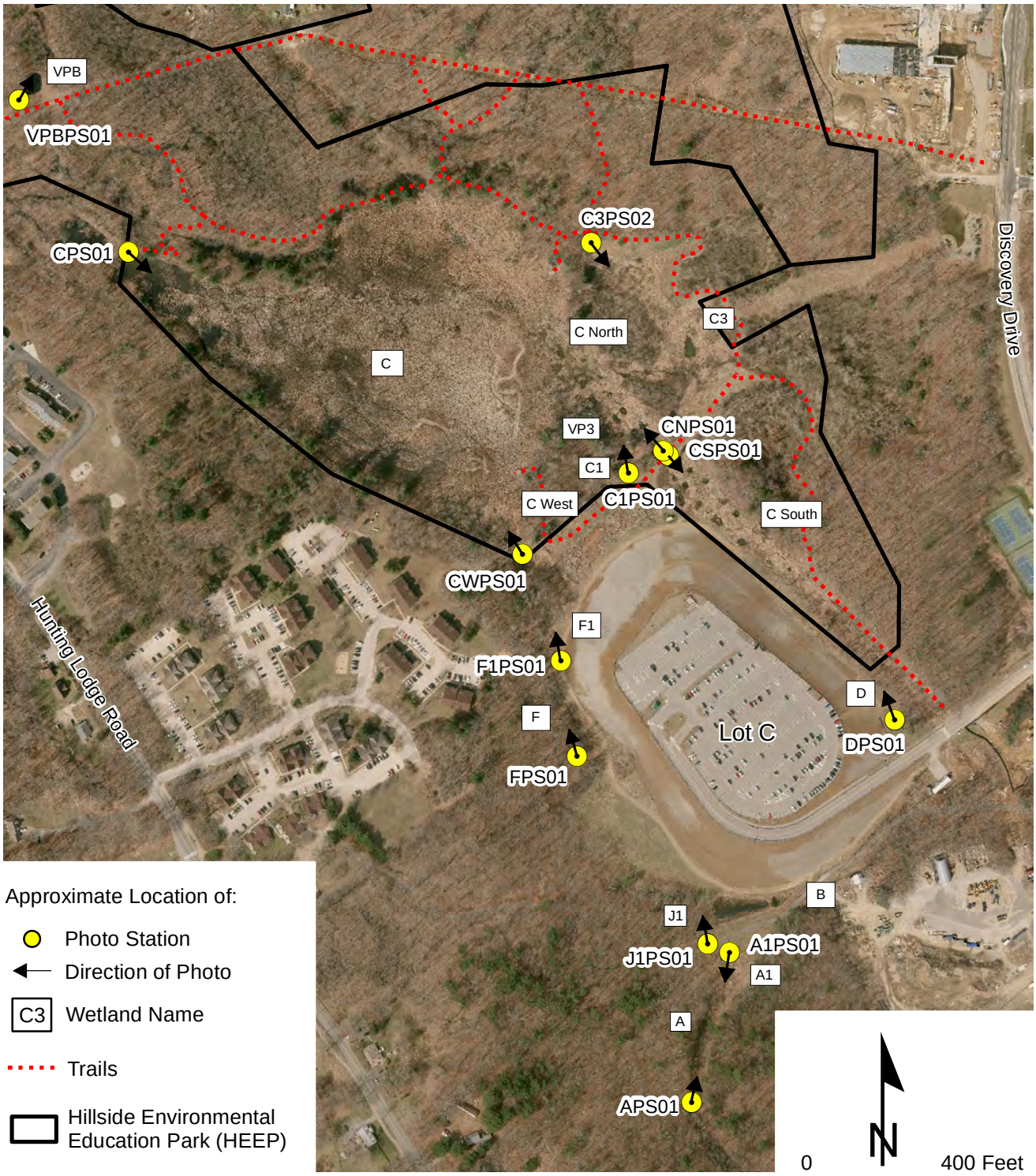

Source: 2016 Aerial Photograph - CTEco (CRCOG/ The Sanborn Map Company, Inc.)

Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# 2017 ESTIMATED WETLAND IMPACTS AND MITIGATION

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Project No. 140101 | Figure 2




Source: 2016 Aerial Photograph - CTEco (CRCOG/ The Sanborn Map Company, Inc.)

Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

**PHOTO STATIONS**

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Project No. 140101 | Figure 3

Regrowth of Native Plants in 2015 Phragmites Treatment Area,
Transect A Quadrat TA96-108W, View North, August 1, 2018

View Northeast of 2016 *Phragmites* Treatment Area,
North Edge of C West, Near Transect B, October 19, 2017

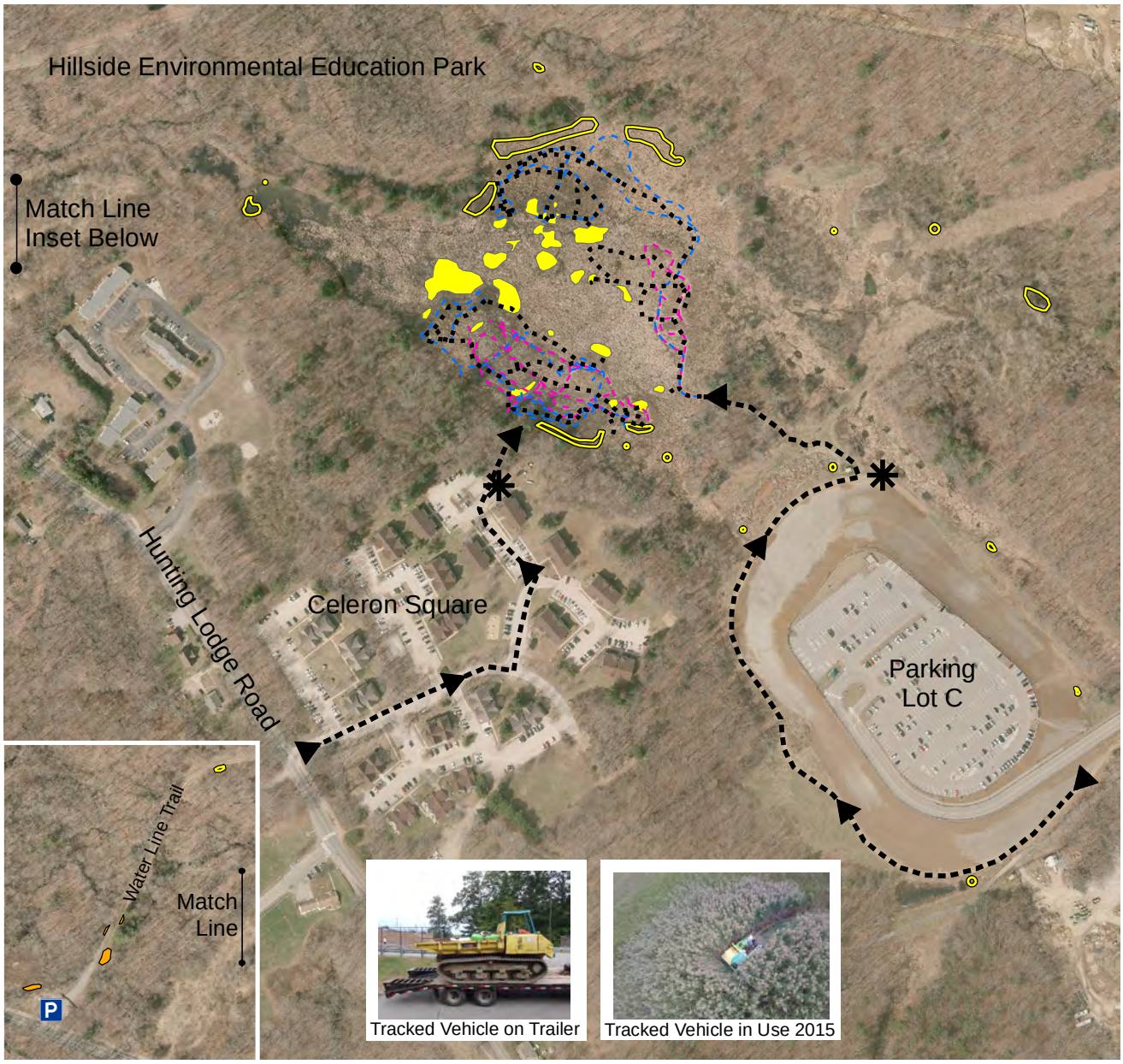
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

**NATIVE SPECIES REGROWTH IN PHRAGMITES TREATMENT AREAS**

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Project No. 140101

Figure 4




2017 Glyphosate Application:

- Backpack Sprayer / Cut & Drip
- Pump Sprayer on Pickup Truck
- Tracked Vehicle & Pump Sprayer

Tracked Vehicle Route:

- 10/19/2017
- 10/7/2016
- 9/22/2015

Tracked Vehichle: Access Route ✱ Trailer Parking

Source: 2016 Aerial Photograph - CTEco (CRCOG/ The Sanborn Map Company, Inc.)

N

0 400 Feet

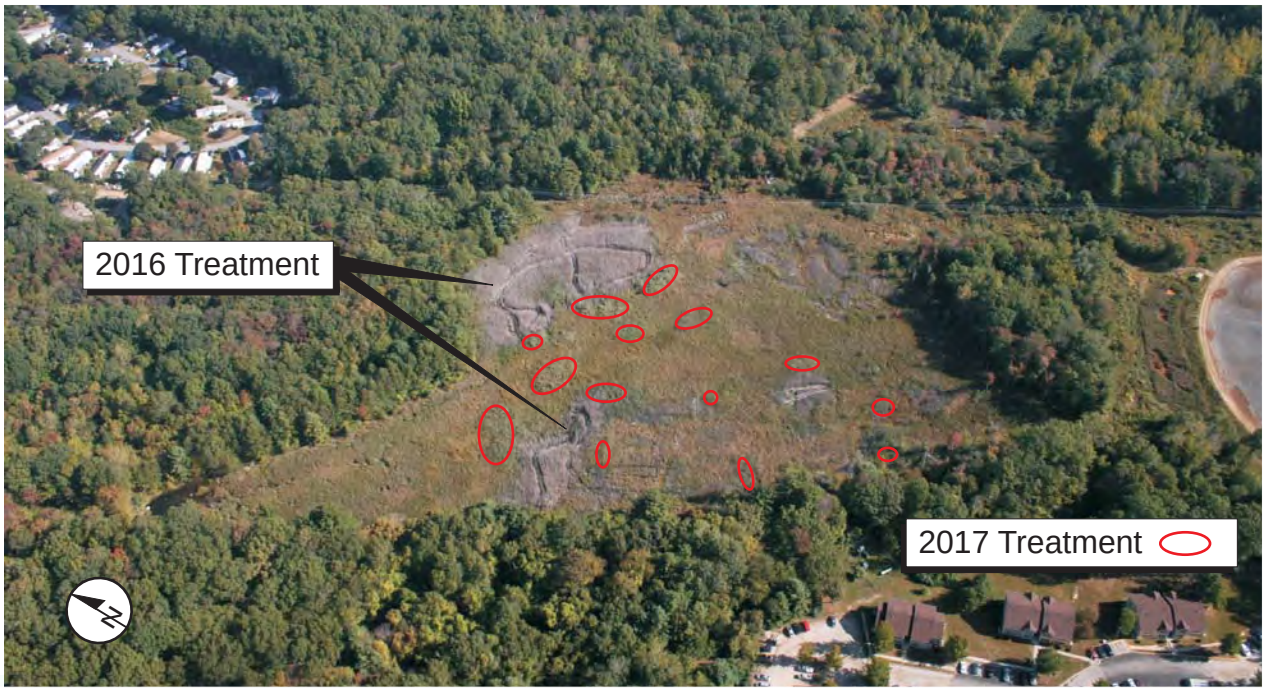
Approximate Scale

Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# PHRAGMITES TREATMENT 2017

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Project No. 140101 | Figure 5




October 3, 2017 Aerial View of Wetland C (Quarry Swamp)
Showing Major 2016 and 2017 Phragmites Treatment Areas


View West of October 19, 2017 *Phragmites* Treatment at
Hunting Lodge Road Parking Area, Hillside Environmental Education Park

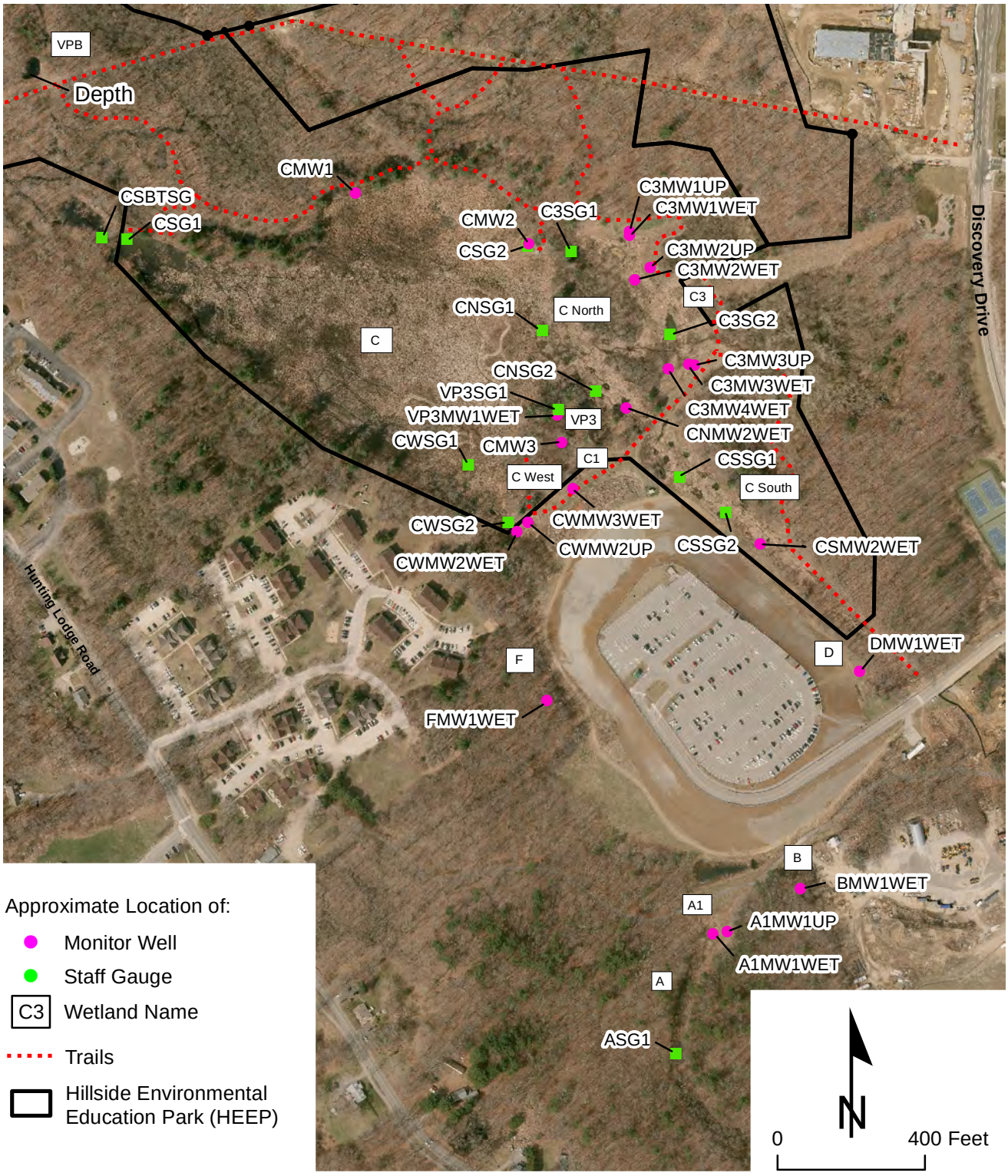
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

**2017 *PHRAGMITES***
**TREATMENT PHOTOGRAPHS**

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Project No. 140101

Figure 6




Source: 2016 Aerial Photograph - CTEco (CRCOG/ The Sanborn Map Company, Inc.)

Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# HYDROLOGIC MONITORING STATIONS

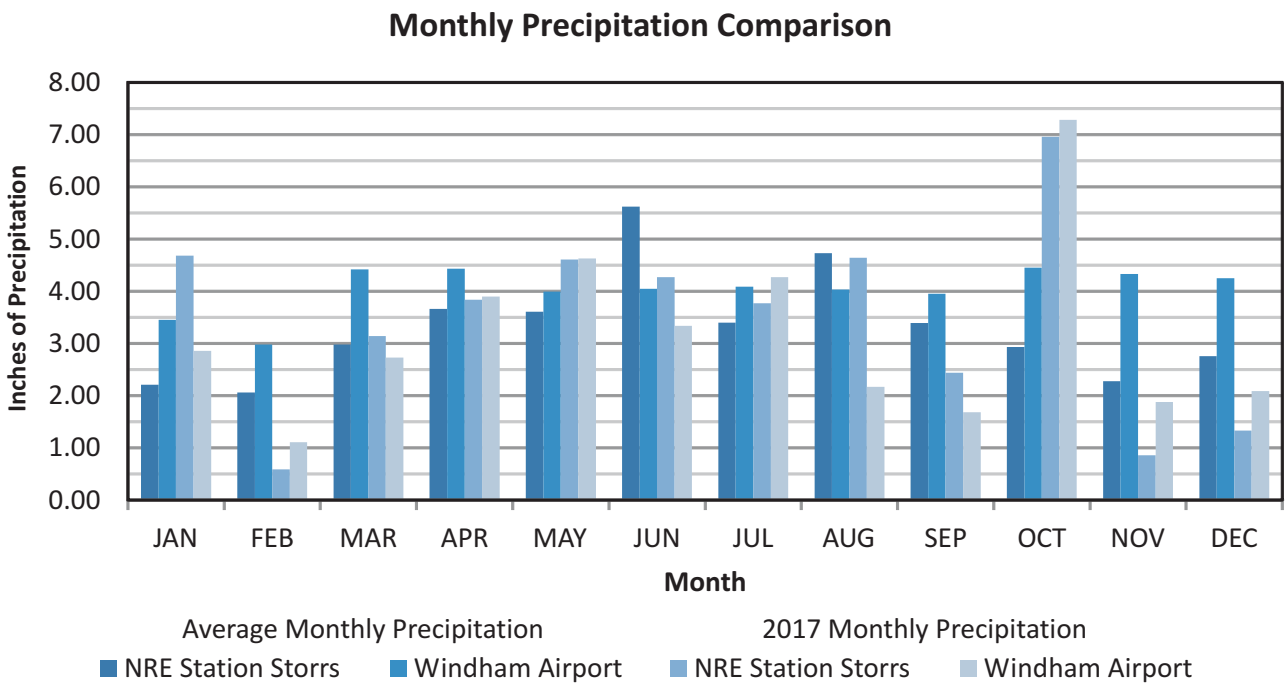

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857


Project No. 140101 | Figure 7

Inches of Precipitation per Month

| Month | Average Monthly Precipitation NRE Station Storrs | Average Monthly Precipitation Windham Airport | 2017 Monthly Precipitation NRE Station Storrs | 2017 Monthly Precipitation Windham Airport |
|---|---|---|---|---|
| JAN | 2.21 | 3.45 | 4.68 | 2.86 |
| FEB | 2.06 | 2.98 | 0.59 | 1.11 |
| MAR | 2.98 | 4.42 | 3.14 | 2.73 |
| APR | 3.66 | 4.43 | 3.84 | 3.90 |
| MAY | 3.61 | 3.99 | 4.61 | 4.63 |
| JUN | 5.62 | 4.05 | 4.27 | 3.34 |
| JUL | 3.40 | 4.09 | 3.77 | 4.27 |
| AUG | 4.73 | 4.03 | 4.64 | 2.17 |
| SEP | 3.39 | 3.95 | 2.44 | 1.68 |
| OCT | 2.93 | 4.45 | 6.96 | 7.28 |
| NOV | 2.28 | 4.33 | 0.86 | 1.88 |
| DEC | 2.76 | 4.25 | 1.33 | 2.09 |
| Total = | 39.63 | 48.42 | 41.13 | 37.94 |

Sources: NRE Water Resources Field Station, UConn, Storrs, CT Weather
Airport Monthly Normal 1981 - 2010 http://www.canr.uconn.edu/nrme/cscc/CTClimateCenterData.zip
Windham 2017 Monthly www.wunderground.com/history/airport/KIJD/2017



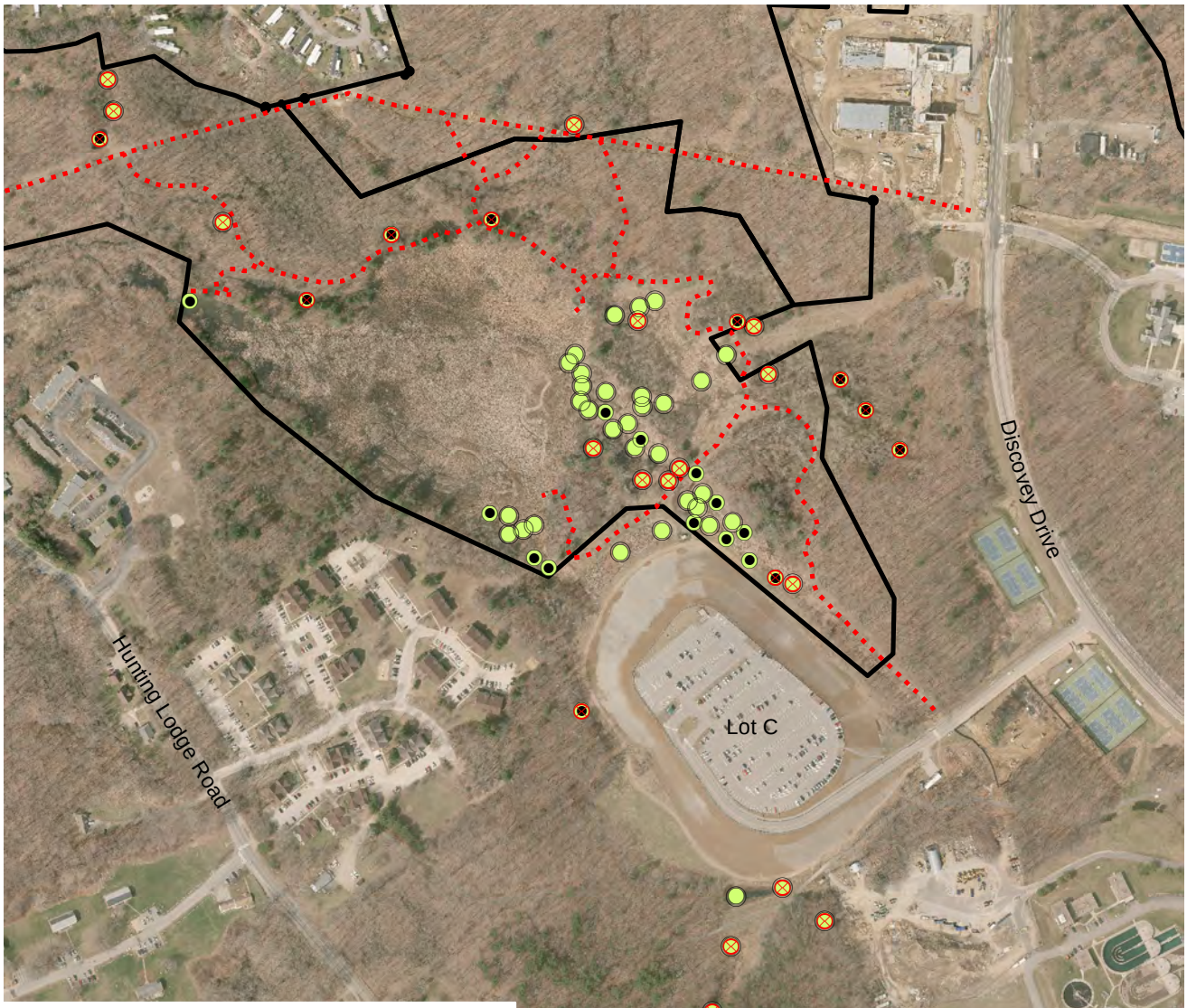

Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

**2017 MONTHLY PRECIPITATION**

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Project No. 140101

Figure 8




Approximate Location of:

- Pools Surveyed in April & May 2017
- Pools With Amphibian Breeding in 2017
- Pools Dry in October 2017
- C3 Wetland Name
- Trails
- Hillside Environmental Education Park (HEEP)

N

0 500 Feet

Approximate Scale

Source: 2016 Aerial Photograph - CTEco (CRCOG/ The Sanborn Map Company, Inc.)

Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# 2017 POOL SURVEYS

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Project No. 140101 | Figure 9

# TABLES

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| Scientific Name | Common Name | Wetland Indicator Status[2] | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | A1 | CN | CS | CW | C1 | C3 | F1/F | J1 | VPB | Other |
| *Acer negundo* | box elder | FAC | | | | | | | | | | | U |
| *Acer rubrum*[1] | red maple | FAC | O | U | U | U | U | U | U | O | | U | O |
| *Acer saccharinum* | silver maple | FACW | | | | | | | U | | | | |
| *Achillea millefolium* | common yarrow | FACU | | | U | U | U | | U | | | | U |
| *Agalinis purpurea* | false-foxglove, large purple | FACW | | | | | | | | | | O | |
| *Agrostis capillaris* | colonial bentgrass | FAC | | | | U | | | U | | | | U |
| *Agrostis gigantea* | redtop | FACW | | | | O | U | | | | | | U |
| *Agrostis* sp. | bent-grass | - | | | U | | | | | | | | |
| *Agrostis stolonifera* | creeping bent-grass | FACW | | | | U | U | | U | U | | | U |
| *Alisma subcordatum* | water plantain | OBL | U | U | U | O | | U | U | O | | | |
| *Alnus incana*[1] | speckled alder | FACW | | | C | C | U | O | O / C | | | | U |
| *Alopecurus aequalis* | foxtail, short-awned | OBL | | | | | | | | | | | |
| *Ambrosia artemisiifolia* | common ragweed, annual | FACU | | | U | U | U | | U | | | | U |
| *Amelanchier canadensis* | shadbush | FACW | | | | | | | | | | | U |
| *Anthoxanthum odoratum* | sweet vernal grass | FACU | | | | | | | | | | | U |
| *Apios americana* | ground nut | FACW | | | | | | | | | | | U |
| *Apocynum androsaemifolium* | dogbane | UPL | | | | | | | | | | | U |
| *Apocynum cannabinum* | Indian hemp | FAC | | | | | | | | | | | U |
| *Arabis glabra* | tower rockcress | - | | U | | | U | | U | | | | U |
| *Arisaema triphyllum* | Jack-in-the-pulpit | FAC | | | | | | | | | | | U |
| *Artemisia vulgaris* | common wormwood | UPL | | | | | U | | | | O | | U |
| *Asclepias incarnata* | swamp milkweed | OBL | | | | | U | | | | | | |
| *Asclepias* sp. | milkweed | OBL-UPL | | | U | | U | | | | | | U |
| *Barbarea vulgaris* | yellow rocket | FAC | | | U | U | U | | | | | | U |
| *Berberis thunbergii* | Japanese barberry | FACU | | | U | | U | | | | | | U |
| *Berteroa incana* | hoary alyssum | - | | | | | | | U | | | | |
| *Betula alleghaniensis*[1] | yellow birch | FAC | | | U | | | | | | | | U |
| *Betula nigra* | river birch | FACW | | | | | U | U / O | U | | | | |
| *Betula papyrifera* | paper birch | FACU | | | | | | | | U | | | U |
| *Betula populifolia*[1] | grey birch | FAC | | U | | U | U | U / O | U | U | | | U |
| *Bidens cernua* | nodding burr-marigold | OBL | | | | | | | | | | | U |
| *Bidens frondosa* | devil's beggar-ticks | FACW | | | U | | | | | | | | U |
| *Bidens sp.* | beggar-ticks | - | | | U | U | U | U | U | | | | |
| *Bidens tripartita*[1] | swamp beggar-ticks | FACW | | | | | | | | | | | U |
| *Boehmeria cylindrica* | false nettle, small spike | OBL | U | U | O | O | O | U | U | | | | U |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| Scientific Name | Common Name | Wetland Indicator Status[2] | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | A1 | CN | CS | CW | C1 | C3 | F1/F | J1 | VPB | Other |
| *Bromus erectus* | erect brome | - | | | | | U | | | | | | |
| *Bulbostylis capillaris* | dense-tuft hair grass | FACU | | | | | | | U | | | | |
| *Calamagrostis canadensis* | bluejoint | OBL | | | U | | ? | | | | | | U |
| *Calamagrostis coarctata* | arctic reedgrass | OBL | | | | | | | | | | | U |
| *Caltha palustris*[1] | marsh marigold | OBL | | | U | U | | U | U | | | | U |
| *Carex annectens* | yellow fruit sedge | FACW | | | | U | | | | | | | |
| *Carex atlantica* | prickly bog sedge | FACW | | | | | | | U | | | | |
| *Carex comosa* | bearded sedge | OBL | | | U | | | | | | | | U |
| *Carex crinita* | fringed sedge | OBL | U | | | U | | U | U | | | | U |
| *Carex diandra* | lesser panicled sedge | OBL | | | | | U | | | U | | | |
| *Carex echinata* | star sedge | OBL | | U | | | U | | U | | | | |
| *Carex intumescens* | greater bladder sedge | FACW | | | | | | | | | | | U |
| *Carex lupulina* | hop sedge | OBL | | | | U | | | | | | | |
| *Carex lurida* | shallow lurid sedge | OBL | U | U | U | O | U | | U | O | | | U |
| *Carex pensylvanica* | Pensylvania sedge | - | U | | | | | | | | | | U |
| *Carex scoparia* | broom sedge | FACW | U | | | U | | | U / O | U | | U | |
| *Carex stipata* | awlfruit sedge | OBL | U | U | U | U | U | | U | | | | U |
| *Carex stricta*[1] | tussock sedge | OBL | U | U | C | O | O | O | O | O | | | O |
| *Carex swanii* | swan sedge | FACU | | U | | | U* | | | | | U* | U |
| *Carex vulpinoidea*[1] | fox sedge | OBL | | | U | | U | U | U / O | U | | | |
| *Carpinus caroliniana* [1] | ironwood | FAC | | | | U | U | ? | | U | | | U |
| *Carya* sp. | hickory | - | U | | | | | | | | | | U |
| *Celastrus orbicultatus* | bittersweet, asiatic | UPL | | | | U | U | U | U | U | | U* | U |
| *Cephalanthus occidentalis* | buttonbush | OBL | | | | | | | | | | | U |
| *Ceratophyllum demersum* | coontail | OBL | | | | | | | U | | | | U |
| *Chamaecrista nictitans* | partridge-pea | FACU | | | | | | | | | | | U |
| *Chamaecyparis thyoides* | Atlantic white cedar | OBL | | | | | | | | | | | U |
| *Chelone glabra* | white turtlehead | OBL | | | | | | | | | | | U |
| *Chimaphila maculata* | spotted wintergreen | - | | | | | | | | | | | U |
| *Chimaphila umbellata* | pipsissewa | - | | | | | | | | | | | U |
| *Cinna arundinacea* | wood reedgrass | FACW | U | | | | | | | | | | U |
| *Cirsium arvense* | Canadian thistle | FACU | | | | | | | | | | | U |
| *Cirsium vulgare* | bull thistle | FACU | | | U | U | U | | U | | | | |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Wetland Indicator Status[2]** | **A** | **A1** | **CN** | **CS** | **CW** | **C1** | **C3** | **F1/F** | **J1** | **VPB** | **Other** |
| *Claytonia virginica* | spring beauty | FACU | | | | | | | U | | | | |
| *Clethra alnifolia* | sweet pepperbush | FAC | U | | | | | | | | | | U |
| *Comptonia peregrina* | sweet fern | - | | U | | | U | U | U | | | U* | U |
| *Cornus amomun* | silky dogwood | FACW | | | | | | | U | U | | | U |
| *Cornus florida* | flowering dogwood | FACU | | | | | | U* | | | | | U |
| *Cornus* sp. | dogwood | - | | | | | | | U | | | | |
| *Crataegus* sp. | hawthorne | - | | | | | U | U | | | | | |
| *Cyperus esculentus* | yellow nutsedge | FACW | | | | | | | | | | | |
| *Cyperus strigosus* | strawcolored flatsedge | FACW | | | | U | | | | | | | |
| *Dactylis glomerata* | orchard grass | FACU | | U | | | U | | | | | | U |
| *Daucus carota* | wild carrot | UPL | | | | | U | | U | | | | U |
| *Dennstaedtia punctilobula* | eastern hayscented fern | UPL | | | | | | | | | | | U |
| *Dianthus armeria* | deptford pink | UPL | | | | U | U | | U | | | U* | U |
| *Dichanthelium clandestinum* | deertongue | FACW | U | | O | O | O | U | U | U | | U | U |
| *Dichanthellum acuminatum* | tapered rosette grass | FAC | | | | | | | | | | | U |
| *Drosera rotundifolia* | roundleaf sundew | OBL | | | | | | | U | | | | |
| *Dryopteris carthusiana* | spinulose woodfern | FACW | | | | | | | | | | | U |
| *Dryopteris intermedia* | intermediate woodfern | FAC | | | | | | | U | | | | |
| *Dryopteris* sp. | woodfern | - | | | U | | | U | U | U | | | U |
| *Dulichium arundinaceum* | three-way sedge | OBL | | | | | | U | | | | | |
| *Echinochola crus-galli* | barnyard grass | FAC | | | | | | | | | | | U |
| *Echinochola muricata* | rough barnyard grass | OBL | | | | | | | | | | | U |
| *Echinochola* sp. | barnyard grass | OBL-FAC | | | U | U | | | | | | | |
| *Elaeagnus umbellata* | autumn olive | - | | | | | U | | U | U | | U* | U |
| *Eleocharis* sp. | spikerush | OBL-FACW | | U | | U | O | | U | | | | |
| *Epilobium ciliatum* | fringed willow-herb | FACW | | | | | U | | | | | | |
| *Epilobium* sp. | willow herb | OBL-FACW | | | U | U | | | U | | | | U |
| *Equisetum* sp. | horsetail | - | | U | U | U | | U | | O | | | U |
| *Erechtites hieracifolius* | American burnweed | - | U | | U | U | | | U | | | | U |
| *Erigeron annuus* | fleabane, white top | FACU | | | | U | U | | U | | | U* | |
| *Eupatorium perfoliatum* | boneset, common | FACW | | | | U | U | | U | | | | U |
| *Euthamia caroliniana* | slender goldentop | FAC | U | | U | | | | U | | | | |
| *Euthamia graminifolia* | flat-top goldentop | FAC | | | | U | O | U | U | | | | U |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| Scientific Name | Common Name | Wetland Indicator Status[2] | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | A1 | CN | CS | CW | C1 | C3 | F1/F | J1 | VPB | Other |
| *Eutrochium maculatum* | spotted Joe-Pye-weed | OBL | | | O | | | | | | | | |
| *Eutrochium* sp. | Joe-Pye weed | - | | | | U | | | U | | | | U |
| *Fallopia scandens* | false buckwheat, climbing | FAC | U | U | U | U | U | U | U | | | | U |
| *Festuca rubra* | red fescue | FACU | | | | | | | | | | | U |
| *Festuca* sp. | fescue | - | | | | | U | | | | | | U |
| *Fragaria virginiana* | wild strawberry | FACU | | | | | | | | | | | U |
| *Frangula alnus* | glossy buckthorn | FAC | | | U* | U | | | | | | | U |
| *Fraxinus americana* | white ash | FACU | | | | | | | | | | | U |
| *Fraxinus pennsylvanica*[1] | green ash | FACW | | | | U | U | U | U | U | | | U |
| *Galium asprellum* | rough bedstraw | OBL | | | U | | U | U | U | | | | |
| *Galium mollugo* | white bedstraw | FACU | | | | | U | | U | | | | U |
| *Galium palustre* | marsh bedstraw | OBL | | U | O | U | U | | U | | | | U |
| *Galium* sp. | bedstraw | - | | | | | | U | | | | | |
| *Gaylussacia baccata* | black huckleberry | FACU | | | | | U | | | | | | U |
| *Glechoma hederacea* | ground ivy | FACU | | | | | U | | | | | | |
| *Glyceria canadensis* | rattlesnake grass | OBL | | | | U | | | | | | | |
| *Glyceria grandis* | American manna grass | OBL | | | | O | U | | U | | | | |
| *Glyceria maxima* | reed manna grass | OBL | | U | | | | | | | | | |
| *Glyceria striata* | mannagrass | OBL | O | | | O | U | | U | U | | | U |
| *Hackelia virginiana* | Virginiana stickseed | FACU | | | U | | U | | | | | | U |
| *Hamamelis virginiana* | witch-hazel | FACU | | | | | | | | | | | U |
| *Hepaticae* | liverwort | - | | | | | | | | | | | U |
| *Hieracium sp.* | hawkweed | - | | | | U | | | | | | | |
| *Holcus lanatus* | common velvetgrass | FACU | | | | | | | U | | | | U |
| *Houstonia caerulea* | bluets | FACU | | | | | U | | | | | | U |
| *Hydrocotyle* sp. | pennywort | - | | | | | | | | | | | U |
| *Hypericum mutilum* | dwarf St. Johnswort | FACW | | | | | | | | | | | U |
| *Hypericum punctatum* | St. Johnswort, dotted | FAC | | | | | U | | | | | | U |
| *Ilex verticillata*[1] | winterberry, common | FACW | U | U | | U | | | U | | | | U |
| *Impatiens capensis* | touch-me-not, spotted | FACW | U | U | O | O | U | U | O | O | | | U |
| *Iris versicolor* | blue flag | OBL | | | | U | | | | | | | U |
| *Juncus acuminatus* | tapertip rush | OBL | | | | | | | | | | | |
| *Juncus anthelatus* | Wiegand's rush | FACW | | | | | | | U | | | | |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Wetland Indicator Status[2]** | **A** | **A1** | **CN** | **CS** | **CW** | **C1** | **C3** | **F1/F** | **J1** | **VPB** | **Other** |
| *Juncus canadensis* | Canada rush | OBL | | | | U | | | U | | | | U |
| *Juncus effusus*[1] | soft rush | OBL | U | O | O | U | U | U | O | U | | | U |
| *Juncus sp.* | rush | | U | | | U | | U | | | | | |
| *Juncus tenuis* | slender rush | FAC | | | | U | U | U | U | | | | U |
| *Lactuca* sp. | wild lettuce | - | | | | | | | | | | | U |
| *Lamium amplexicaule* | henbit deadnettle | - | | | | | | | | | | | U |
| *Leersia oryzoides*[1] | rice cutgrass | OBL | C | U | | C | U | | U | | | | |
| *Lemna minor* | duckweed | OBL | | | U | U | U | | | | | | U |
| *Lepidium campestre* | field pepperweed | - | | | | | | | | | | | U |
| *Lespedeza capitata* | bush clover, round head | FACU | | | | | | | | | | | U |
| *Leucanthemum vulgare* | oxeye daisy | UPL | | | | | U | | | | | | U |
| *Lindera benzoin*[1] | spicebush | FACW | | | | | | | U | | | | U |
| *Lonicera japonica* | Japanese honeysuckle | FACU | | | | | | | | | | | U |
| *Lonicera morrowii* | Morrow's honeysuckle | FACU | | | | U | | | | | | | U |
| *Lonicera* sp. | honeysuckle (shrub) | - | | | | | | | | U | | | |
| *Lotus corniculatus* | bird-foot trefoil | FACU | | | | | U | | U | U | | | U |
| *Ludwigia alternifolia* | seedbox | OBL | | | | | U | | | | | | |
| *Ludwigia palustris* | water purslane | OBL | | | | U / O | O | | U | | | | U |
| *Lycopus americanus* | American bugleweed | OBL | | U | | U | | | | | | | |
| *Lycopus* sp. | bugleweed | - | | | | | | | | | | | U |
| *Lycopus uniflorus* | northern bugleweed | OBL | | | | | U | | U | | | | U |
| *Lycopus virginicus* | Virginina water- horehound | OBL | | | | | | | | | | | U |
| *Lyonia ligustrina* | maleberry | FACW | U | | U | | U | U | | | | | U |
| *Lysimachia quadrifolia* | whorled loosestrife | OBL | | | | | U | | | | | | U |
| *Lysimachia terrestris* | earth loosestrife | OBL | | | | | | | | | | | U |
| *Lythrum salicaria* | purple loosestrife | OBL | | | U | U | U | U | | | | | U |
| *Maianthemum canadense* | Canada mayflower | FACU | | | | | | | | | | | U |
| *Malus* sp. | crabapple | - | | | | | | | U | | | | U |
| *Matteuccia struthiopteris* | ostrich fern | FAC | | | | | | | | | | | U |
| *Microstegium vimineum* | Japanese stilt grass | FAC | U | O | U / O | U | U | | O | | | | U |
| *Mimulus ringens* | monkey-flower | OBL | | U | U | U | U | | | | | | U |
| *Monotropa uniflora* | indian pipe | FACU | | | | | | | | | | | U |
| *Morus* sp. | mulberry | FACU | | | | | | | | | | | U |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Wetland Indicator Status[2]** | **A** | **A1** | **CN** | **CS** | **CW** | **C1** | **C3** | **F1/F** | **J1** | **VPB** | **Other** |
| *Musci* | moss | - | | | | | | | | | | | U |
| *Myosotis laxa* | small forget-me-not | OBL | | | U | U | | | | | | | U |
| *Nasturtium microphyllum* | one-row watercress | OBL | | | | U | | | U | | | | U |
| *Oenothera biennis* | evening primrose | FACU | | | | | | | | | | | U |
| *Onoclea sensibilis* | sensitive fern | FACW | O | U | O | O | U | O | U | O | | U | U |
| *Opuntia humifusa* | prickly pear cactus | - | | | | | | | | | | | U |
| *Osmunda claytoniana* | interrupted fern | FAC | | | | U | | | | | | | U |
| *Osmunda spectabilis*[1] | royal fern | OBL | U | | U | | | | U | | | | U |
| *Osmundastrum cinnamomeum* [1] | cinnamon fern | FACW | U | U | U | U | O | U | U | | | | U |
| *Oxalis stricta* | wood sorrel | FACU | U | | | | | | U | | U | | U |
| *Panicum dichotomiflorum* | fall panic grass | FACW | | | | | | | | | | | U |
| *Panicum virgatum* | switch grass | FAC | | | | | O | U | U | | | | U |
| *Parathelypteris noveboracensis* | New York fern | FAC | | | | | | U | | | | | U |
| *Parathelypteris simulata* | Massachusetts fern | FACW | | | | | | | | | | | U |
| *Parthenocissus quinquefolia* | Virginia creeper | FACU | U | | | | U | U | U | U | | | U |
| *Penthorum sedoides* | ditch stonecrop | OBL | | | | | | | | | | | U |
| *Persicaria arifolia* [1] | halberd-leaf tearthumb | OBL | U | O | | U | U | | U | U | | | U |
| *Persicaria hydropiperoides* | swamp smartweed | OBL | | | O | U / O | O | | U | | | | U |
| *Persicaria maculosa* | lady's thumb | FAC | | | | U | U | | | | | | U |
| *Persicaria sagittata* | arrow-leaf tearthumb | OBL | U | U | U | O | U | | O | | | | U |
| *Phalaris arundinacea* | reed canary grass | FACW | U | U | U | U | U | | U | U | U | | U |
| *Phellodendron* sp. | corktree | - | | U* | | | | | U* | | | | U |
| *Phleum pratense* | timothy | FACU | | | | | | | U* | | | | U |
| *Phragmites australis* | common or great reed | FACW | | | | U | | | U | | | | O |
| *Phytolacca americana* | American pokeweed | FACU | | | | U | | | | | | | |
| *Pilea pumila* | clearweed | FACW | | | | | U | | | | | | U |
| *Pinus strobus* | white pine | FACU | | | | | | | U* | | | | U |
| *Plantago lanceolata* | English plantain | FACU | | | | | U | | | | | | U |
| *Plantago major* | common plantain | FACU | | | | | | | | | | | U |
| *Platanthera psycodes* | lesser purple fringed orchid | FACW | | | | U | | | | | | | |
| *Platanus occidentalis* | sycamore | FACW | | | | | U | | | | | | U |
| *Poa palustris* | fowl bluegrass | FACW | | | | U | U | | U | | | | |
| *Polygonatum biflorum* | Solomon's seal | FACU | | | | | | | | | | | U |
| *Polystichum acrostichoides* | christmas fern | FACU | | | | | | | | | | | U |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| Scientific Name | Common Name | Wetland Indicator Status[2] | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | A1 | CN | CS | CW | C1 | C3 | F1/F | J1 | VPB | Other |
| *Populus deltoides* | eastern cottonwood | FAC | | | | U | U | U | | | | | U |
| *Populus grandidentata* | big-toothed aspen | FACU | | | | | | | | | | | U |
| *Populus* spp. (seedlings) | aspen / poplar | - | | | | | | U | U | | | | |
| *Populus tremuloides* | trembling aspen | FACU | | | | | U | U* | U | | | | U |
| *Potamogeton foliosus* | leafy pondweed | OBL | | | | U | | | | | | | U |
| *Potamogeton* sp. | pondweed | - | | | | U | | | U | | | | U |
| *Potentilla canadensis* | dwarf cinquefoil | - | | | | | | U | | U | | | U |
| *Potentilla recta* | sulfur cinquefoil | - | | | | | | | | | | | U |
| *Potentilla simplex* | cinquefoil, old field | FACU | | U | | U | U | U | | | U | U* | U |
| *Prunella vulgaris* | common selfheal | FACU | | | | | | | | | | | U |
| *Pycnanthemum muticum* | clustered mountainmint | FAC | | | | | | | | | | | U |
| *Quercus alba* | white oak | FACU | | | | | U | | | U | | | U |
| *Quercus rubra* | red oak | FACU | | | | | | | | U | | | U |
| *Quercus velutina* | black oak | - | | | | | | | | | | | U |
| *Ranunculus recurvatus* | hooked buttercup | FACW | | | | | | | | | | | U |
| *Ranunculus repens* | spotted buttercup | FAC | | | U | | | | U | | | | U |
| *Ranunculus* sp. | buttercup | - | | | | U | U | | U | | | | |
| *Rhododendron periclymenoides* | pink azalea | FAC | | | | | | | | | | | U |
| *Rhododendron viscosum* | swamp azalea | FACW | | | | | U | | | | | | U |
| *[Riccia]* sp. | riccia | - | | | | U | | | U | | | | |
| *Robinia pseudoacacia* | black locust | FACU | | | | | | | | | | | U |
| *Rosa multiflora* | multiflora rose | FACU | | | U | U | U | U* | U | U | | U* | U |
| *Rosa palustrus* | swamp rose | OBL | | | | | | | U | | | | U |
| *Rubus allegheniensis* | Allegheny blackberry | FACU | | | | U | U | | U | | | | U |
| *Rubus flagellaris* | northern dewberry | FACU | U | U | | U | U | | O | U | | U* | U |
| *Rubus hispidus* | swamp dewberry | FACW | | | | | U | U | ? | | | U | U |
| *Rubus idaeus* | red raspberry | FACU | | | U | U | U | U | U | | | | U |
| *Rubus occidentalis* | black raspberry | - | | | U | | U | | | | U | | U |
| *Rudbeckia hirta* | black-eyed susan | FACU | | | | | | | | | | | U |
| *Rumex acetosella* | common sheep sorrel | FACU | | | | | | | | | | | U |
| *Rumex crispus* | curley dock | FAC | | | | | U | | | | | | U |
| *Rumex* sp. | dock | - | | | | | U | | | | | | |
| *Sagittaria latifolia* | arrow-head | OBL | | | O | U | | | | | | | |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Wetland Indicator Status[2]** | **A** | **A1** | **CN** | **CS** | **CW** | **C1** | **C3** | **F1/F** | **J1** | **VPB** | **Other** |
| *Salix alba* | white willow | FACW | | | | | | | | | | | U |
| *Salix bebbiana* | bebb willow | FACW | | | [U] | | | | U | | | | U |
| *Salix discolor* | pussy willow | FACW | | | [U] | | U | | U | | | U | U |
| *Salix nigra* | black willow | OBL | | | | | | | | | | | U |
| *Salix* sp. (including hybrids) | willow | - | | | U | U | U | C | U | | | | |
| *Sambucus nigra* | elderberry | FACW | | | | | | | | | | | U |
| *Sassafras albidum* | sassafras | FACU | | | | | | | | | | | U |
| *Schizachyrium scoparium* | little bluestem | FACU | | | | | | | | | | | U |
| *Schoenoplectus tabernaemontani* | softstem bulrush | OBL | | | | | | | | | | | U |
| *Scirpus atrovirens* | dark green bulrush | OBL | | | | | U | | U | | | | |
| *Scirpus cyperinus*[1] | woolgrass | OBL | | U | O | O | O | U | O | | | O | U |
| *Scirpus expansus* | woodland bulrush | OBL | O | O | O | O | U | U | O | | | | U |
| *Securigera varia* | crown vetch | - | | | | U | O | | U | | | | |
| *Selaginella [apoda]* | meadow spikemoss | FACW | | | | | | | | | | | U |
| *Setaria parviflora* | marsh bristlegrass | FAC | | | | | | | | | | | U |
| *Setaria pumila* | yellow foxtail | FAC | | | O | | O | | | | | | |
| *Setaria* sp. | foxtail | - | | | U | | U | | | | | | U |
| *Setaria viridis* | green bristlegrass | - | | | | | | | | | | | U |
| *Sisyrinchium* sp. | blue-eyed grass | - | | | | U | | | | | | | |
| *Smilax glauca* | cat greenbriar | FACU | | | | | | | | | | | U |
| *Smilax rotundifolia* | greenbrier | FAC | | | | | U | | | | | | U |
| *Solanum dulcamara* | climbing nightshade | FAC | U | | | | | | U | | | | U |
| *Solidago altissima* | goldenrod, tall | FACU | | | | | U | | U | | | | U |
| *Solidago canadensis* | Canada goldenrod | FACU | | | | | [U] | | U | | | | U |
| *Solidago gigantea* | Late goldenrod | FACW | | | | | | | U | C | | | U |
| *Solidago juncea* | early goldenrod | - | | | | | | | | | | | U |
| *Solidago rugosa* | wrinkled-leaved goldenrod | FAC | U | | U | U | U | U | U | | | | U |
| *Solidago* sp. | goldenrod | - | U | O | O | U | U | U | U | | U | | U |
| *Sonchus* sp. | sow thistle | - | | | U | U | U | | U | | | | U |
| *Sparganium americanum*[1] | American burreed | OBL | | | U | U | U | | U | | | | U |
| *Sphagnum* sp. | sphagnum moss | - | | | | U | U | | U | | | | U |
| *Spiraea latifolia*[1] | broad leaf meadowsweet | FACW | | | | U | | U | | | | | U |
| *Spiraea tomentosa*[1] | steeplebush | FACW | | U | U | U | O | U | U | O | | U* | U |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Wetland Indicator Status[2]** | **A** | **A1** | **CN** | **CS** | **CW** | **C1** | **C3** | **F1/F** | **J1** | **VPB** | **Other** |
| *Spiranthes cernua* | white nodding lady's tresses | FACW | | | | | | | U | | | | |
| *Spirodela polyrrhiza* | greater duckweed | OBL | | | | | | | | | | | U |
| *Stellaria graminea* | grass-like starwort | FACU | | | | | U | | | | | | |
| *Symphyotrichum dumosum* | bush aster | FAC | | | | | U | | | | | | U |
| *Symphyotrichum lanceolatum* | white panicle aster | FACW | | | | | | | | | | | U |
| *Symphyotrichum lateriflorum* | small white aster | FAC | | | | | U | | | | | | U |
| *Symphyotrichum novi-belgii* | New York Aster | FACW | | | | | U | | U | | | | U |
| *Symphyotrichum puniceum*[1] | puplestem aster | OBL | | | | | | | | | | | U |
| *Symphyotrichum racemosum* | white flowered American aster | FACW | | | | | | | | | | | U |
| *Symplocarpus foetidus*[1] | skunk cabbage | OBL | U | U | U | U | U | U | U | | | | U |
| *Taraxacum officinale* | common dandelion | FACU | | | | | U | | U | | | | U |
| *Thalictrum thalictroides* | rue-anemone | FACU | | | | | | | | | | | U |
| *Thelypteris palustris*[1] | marsh fern | FACW | | U | U | U | U | | U | | | | U |
| *Thlaspi arvense* | field pennycress | UPL | | | | | U | | | | | | U |
| *Toxicodendron radicans* | poison ivy | FAC | | | U | U | U | | U | | | | U |
| *Toxicodendron vernix* | poison sumac | OBL | | | U* | | | | | | | | U |
| *Triadenum virginicum* | Virginia marsh St. Johnswort | OBL | | | U | | U | | | | | | U |
| *Trifolium hybridum* | alsike clover | FACU | | | | U | | | | | | | |
| *Trifolium pratense* | red clover | FACU | | | | | U | | U | U | | | U |
| *Trifolium repens* | white clover | FACU | | | | | | | | | U | | U |
| *Tsuga canadensis* | eastern hemlock | FACU | | | | | | | | | | | U |
| *Tussilago farfara* | coltsfoot | FACU | | | U | | | | U | | | | U |
| *Typha angustifolia* | narrow-leaf cattail | OBL | | | U | U | U | | | | | | U/O |
| *Typha latifolia* | broad-leaf cattail | OBL | | | U | U | O | | U | | | U | O |
| *Ulmus americana*[1] | American elm | FACW | | | | | | | U | | | | U |
| *Urtica dioica* | stinging nettle | FAC | | | | U | U | | U | | | | |
| *Utricularia macrorhiza* | common bladderwort | OBL | | | | | U | | U | | | | U |
| *Vaccinium angustifolium* | lowbush blueberry | FACU | | | | | | | | | | | U |
| *Vaccinium corymbosum*[1] | highbush blueberry | FACW | | | U | U | U | | U | | | | U |
| *Veratrum viride* | false hellabore, green | FACW | | | | | | | | | | | U |
| *Verbascum thaspus* | mullein | - | | | | | U | | U | | | | U |
| *Verbena hastata* | blue vervain | FACW | | U | O | O | O | | U | | | | U |
| *Verbena urticifolia* | white vervain | FAC | | | | U | | | | | | | |
| *Veronica officinalis* | common speedwell | FACU | | | | | | | | | | | U |
| *Viburnum acerifolium* | maple-leaved viburnum | UPL | | | | | | | | | | | U |

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| Scientific Name | Common Name | Wetland Indicator Status[2] | Plant Species Abundance - Percent Areal Cover (A = Abundant >75%, C = Common 24%-74%, O=Occasional 5%-24%, U=Uncommon <5%)[3] Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | A1 | CN | CS | CW | C1 | C3 | F1/F | J1 | VPB | Other |
| *Viburnum dentatum* [1] | arrowwood | FAC | U | U | | U | U | | U | | | | U |
| *Viburnum dilatatum* | linden arrowwood | - | | | | | | | | | | | U |
| *Vicia cracca* | cow vetch | - | | U | U | U | O | | U | | O | | U |
| *Vicia* sp. | vetch | - | | | | | U | | | | | | |
| *Viola sororia* | hooded blue violet | FAC | | | | | | | | | | | U |
| *Viola sp.* | violet | - | | | | | | | U | | | | |
| *Vitis labrusca* | fox grape | FACU | | | U* | U | U | | U | U | | | U |
| *Wolffia* sp. | watermeal | OBL | | | U / O | U | U | | U | | | | |

| SUMMARY SPECIES TOTALS BY AREA & ABUNDANCE | | Wetland Mitigation Area | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | A1 | CN | CS | CW | C1 | C3 | F1/F | J1 | VPB | Other |
| Total Abundant Species | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Common Species | | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Total Occasional Species | | 4 | 5 | 11 | 12 | 12 | 3 | 9 | 7 | 1 | 1 | 4 |
| Toral Uncommon Species | | 29 | 27 | 47 | 36 | 90 | 35 | 84 | 22 | 6 | 6 | 238 |
| Total Species | | 33 | 32 | 60 | 49 | 102 | 38 | 93 | 30 | 7 | 7 | 242 |
| **Total Species Observed in 2017** | **309** | | | | | | | | | | | |
| **Total Species in Mititgation Sites** | **161** | | | | | | | | | | | |

Notes:
Scientific names follow nomenclature used by US Army Corps of Engineers National Wetland Plant List (NWPL 2016).
Species not listed in NWPL 2016 follow Gleason & Chronquist 1982 (nomenclature updated to USDA Plants Database recognized species).
Species with NWPL 2016 names that differ from Gleason & Chronquist 1982 are listed on the following page of synonyms.
[species] = tentative identification
1. Species included in wetland plantings - Wetland Mitigation Plan, Remedial Action Plan Implementation
2. NWPL 2016 wetland indicator status:
   OBL = Obligate Wetland species (estimated probability of occurrence in wetlands >99%)
   FACW = Facultative Wetland species (estimated probability of occurrence in wetlands 67 - 99%)
   FAC = Facultative species (estimated probability of occurrence in wetlands 34 - 66%)
   FACU = Facultative Upland species (estimated probability of occurrence in wetlands 1 - 33%)
   UPL = Upland species (estimated probability of occurrence in wetlands <1%)
   - = not listed
3. Abundance Key: A - Abundant (greater than 75% cover); C - Common (25% - 74% cover); O - Occasional (5% - 24% cover); U - Uncommon (<5% cover)
* Indicates plants found in upland along wetland edge.

Table 1. Plant Inventory
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| Scientific Name per National Wetland Plant List | Synonym | Common Name |
|---|---|---|
| *Agrostis gigantea* | *Agrostis alba* | redtop |
| *Alnus incana* | *Alnus rugosa* | speckled alder |
| *Bidens tripartita* | *Bidens connata* | swamp beggar-ticks |
| *Calamagrostis coarctata* | *Calamagrostis cinnoides* | arctic reedgrass |
| *Chenopodium rubrum* | *Chenopodium humile* | pigweed, marshland |
| *Dasiphora fruticosa* | *Potentilla fruticosa* | shrubby cinquefoil |
| *Dichanthelium clandestinum* | *Panicum clandestinum* | deertongue |
| *Dryopteris carthusiana* | *Dryopteris spinulosa* | spinulose woodfern |
| *Eleocharis obtusa* | *Eleocharis ovata* | blunt spikerush |
| *Erigeron canadensis* | *Conyza canadensis* | Canadian horseweed |
| *Eurybia divaricata* | *Aster divaricatus* | white wood aster |
| *Euthamia caroliniana* | *Euthamia galetorium, E. tenuifolia* | slender goldentop |
| *Eutrochium* sp. | *Eupatoriadelphus* sp. / *Eupatorium* sp. | Joe-Pye weed |
| *Fallopia scandens* | *Polygonum scandens* | false buckwheat, climbing |
| *Festuca trachyphylla* | *Festuca brevipila* | hard fescue |
| *Frangula alnus* | *Rhamnus frangula* | glossy buckthorn |
| *Hypericum virginicum* | *Triadenum virginicum* | Virginia marsh St. Johnswort |
| *Microthlaspi perfoliatum* | *Thlaspi perfoliatum* | claspleaf pennycress |
| *Nasturtium microphyllum* | *Rorippa microphylla* | one-row watercress |
| *Osmunda spectabilis* | *Osmunda regalis* | royal fern |
| *Osmundastrum cinnamomeum* | *Osmunda cinnamomea* | cinnamon fern |
| *Parathelypteris noveboracensis* | *Thelypteris noveboracensis* | New York fern |
| *Platanthera psycodes* | *Habeneria psycodes* | lesser purple fringed orchid |
| *Parathelypteris simulata* | *Thelypteris simulata* | Massachusetts fern |
| *Persicaria arifolia* | *Polygonum arifolium* | halberd-leaf tearthumb |
| *Persicaria hydropiperoides* | *Polygonum hydropiperoides* | swamp smartweed |
| *Persicaria maculosa* | *Polygonum persicaria* | lady's thumb |
| *Persicaria posumbu* | *Polygonum cespitosum* | Asiatic lady's thumb |
| *Persicaria punctata* | *Polygonum punctatum* | dotted smartweed |
| *Persicaria sagittata* | *Polygonum sagittatum* | arrow-leaf tearthumb |
| *Sambucus nigra* | *Sambucus canadensis* | elderberry |
| *Schoenoplectus acutus* | *Scirpus acutus* | hard stem bulrush |
| *Schoenoplectus fluviatilis* | *Scirpus fluviatilis* | river bulrush |
| *Setaria parviflora* | *Seteria geniculata* | marsh bristlegrass |
| *Setaria pumila* | *Setaria glauca* | yellow foxtail |
| *Spiraea latifolia* | *Spirea alba* | broad leaf meadowsweet |
| *Symphyotrichum dumosum* | *Aster dumosus* | bush aster |
| *Symphyotrichum lanceolatum* | *Aster lanceolatus / simplex* | white panicle aster |
| *Symphyotrichum lateriflorum* | *Aster lateriflorus* | calico aster |
| *Symphyotrichum lateriflorum* | *Aster vimineus* | small white aster |
| *Symphyotrichum novi-belgii* | *Aster novibelgii* | New York Aster |
| *Symphyotrichum puniceum* | *Aster puniceus* | puplestem aster |
| *Utricularia macrorhiza* | *Utricularia vulgaris* | common bladderwort |

Table 2. Surface Water Levels
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

Staff Gauge Readings in Feet

| | Wetland Area & Staff Gauge Number | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | A ASG1 | C North CNSG1 | C North CNSG2 | C South CSSG1 | C South CSSG2 | C West CWSG1 | C West CWSG2 | C3 C3SG1 | C3 C3SG2 | C CSG1B | C CSG2 | C Outlet CSBTSG |
| 4/28/2017 | 0.39 | 2.32 | 2.15 | 1.66 | 1.00 | 3.00 | 3.04 | 0.50 | 2.82 | 1.70 | 1.10 | 1.24 |
| 8/10/2017 | 0.38 | 2.26 | 2.03 | 1.63 | 1.06 | 3.28 | 2.83 | 0.30 | 2.69 | 1.10 | 1.14 | 1.14 |
| 11/9/2017 | 0.37 | 2.30 | 1.97 | 0.42 | dry | NR | 2.88 | 0.41 | 2.60 | 1.26 | 1.12 | 1.09 |

Note:
Add 0.95 to CSG1B readings to compare with CSG1A readings taken in years 2008 - 2014.
NR = no reading due to dense vegetation obscuring gauge.

Vernal Pool Maximum Water Depth in Feet

| Date | VPB | VP3 | VP4 | VP7 |
|---|---|---|---|---|
| 4/28/2017 | 2.00 | 0.40 | 0.78 | 1.00 |
| 8/10/2017 | 1.00 | 0.12 | 0.12 | 0.40 |
| 11/9/2017 | 1.80 | 0.15 | dry | 0.85 |

Note that VPB was observed dry October 3, 2017 - see Figure 9 and Appendix A Photographs.

Table 3. Groundwater Levels
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

Depth Below Ground to Standing Water, In Feet[1]

| Well Number | A1MW1WET | A1MW1UP | CNMW2WET | CSMW2WET | CWMW2WET | CWMW2UP | CWMW3WET | VP3MW1WET | C3MW1WET | C3MW1UP | C3MW2WET | C3MW2UP | C3MW3WET | C3MW3UP | C3MW4WET | CMW1WET | CMW2WET | CMW3WET | BMW1WET | DMW1WET | FMW1WET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wetland Area | A1 | | CN | CS | CW | | CW | VP3 | C3 | | C3 | | C3 | | C3 | C | C | C | B | D | F |
| Well/Well Pair | MW1 | | MW2 | MW2 | MW2 | | MW3 | MW1 | MW1 | | MW2 | | MW3 | | MW4 | MW1 | MW2 | MW3 | MW1 | MW1 | MW1 |
| Date | Wet | Up | Wet | Wet | Wet | Up | Wet | Wet | Wet | Up | Wet | Up | Wet | Up | Wet | Wet | Wet | Wet | Wet | Wet | Wet |
| Growing Season observed to begin week of 4/9/17 | | | | | | | | | | | | | | | | | | | | | |
| 4/28/2017 | 0.38 | 2.07 | 0.75 | 0.80 | 0.05 | 3.63 | 1.23 | 0.61 | 0.22 | 1.27 | 0.38 | 1.89 | 0.97 | 1.50 | 0.23 | 0.20 | 0.07 | 0.96 | 2.36 | 0.79 | 0.84 |
| 8/10/2017 | 0.34 | dry | 1.26 | 0.90 | -0.03 | dry | 1.89 | 1.09 | 0.58 | dry | 0.92 | dry | 1.49 | muck | 1.29 | -0.80 | 0.08 | 1.26 | muck | 1.81 | dry |
| 11/9/2017 | 0.33 | dry | 0.91 | 2.07 | 0.04 | dry | 1.62 | 1.04 | 0.65 | dry | 0.82 | dry | 1.56 | dry | 1.04 | -0.12 | 0.41 | 2.30 | dry | 1.42 | dry |
| Growing Season Ends +/- | | | | | | | | | | | | | | | | | | | | | |

Note: 1. Positive values show water depth below ground, negative numbers show water level in well riser above ground (indicating artesian conditions).
Observed first growing season indicators during week of 4/9/17.

Table 4. 2017Wildlife Observations
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | Wetland Mitigation Area | | | | | | | | Other Area | | | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | A | A1 | C1 | C3 | C South | C North | C West | VPB | C | F/F1 | VP7 | HEEP |
| **MACROINVERTEBRATES** | | | | | | | | | | | | | |
| *Amynthas agrestis* | Crazy Snake Worm | | | | | | | | | | | | ✓ |
| *Ancyloxpha numitor* | Least Skipper | | | | | ✓ | ✓ | | | | | | |
| *Apis mellifera* | Honey Bee | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |
| *Argiope* sp. | Orb Weaver Spider | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | | | |
| *Artogeia rapae* | Cabbage White Butterfly | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | | | |
| *Bombus* sp. | Bumble Bee | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Brasilarchia astyanax* | Red Spotted Purple Butterfly | | | | | ✓ | | ✓ | | | | | ✓ |
| *Catocala amatrix* | Sweetheart Underwing | | | | | | | | ✓ | | | | |
| *Cercyonis pegala* | Common Wood-nymph | | | | ✓ | | | | | | | | |
| F: Chironomidae | Midge | | | | | | | | ✓ | | | | |
| *Chrysops* sp. | Deer Fly | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | |
| Cladocera | Water Flea | | | | ✓ | | | | ✓ | | | | |
| C: Copepoda | Copepod | | | | | | | | ✓ | | | | |
| F: Corixidae | Water Boatman | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | | |
| F: Culicidae | Mosquito | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Danaus plexippus* | Monarch Butterfly | | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | |
| *Dermacentor variabilis* | Wood Tick | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| O: Diptera | Phantom Midge | | | | | | | | ✓ | | | | |
| *Dolichovespula maculata* | Bald-faced (White-faced) Hornet | | | ✓ | ✓ | | | ✓ | ✓ | | | | |
| *Dolomedes triton* | Six-spotted Fishing Spider | ✓ | ✓ | | | ✓ | | ✓ | ✓ | | ✓ | | |
| F: Dytiscidae | Predaceous Diving Beetle | | | | | | | | ✓ | | | | ✓ |
| *Everes comyntas* | Eastern Tailed Blue Butterfly | | | | ✓ | | | ✓ | | | ✓ | | |
| O: Ephemeroptera | Mayfly | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| *Galerucella* sp. | Loosestrife Beetle | | | ✓ | | | | | | | | | |
| F: Gerridae | Water Strider | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| *Gryllus pennsylvanicus* | Field Cricket | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| *Gyrinus* sp. | Whirligig Beetle | | | | ✓ | ✓ | | | ✓ | | | | |
| C: Hirundinae | Leech | | | | ✓ | | ✓ | | | ✓ | | | |
| O: Isopoda | Isopod | | | | | | | | ✓ | | | | |
| *Ixodes scapularis* | Deer Tick | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *[Lethocerus]* | Toe Biter Beetle | | | | | ✓ | ✓ | | | | | | |
| *Limenitis arthemis* | Red-spotted Purple | | | | | | | | | | | | |
| *Junonia coenia* | Common Buckeye | | | | | ✓ | | | | | | | |
| *Micrathena sagittata* | Arrow-shaped Micrathena | | | | | | ✓ | | | | | | |
| F: Nepidae | Water Scorpion | | | | ✓ | | ✓ | | ✓ | | | | |
| F: Notonectidae | Backswimmer | | | | ✓ | ✓ | | ✓ | ✓ | | | | |
| *Megisto cymela* | Little Wood-Satyr | | | | ✓ | | | | | | | | |
| *Nymphalis antiopa* | Mourning Cloak Butterfly | | | | | | ✓ | | | | | | |
| *[Orconectes* sp.*]* | Crayfish | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |
| O: Orthoptera | Grasshopper | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | ✓ | | |
| *Papilio polyxenes* | Black Swallowtail Butterfly | | | | ✓ | | ✓ | | | ✓ | | | |
| *Papilio sp.* | Swallowtail Butterfly species | | ✓ | | | | | ✓ | | | | | |
| *Phyciodes tharos* | Pearly Crescentspot | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Pholisora catullus* | Common Sootywing | | | | ✓ | | ✓ | | | | | | |
| Pieridae | Sulfur Butterfly | | | | ✓ | | | ✓ | | | | | |
| *Pieris rapae* | Cabbage White Butterfly | | | | ✓ | ✓ | ✓ | ✓ | | | | | |
| *Poecilocapsus lineatus* | Four-lined Plant Bug | | | | | ✓ | | | | | | | |
| *Polistes* sp. | Paper Wasp | | | | ✓ | | | ✓ | | | | | |
| *Popillia japonica* | Japanese Beetle | | ✓ | | | ✓ | | | | | | | |
| *[Pseudosuccinea collumella]* | Freshwater Snail | | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | |
| *Pterourus glaucus* | Tiger Swallowtail Butterfly | ✓ | | | ✓ | ✓ | | | | | ✓ | | |
| *Simulium* sp. | Black Fly | | | | | | | | ✓ | ✓ | | | |
| *Speyeria cybele* | Great Spangled Fritillary Butterfly | ✓ | ✓ | | ✓ | | | | | | ✓ | | |
| *Tenodera aridifolia* | Chinese Mantind | | | | ✓ | ✓ | | ✓ | | | | | |
| O: Tricoptera | Caddisfly | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| *Vanessa atlanta* | Red Admiral Butterfly | | | | | ✓ | | | | | | | |
| *Vespula* sp. | Yellow Jacket | | | | | | | ✓ | | ✓ | | | |

Table 4. 2017Wildlife Observations
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | Wetland Mitigation Area | | | | | | | | Other Area | | | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | A | A1 | C1 | C3 | C South | C North | C West | VPB | C | F/F1 | VP7 | HEEP |
| **Dragonflies & Damselflies** | | | | | | | | | | | | | |
| *Aeshna clepsydra* | Mottled Darner | | | | | | | ✓ | | | | | |
| *Aeshna* sp. | Darner | | | ✓ | ✓ | ✓ | | ✓ | | | | | |
| *Amphiagrion saucium* | Eastern Red Damsel | | | | ✓ | | | | | | | | |
| *Anax junius* | Common Green Darner | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |
| *Arigomphus villosipes* | Unicorn Clubtail | | | | ✓ | ✓ | | | ✓ | | | | |
| *Argia fumipennis* | Variable Dancer | | | | ✓ | | | | ✓ | | | | |
| *Calopteryx maculata* | Ebony Jewelwing | ✓ | | | | | | | ✓ | | | | |
| *Celithemis elisa* | Calico Pennant | | | | ✓ | | | | | | | | |
| *Celithemis eponina* | Halloween Pennant | | | | | | | | | | | | |
| *Chromagrion conditum* | Aurora Damsel | | | | | ✓ | | | ✓ | | | | |
| *Enallagma minusculum* | Little Bluet | | | | ✓ | ✓ | | ✓ | | | | | |
| *Enallagma* sp. | Bluet Damselfly | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| *Epiaeschna heros* | Swamp Darner | | | | | | | ✓ | | | | | |
| *Erythemis simplicicollis* | Eastern Pondhawk | | ✓ | | ✓ | ✓ | ✓ | | | | | | |
| *Ischnura posita* | Fragile Forktail | ✓ | ✓ | | ✓ | | | | ✓ | | | | |
| *Ischnura verticalis* | Eastern Forktail | | | | ✓ | ✓ | | | | | | | |
| *Leucorrhinia frigida* | Frosted Whiteface | | | | ✓ | | | | | | | | |
| *Leucorrhinia intacta* | Dot-tailed Whiteface | | | | ✓ | ✓ | ✓ | | | | | | |
| *Lestes sp.* | spreadwing | | | | | | | ✓ | | | | | |
| *Lestes congener* | Spotted Spreadwing | | | | | ✓ | | | | | | | |
| *Lestes rectangularis* | Slender Spreadwing | | | | | | | ✓ | | | | | |
| *Lestes unguiculatus* | Lyre-tipped Spreadwing | | | | | ✓ | | ✓ | | | | | |
| *Libellula cyanea* | Spangled Skimmer | | | | ✓ | ✓ | | | | | | | |
| *Libellula deplanata* | Blue Corporal | | | | ✓ | ✓ | ✓ | | | | | | |
| *Libellula exusta* | White Corporal | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| *Libellula incesta* | Slaty Skimmer | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | | | |
| *Libellula luctuosa* | Widow Skimmer | | ✓ | | ✓ | | ✓ | ✓ | ✓ | | | | |
| *Libellula [Plathemis] lydia* | Common Whitetail | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| *Libellula pulchella* | Twelve-spotted Skimmer | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| *Libellula semifasciata* | Painted Skimmer | | | | | ✓ | | | | | | | |
| *Nehalennia irene* | Sedge Sprite | | | | ✓ | ✓ | ✓ | | | | | | |
| *Pachydiplax longipennis* | Blue Dasher | | | | ✓ | ✓ | ✓ | | ✓ | | | | |
| *Pantala flavescens* | Wandering Glider | | | | | ✓ | | | | | | | |
| *Sympetrum costiferum* | Safronwinged Meadowhawk | | | | ✓ | ✓ | | | | | | | |
| *Sympetrum internum* | Cherry-faced Meadowhawk | | | | ✓ | ✓ | | ✓ | | | | | |
| *Sympetrum rubicundulum* | Ruby Meadowhawk | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | |
| *Sympetrum semicinctum* | Band-winged Meadowhawk | | | | | | ✓ | ✓ | | | | | |
| *Tramea carolina* | Carolina Saddlebags | | | | | ✓ | | | | | | | |
| *Tramea lacerata* | Black Saddlebags | | | | ✓ | ✓ | | | | | | | |
| **FISH** | | | | | | | | | | | | | |
| *[Rhinichthys atratulus]* | [Eastern Blacknose Dace] | | | | | | ✓ | | | | | | |
| *Lepomis cyanellus* | Green Sunfish | | | | ✓ | | ✓ | | | ✓ | | | |
| *Lepomis gibbosus* | Pumpkinseed | | | | | | ✓ | | | | | | |
| *Lepomis macrochirus* | Bluegill | | | | ✓ | | | | | | | | |
| *Notropis* sp. | Shiner sp. | | | | ✓ | ✓ | ✓ | | | | | | |
| **AMPHIBIANS and REPTILES** | | | | | | | | | | | | | |
| *Ambystoma maculatum* | Spotted Salamander | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Bufo a. americanus* | Eastern American Toad | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| *Chelydra s. serpentina* | Common Snapping Turtle | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | | |
| *Chrysemys p. picta* | Eastern Painted Turtle | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |
| *Clemmys guttata* | Spotted Turtle | | | | ✓ | ✓ | | | | | | ✓ | |
| *Elaphe o. obsoleta* | Black Rat Snake | | | | | ✓ | ✓ | | | | | | |
| *Hyla c. crucifer* | Northern Spring Peeper | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |

Table 4. 2017Wildlife Observations
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | Wetland Mitigation Area | | | | | | | | Other Area | | | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | A | A1 | C1 | C3 | C South | C North | C West | VPB | C | F/F1 | VP7 | HEEP |
| **AMPHIBIANS and REPTILES (cont.)** | | | | | | | | | | | | | |
| *Hyla versicolor* | Gray Treefrog | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Nerodia s. sipedon* | Northern Water Snake | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | | | |
| *Notophthalmus v. viridescens* | Red-spotted Newt | | | | ✓ | | | | ✓ | ✓ | | | |
| *Plethodon cinereus* | Redback Salamander | | ✓ | | | | ✓ | | | | ✓ | | ✓ |
| *Rana catesbeiana* | Bullfrog | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| *Rana clamitans melanota* | Green Frog | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Rana palustris* | Pickerel Frog | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| *Rana sylvatica* | Wood Frog | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| *Thamnophis s. sauritus* | Eastern Ribbon Snake | ✓* | | | | | | | | ✓* | | | |
| *Thamnophis s. sirtalis* | Eastern Garter Snake | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | | | ✓ |
| **BIRDS** | | | | | | | | | | | | | |
| *Accipiter cooperii* | Cooper's Hawk | | | | ✓ | | | | | | | | ✓ |
| *Actitis macularia* | Spotted Sandpiper | | | | ✓ | ✓ | | | | | | | |
| *Agelaius phoeniceus* | Red-winged Blackbird | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Aix sponsa* | Wood Duck | | | | | | ✓ | | | ✓ | | | ✓ |
| *Anas americana* | American Wigeon | ✓* | | | | | | | | ✓* | | | |
| *Anas platyrhynchos* | Mallard | ✓* | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Anas rubripes* | American Black Duck | | | | | | | | | ✓ | | | |
| *Archilochus colubris* | Ruby-throated Hummingbird | | | ✓ | ✓ | | ✓ | ✓ | | | | | |
| *Ardea herodias* | Great Blue Heron | | ✓ | | ✓ | ✓ | ✓ | | | ✓ | | | |
| *Bombycilla cedrorum* | Cedar Waxwing | | | | ✓ | | | ✓ | | ✓ | | | ✓ |
| *Branta canadensis* | Canada Goose | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Bubo virginianus* | Great Horned Owl | | | | | | ✓ | ✓ | | ✓ | | | |
| *Buteo jamaicensis* | Red-tailed Hawk | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Buteo lagopus* | Rough-legged Hawk | | | | ✓ | | | | | | | | ✓ |
| *Buteo lineatus* | Red-shouldered Hawk | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Buteo platypterus* | Broad-winged Hawk | | | | | | | ✓ | | ✓ | | | |
| *Butorides virescens* | Green Heron | | | | | | | | | ✓ | | | ✓ |
| *Cardinalis cardinalis* | Northern Cardinal | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Carduelis tristis* | American Goldfinch | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Carduelis pinus* | Pine Siskin | | | | | | ✓ | | | ✓ | | | |
| *Carpodacus mexicanus* | House Finch | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Cathartes aura* | Turkey Vulture | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Catharus guttatus* | Hermit Thrush | | | | | | ✓ | | | | | | ✓ |
| *Certhia americana* | Brown Creeper | ✓* | | | ✓ | | | | | ✓* | | | ✓ |
| *Chaetura pelagica* | Chimney Swift | | | | ✓ | ✓ | ✓ | ✓ | | | | | |
| *Charadrius vociferus* | Killdeer | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Coccyzus americanus* | Yellow-billed Cuckoo | | | ✓ | | | | ✓ | | | | | ✓ |
| *Colaptes auratus* | Northern Flicker | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| *Columba livia* | Rock Dove (Pigeon) | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Contopus virens* | Eastern Wood-Pewee | ✓ | ✓ | | | | ✓ | | | | | | ✓ |
| *Corvus brachyrhynchos* | American Crow | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Corvus ossifragus* | Fish Crow | | | | ✓ | | ✓ | | | ✓ | | | ✓ |
| *Cyanocitta cristata* | Blue Jay | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Cygnus olor* | Mute Swan | ✓* | | | | | | ✓ | | ✓* | | | |
| *Dendroica* sp. | Warbler species | | | | ✓ | ✓ | ✓ | | | | | | |
| *Dendroica coronata* | Yellow-rumped Warbler | ✓ | | | | ✓ | | | | ✓* | | | ✓ |
| *Dendroica petechia* | Yellow Warbler | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Dendroica pinus* | Pine Warbler | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Dendroica virens* | Black-throated Green Warbler | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Dryocopus pileatus* | Pileated Woodpecker | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Dumetella carolinensis* | Gray Catbird | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Empidonax* sp. | Flycatcher | | | | | | | ✓ | | | | | |
| *Empidonax traillii* | Willow Flycatcher | | | | ✓ | | | | | | | | ✓ |
| *Euphagus carolinus* | Rusty Blackbird | | | | | | ✓ | ✓ | | ✓ | | | ✓ |
| *Falco sparverius* | American Kestral | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |

Table 4. 2017Wildlife Observations
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| Scientific Name | Common Name | Wetland Mitigation Area | | | | | | | | Other Area | | | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | A1 | C1 | C3 | C South | C North | C West | VPB | C | F/F1 | VP7 | HEEP |
| **BIRDS (continued)** | | | | | | | | | | | | | |
| *Geothlypis trichas* | Common Yellowthroat | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Haliaeetus leucocephalus* | Bald Eagle | | | | | | | | | | | | ✓ |
| *Helmitheros vermivorus* | Worm-eating Warbler | | | | | ✓ | | | | | | | ✓ |
| *Hirundo rustica* | Barn Swallow | | | | ✓ | ✓ | ✓ | ✓ | | | | | ✓ |
| *Hylocichla mustelina* | Wood Thrush | ✓ | ✓ | | ✓ | ✓ | | | | | | | ✓ |
| *Icerus galbula* | Northern Oriole | | | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Junco hyemalis* | Dark-eyed Junco | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Larus argentatus* | Herring Gull | | | | | | | | | | | | ✓ |
| *Larus delawarensis* | Ring-billed Gull | | | | ✓ | | | ✓ | | ✓ | | | ✓ |
| *Megaceryle alcyon* | Belted Kingfisher | | | | | | | | | ✓ | | | ✓ |
| *Melanerpes carolinus* | Red-bellied Woodpecker | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Meleagris gallopavo* | Wild Turkey | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Melospiza georgiana* | Swamp Sparrow | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Melospiza lincolniielodia* | Lincoln's Sparrow | | | | | | | ✓ | | ✓ | | | |
| *Melospiza melodia* | Song Sparrow | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Mimus polyglottos* | Northern Mockingbird | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |
| *Mniotilta varia* | Black and White Warbler | | | | | | | | | | | | ✓ |
| *Molothrus ater* | Brown-headed Cowbird | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Myiarchus crinitus* | Great Crested Flycatcher | | | | ✓ | | ✓ | ✓ | | | | | ✓ |
| *Pandion haliaetus* | Osprey | ✓* | | | | | | | | ✓ | | | ✓ |
| *Parus atricapillus* | Black-capped Chickadee | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Parus bicolor* | Tufted Titmouse | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Passer domesticus* | House Sparrow | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Passerculus sandwichensis* | Savannah Sparrow | | | | | | | | | | | | ✓ |
| *Phalacrocorax auritus* | Double-crested Cormorant | | | | | | | ✓ | | ✓ | | | |
| *Phasianus colchicus* | Ring-necked Pheasant | | | | | | | | | ✓* | | | |
| *Pheucticus ludovicianus* | Rose-breasted Grosbeak | ✓* | | | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| *Picoides pubescens* | Downy Woodpecker | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Picoides villosuss* | Hairy Woodpecker | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Pipilo erythrophthalmus* | Rufous-sided Towhee | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Piranga olivacea* | Scarlet Tanager | ✓* | | | | | | | | ✓ | | | |
| *Polioptila caerulea* | Blue-grey Gnatcatcher | | | | ✓ | | ✓ | ✓ | | ✓ | | | |
| *Pooecetes gramineus* | Vesper Sparrow | ✓* | | | | | | | | ✓* | | | |
| *Progne subis* | Purple Martin | | | | | | | | | ✓* | | | |
| *Protonotaria citrea* | Prothonotary Warbler | | | | | | | | | ✓* | | | |
| *Quiscalus quiscula* | Common Grackle | | | | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Regulus calendula* | Ruby-crowned Kinglet | | | | ✓ | | ✓ | | | ✓ | | | ✓ |
| *Regulus satrapa* | Golden-crowned Kinglet | | | | | | ✓ | | | ✓ | | | ✓ |
| *Riparia riparia* | Bank Swallow | | | | | | ✓ | ✓ | | ✓ | | | |
| *Sayornis phoebe* | Eastern Phoebe | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Scolopax minor* | American Woodcock | | | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| *Seiurus aurocapilla* | Ovenbird | | | | ✓ | | | | | | | | |
| *Seiurus noveboracensis* | Northern Waterthrush | | | | | | | ✓ | | ✓ | | | |
| *Seiurus motacilla* | Louisiana Waterthrush | | | | ✓ | | | | | | | | |
| *Setophaga ruticilla* | American Redstart | ✓* | | | | | | | | | | | |
| *Sialia sialis* | Eastern Bluebird | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Sitta carolinensis* | White-breasted Nuthatch | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Spizella arborea* | American Tree Sparrow | | | | | | | ✓ | | ✓ | | | ✓ |
| *Spizella passerina* | Chipping Sparrow | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Spizella pusilla* | Field Sparrow | | | | | | ✓ | | | ✓ | | | |
| *Strix varia* | Barred Owl | | | | | | | | | ✓* | | | ✓ |
| *Stelgidopteryx serripennis* | Northern Rough-winged Swallow | | | | | | | | | | | | ✓ |
| *Sturnella magna* | Eastern Meadowlark | | | | | | | | | ✓* | | | |
| *Sturnus vulgaris* | European Starling | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Tachycineta bicolor* | Tree Swallow | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Thryothorus ludovicianus* | Carolina Wren | | | | ✓ | | | | | ✓ | | | ✓ |
| *Toxostoma rufum* | Brown Thrasher | | | | ✓ | | | | | | | | |
| *Troglodytes aedon* | House Wren | | | | ✓ | ✓ | ✓ | ✓ | | | | | ✓ |

Table 4. 2017Wildlife Observations
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| | | Wetland Mitigation Area | | | | | | | | Other Area | | | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scientific Name | Common Name | A | A1 | C1 | C3 | C South | C North | C West | VPB | C | F/F1 | VP7 | HEEP |
| **BIRDS (continued)** | | | | | | | | | | | | | |
| *Troglodytes troglodytes* | Winter Wren | | | | | | | | | | | | ✓ |
| *Turdus migratorius* | American Robin | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Tyrannus tyrannus* | Eastern Kingbird | | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | |
| *Vireo flavifrons* | Yellow-throated Vireo | ✓ | ✓ | | | | ✓ | | | | | | ✓ |
| *Vireo gilvus* | Warbling Vireo | | | | | | ✓ | | | | | | |
| *Vireo olivaceus* | Red-eyed Vireo | ✓ | ✓ | | | | | | | | | | ✓ |
| *Zenaida macroura* | Mourning Dove | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ |
| *Zonorichia albicollis* | White-throated Sparrow | | | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | ✓ |
| **MAMMALS** | | | | | | | | | | | | | |
| *Canis latrans* | Coyote | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| *Castor canadensis* | Beaver | | | | | ✓* | ✓* | | | ✓ | | | |
| *Condylura cristata* | Star Nose Mole | | | | | | | | | | ✓ | | |
| *Didelphis virginiana* | Virginia Opossum | ✓ | | | | | | | | | | | |
| *Eptesicus fuscus* | Big Brown Bat | ✓* | | | | | | | | | | | |
| *Glaucomys sabrinus* | Northern Flying Squirrel | ✓* | | | | | | | | | | | |
| *Lynx rufus* | Bobcat | | | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | |
| *Marmota monax* | Woodchuck | ✓ | ✓ | | | ✓ | | | | | ✓ | | |
| *Martes pennanti* | Fisher | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | |
| *Mephitis mephitis* | Striped Skunk | ✓ | | | ✓ | | | | | ✓ | | | ✓ |
| *Microtus pennsylvanicus* | Meadow Vole | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ |
| *Mustela erminea* | Short-tailed Weasel | | | | ✓ | | | | | | | | ✓ |
| *Mustela frenata* | Long-tailed Weasel | | | | | | ✓ | | | ✓ | | | ✓ |
| *Odocoileus virginianus* | White-tailed Deer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Ondatra zibethicus* | Common Muskrat | ✓ | ✓ | | | | | ✓ | | ✓ | | | ✓ |
| *Peromyscus leucopus* | White-footed Mouse | ✓ | ✓ | | | | | ✓ | | | | | |
| *Procyon lotor* | Racoon | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| *Sciurus carolinensis* | Gray Squirrel | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| *Sorex palustris* | Water Shrew | | | | | | ✓ | | | ✓* | | | |
| *Sylvilagus floridanus* | Eastern Cottontail | ✓ | ✓ | | ✓ | ✓ | | ✓ | | | | | |
| *Tamias striatus* | Eastern Chipmunk | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| *Tamiasciurus hudsonicus* | Red Squirrel | | | | ✓ | | | ✓ | | ✓ | ✓ | | |
| *Urocyon cinereoargenteus* | Gray Fox | | | | | | ✓ | | | ✓ | | | ✓ |
| *Vulpes vulpes* | Red Fox | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |

✓ Animals Observed 2017 by M&A.
✓ Birds Observed 2015 - 2017 from ebird.org/ebird/hotspots (accessed 12/19/2017)*
✓ Animals Observed 2006 - 2014.
✓* Animals Observed / Reported Prior to the Beginning of Construction in 2006.

*ebird Hotspots are:
HEEP (data from this set entered under HEEP)
Platform South (data from this set entered under C West and C)
Platform North (data from this set entered under C North and C)
Rockhill (data entered from this set entered under C3)
Bike Trail (data entered from this set entered under C West)

Table 5. April-May 2017 Pool Survey (4/28/17, 5/8/17 & 5/16/17)
Uconn Wetland Mitigation Plan Implementation
Remedial Action Plan for Landfill and Former Chemical Pits

| Area | Pool Number | Depth Range* | Isolated | Fish | Amphibian | | | Notes / Species | Estimated Depth (Ft.) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Eggs | Tadpoles | Frogs | | |
| A1 | 1 | shallow | | | | | | no activity | 0.68' |
| A | 1 | shallow | | | | | | no activity | 0.50' |
| A | 2 | shallow | | | | | ✓ | | 0.50' |
| B | 1 | dry | ✓ | | | | | no activity | dry |
| C | 1 | deep | | ✓ | ✓ | | ✓ | eggs observed in April | 3.0' |
| C1 | 1 | shallow | ✓ | | | | | no activity | 0.50' |
| C3 | 1 | shallow | ✓ | | | | | | 1.5' |
| C3 | 2 | shallow | | | | | | thick organic debris | 0.50' |
| C3 | 3 | deep | | | | | | thick organic debris | 1.0' |
| C3 | 4 | shallow | | | | | | | 1.0' |
| C3 | 5 | v. deep | | ✓ | | | | water strider, snapping turtle | 3.0' |
| CN | 1 | deep | | | | | | no activity | 2.5' |
| CN | 2 | shallow | | | | | | no activity | 1.0' |
| CN | 3 | deep | | | | | | adult green frog; cattail dominant | 1.2' |
| CN | 4 | v. deep | | ✓ | | | | | 3.3' |
| CN | 5 | deep | | | | | ✓ | | 3.0' |
| CN | 6 | shallow | | | | | | filling in with cattail | 3.0' |
| CN | 7 | shallow | | | | | | filling in with cattail | 1.5' |
| CN | 8 | shallow | | | | | | no activity | 1.5' |
| CN | 9 | deep | | | | | ✓ | | 2.0' |
| CN | 10 | shallow | | | | | | | 1.5' |
| CN | 11 | v. deep | | | | | ✓ | | 3.0' |
| CN | 12 | v. deep | | | | | | no activity | 3.0' |
| CN | 13 | shallow | | | | | ✓ | no activity | 1.0' |
| CN | 14 | deep | | | | | | garter snake | 2.3' |
| CN | 15 | v. deep | | | | ✓ | ✓ | large tadpoles | 3.0' |
| CN | 16 | shallow | | | | | | mucky | 1.0' |
| CN | 17 | shallow | | | | | | mucky | 0.7' |
| CN | 18 | shallow | | | | | | water strider | 1.7' |
| CS | 1 | shallow | | | ✓ | ✓ | ✓ | wood frog, green frog, painted turtle | 1.5' |
| CS | 2 | v. deep | | | | | ✓ | adult green frog, water strider, clear water | 3.0' |
| CS | 3 | deep | | | | | | thick organic debris | 2.0 |
| CS | 4 | v. deep | | | | | ✓ | organic debris | 2.5' |
| CS | 5 | deep | | | | ✓ | ✓ | water strider, clear water | 2.0' |
| CS | 6 | deep | ✓ | | | ✓ | | large tadpoles | 2.5' |
| CS | 7 | deep | | | | | | water strider; cattail mat forming | 2.0' |
| CS | 8 | v. deep | ✓ | | | | ✓ | | 1.0' |
| CS | 9 | deep | | | ✓ | ✓ | | 1 spotted salamander egg mass | 2.0' |
| CS | 10 | deep | | | | ✓ | | | 2.0' |
| CS | 11 | deep | | | | ✓ | | | 2.0' |
| CS | 12 | shallow | ✓ | | ✓ | | ✓ | spotted salamander eggs; adult green frog | 0.68' |
| CS | 13 | shallow | | | | | | no activity | 0.80' |
| CW | 1 | deep | | | | ✓ | ✓ | cattail mat forming | 2.0' |
| CW | 2 | v. deep | | | | | ✓ | | 3.0' |
| CW | 3 | deep | | | | | ✓ | green frogs | 2.0' |
| CW | 4 | shallow | | | | | | no activity | 1.0' |
| CW | 5 | shallow | | | | | | high iron | 1.0' |
| CW | 6 | deep | | | ✓ | | | wood frog eggs | 2.0' |
| CW | 7 | v. deep | | | ✓ | ✓ | ✓ | adult green frog, spotted salamander, mosquito | 3' |
| F | 1 | shallow | ✓ | | | ✓ | | mosquito; outlet flowing | 0.65' |

* Approximate Depth: Shallow = <2', Deep = 2'-3', Very Deep = >3'

Table 5. April-May 2017 Pool Survey (4/28/17, 5/8/17 & 5/16/17)
Uconn Wetland Mitigation Plan Implementation
Remedial Action Plan for Landfill and Former Chemical Pits

| Area | Pool Number | Depth Range* | Isolated | Fish | Amphibian | | | Notes / Species | Estimated Depth (Ft.) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Eggs | Tadpoles | Frogs | | |
| | **South Basin** | deep | ✓ | | | | ✓ | green frog calling | 2.0 |
| | **South Forebay** | shallow | ✓ | | | | | algae on surface | 1.5' |
| | **North Basin** | v. deep | ✓ | | | | | iron rich water; cattail mat forming | 2.0' |
| | **North Forebay** | v. deep | ✓ | | | | | cattail mat forming | 2.0' |
| | **Plunge Pool** | deep | ✓ | | | | | high adult mosquito population | 2.0' |
| | **VP B** | deep | ✓ | | ✓ | ✓ | ✓ | wood frog tadp., spot. salamander eggs, green frog | 2.5' |
| | **VP 1** | shallow | | | | | | not surveyed | |
| | **VP 2** | shallow | | | | | | not surveyed | |
| | **VP 3** | shallow | ✓ | | | | | no activity | 0.85' |
| | **VP 4** | shallow | ✓ | | | ✓ | ✓ | adult green frog | 0.78' |
| | **VP 5** | shallow | ✓ | | | ✓ | ✓ | | 0.50' |
| | **VP 6** | shallow | ✓ | | | | | drawing down | <0.50' |
| | **VP 7** | shallow | ✓ | | | | ✓ | adult green frog | 1.0" |
| | **VP 7A** | shallow | ✓ | | | | | drawing down | <1.0' |
| | **VP 8** | deep | ✓ | | | ✓ | ✓ | | |
| | **VP 9A** | deep | ✓ | | | ✓ | | fairy shrimp | >2.0' |
| | **VP 9B1** | shallow | ✓ | | | ✓ | ✓ | wood frog; tadpoles | 2.0' |
| | **VP 9B2** | shallow | ✓ | | | ✓ | ✓ | algae, wood frog, phragmites | 1.0' |
| | **VP 9C** | shallow | ✓ | | | | | no activity | 1.0' |
| | **VP 10** | shallow | ✓ | | | ✓ | | | 1.0' |
| | **VP 10A** | shallow | ✓ | | | | | no activity | 0.5' |
| | **VP 11** | shallow | ✓ | | | | | dry | n/a |
| | **VP 12** | shallow | ✓ | | | | ✓ | 1 adult green frog | 1.0' |
| | **VP 13** | shallow | ✓ | | | | ✓ | mayfly larvae, green frog | 0.5' |

* Approximate Depth: Shallow = <2', Deep = 2'-3', Very Deep = >3'

# APPENDIX A - Wetland Creation and Restoration Area Photographs

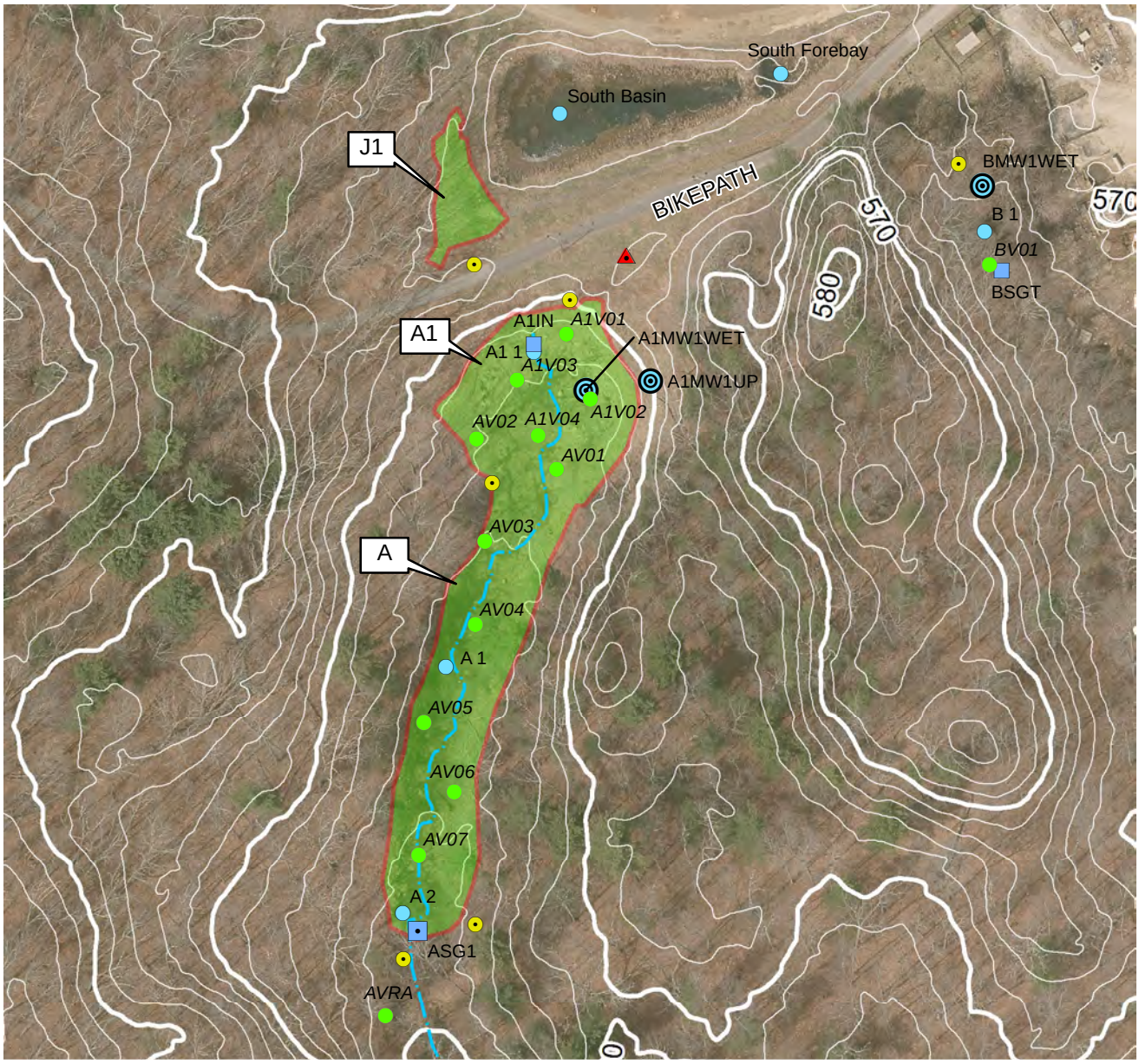
# APPENDIX B - Wetland Area Estimates & Maps

Appendix B Wetland Area Estimates
Wetland Mitigation Monitoring Report 10 - 2017
Landfill Closure Project #900748, University of Connecticut, Storrs

| Wetland Mitigation | | NWI | 2017 Wetland Delineation | | |
|---|---|---|---|---|---|
| Type | Site Name | Wetland Type* | Sq. Ft. | Acres | Comments |
| Wetland Restoration | | | | | |
| | A | PFO, PSS (PEM) | 16,570 | | Designed |
| | C North | PEM, PSS (PFO) | 53,541 | | Designed |
| | C South | PEM, PSS (PFO) | 36,260 | | Designed |
| | C West | PEM, PSS (PFO) | 31,926 | | Designed |
| | D | PEM | 1,717 | | Stormwater Discharge |
| | F | PEM (PSS) | 1,035 | | Stormwater Discharge |
| | J | PEM | 15 | | Shallow Depression |
| | | | 141,063 | 3.24 | |
| Wetland Creation | | | | | |
| | A1 | PEM (PSS, PFO) | 7,114 | | Designed for Succession to PFO |
| | C South | PEM, PSS (PFO) | 790 | | Incidental to Final Grading |
| | C1 | PFO, PSS | 6,321 | | Designed for Successional Growth |
| | C3 | PEM, PSS (PFO) | 71,073 | | Designed for Successional Growth |
| | D1 | PEM | 233 | | Natural Drainage & Stormwater Discharge |
| | F1 | PEM (PSS) | 5,321 | | Natural Drainage & Stormwater Discharge |
| | J1 | PEM | 2,142 | | Shallow Depression Periodically Mowed |
| | VPB | PEM | 1,722 | | Designed Seasonal Pool Vegetated in Summer-Fall |
| | | | 94,715 | 2.17 | |
| Wetland Loss | | | | | |
| | A | PFO, PSS | 1,573 | | Rerouted Stormwater Discharge to Basin |
| | B | PEM | 6,455 | | Bikepath Relocation, Drainage Modification |
| | C East (E of C3) | PSS | 1,438 | | Drainage Modification |
| | C North | PSS, PEM | 899 | | Incidental to Final Grading |
| | C South | PSS, PEM | 6,497 | | Fill for Landfill Remediation |
| | C West | PSS, PEM | 29,518 | | N. Stormwater Basin, Drainage Modification |
| | D | PFO, PEM | 28,463 | | Fill for Landfill Remediation, Drainage Modification |
| | F | PFO,PSS | 2,363 | | Fill for Landfill Remediation, Drainage Modification |
| | I | PEM | 1,500 | | Fill for Landfill Remediation |
| | J | PEM | 8,637 | | S. Stormwater Basin, Drainage Modification |
| | | | 87,345 | 2.01 | |

* National Wetland Inventory Classification of Wetland Types:
PFO = palustrine forested (e.g. wooded swamp)
PSS = palustrine shrub /scrub (e.g. shrub swamp)
PEM = palustrine emergent (e.g. wet meadow and marsh)

Types in (parentheses) indicate minor component.
Riverine and Palustrine Unconsolidated Bottom NWI types also present.




**Approximate Location:**

HEEP Boundary
Wetland Mitigation
Other Wetlands

**Topogrpahic Contour**

580 Contour & Elev.

Streams
Benchmark
Well
Staff Gauge
Other Water Level

Amphibian Pools
PhotoStations
Veg. Transects
Veg. Plots

N

0 100 Feet
Approximate Scale

Source: 2016 Aerial Photo & Topographic Contours CTECO Elev. in Feet

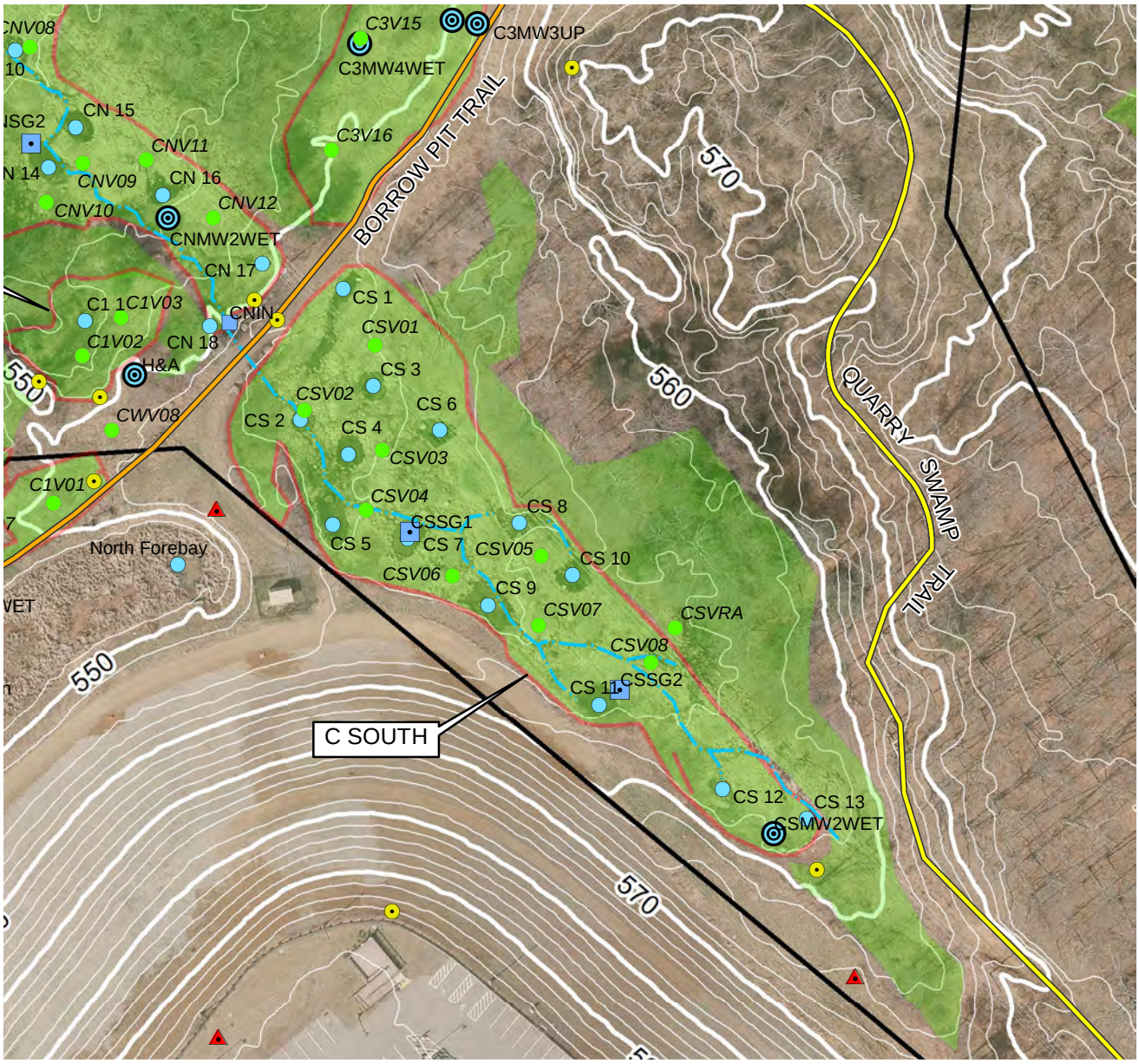
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# WETLAND AREAS A, A1 & J1

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Mason & Associates No. 140101

Detail Map 1




**Approximate Location:**

- HEEP Boundary
- Wetland Mitigation
- Other Wetlands
- Streams
- Benchmark
- Well
- Staff Gauge
- Other Water Level
- Amphibian Pools
- PhotoStations
- Veg. Transects
- Veg. Plots

**Topogrpahic Contour**

580 Contour & Elev.

N

0 100 Feet

Approximate Scale

Source: 2016 Aerial Photo & Topographic Contours CTECO Elev. in Feet

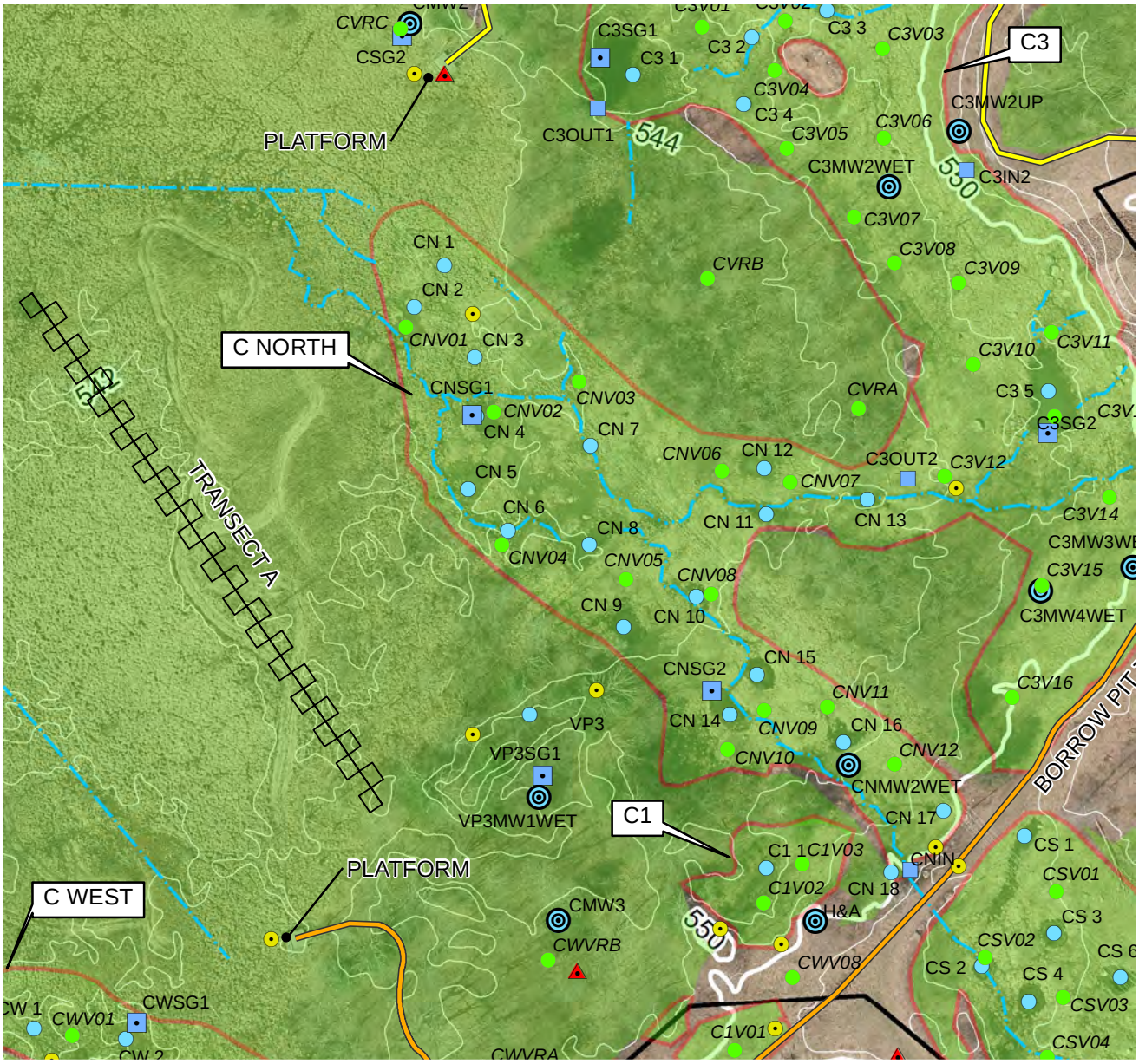
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# WETLAND AREA C SOUTH

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Mason & Associates No. 140101

Detail Map 2




**Approximate Location:**

- HEEP Boundary
- Streams
- Amphibian Pools
- Wetland Mitigation
- Benchmark
- PhotoStations
- Other Wetlands
- Well
- Veg. Transects
- Staff Gauge
- Veg. Plots

**Topogrpahic Contour**

580 Contour & Elev.

Other Water Level

N

0 100 Feet

Approximate Scale

Source: 2016 Aerial Photo & Topographic Contours CTECO Elev. in Feet

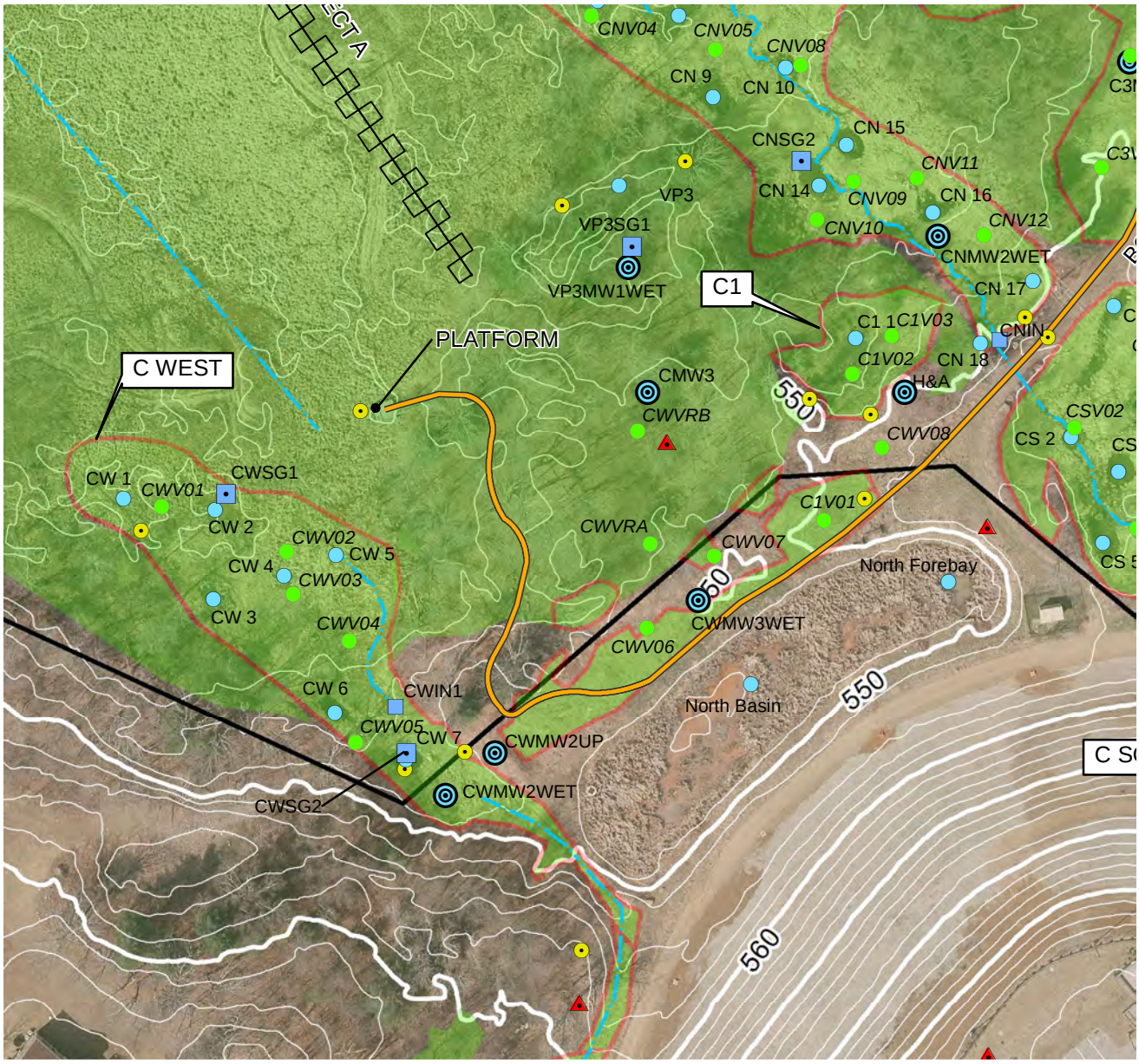
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# WETLAND AREAS C NORTH & C1

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Mason & Associates No. 140101

Detail Map 3




**Approximate Location:**

HEEP Boundary
Streams
Amphibian Pools
Wetland Mitigation
Benchmark
PhotoStations
Other Wetlands
Well
Veg. Transects
**Topogrpahic Contour**
Staff Gauge
Veg. Plots
580 Contour & Elev.
Other Water Level

N

0 100 Feet
Approximate Scale

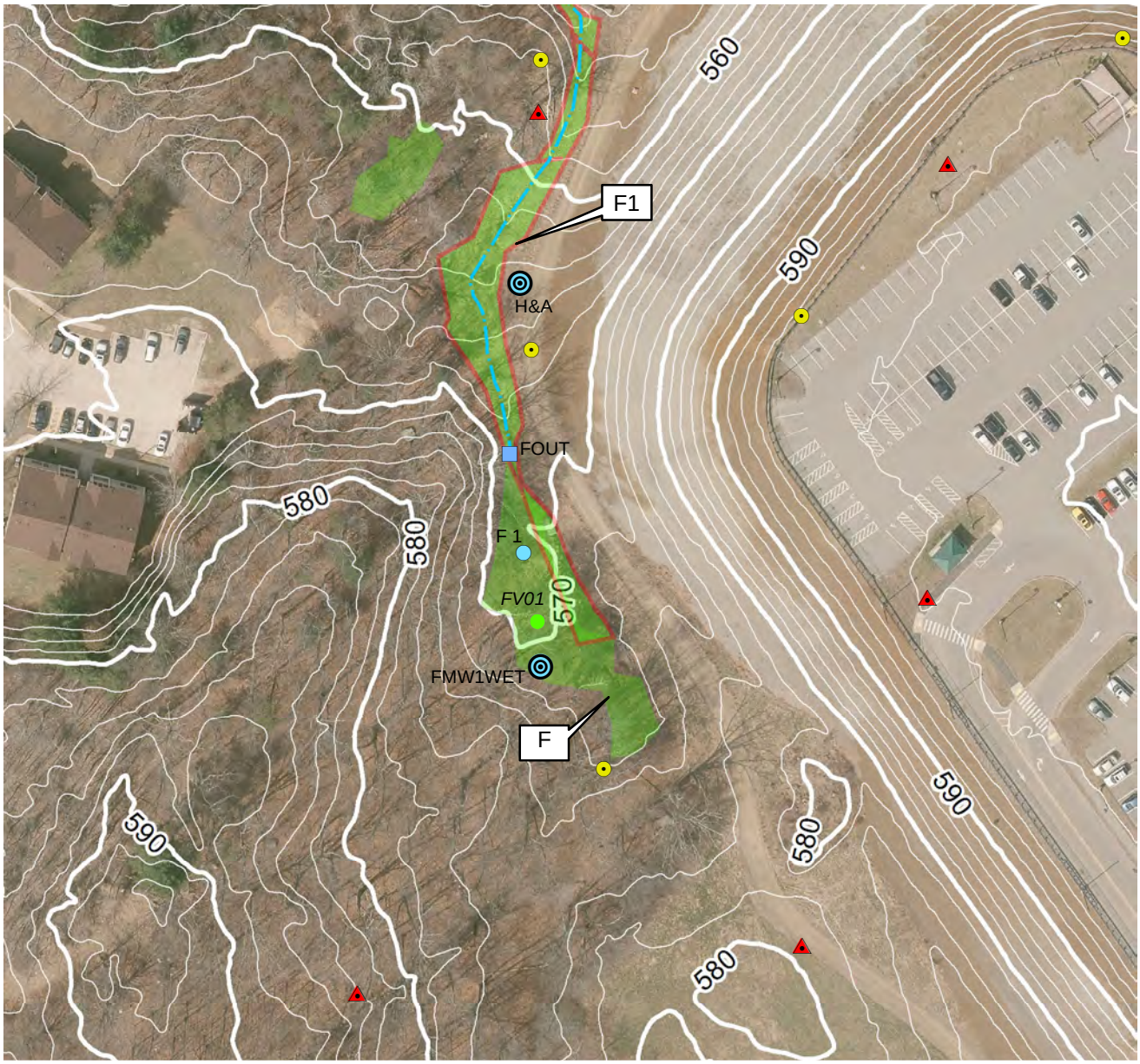
Source: 2016 Aerial Photo & Topographic Contours CTECO Elev. in Feet

Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# WETLAND AREA C WEST

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Mason & Associates No. 140101 | Detail Map 4




**Approximate Location:**

HEEP Boundary
Wetland Mitigation
Other Wetlands

**Topogrpahic Contour**

580 Contour & Elev.

Streams
Benchmark
Well
Staff Gauge
Other Water Level

Amphibian Pools
PhotoStations
Veg. Transects
Veg. Plots

N

0 100 Feet

Approximate Scale

Source: 2016 Aerial Photo & Topographic Contours CTECO Elev. in Feet

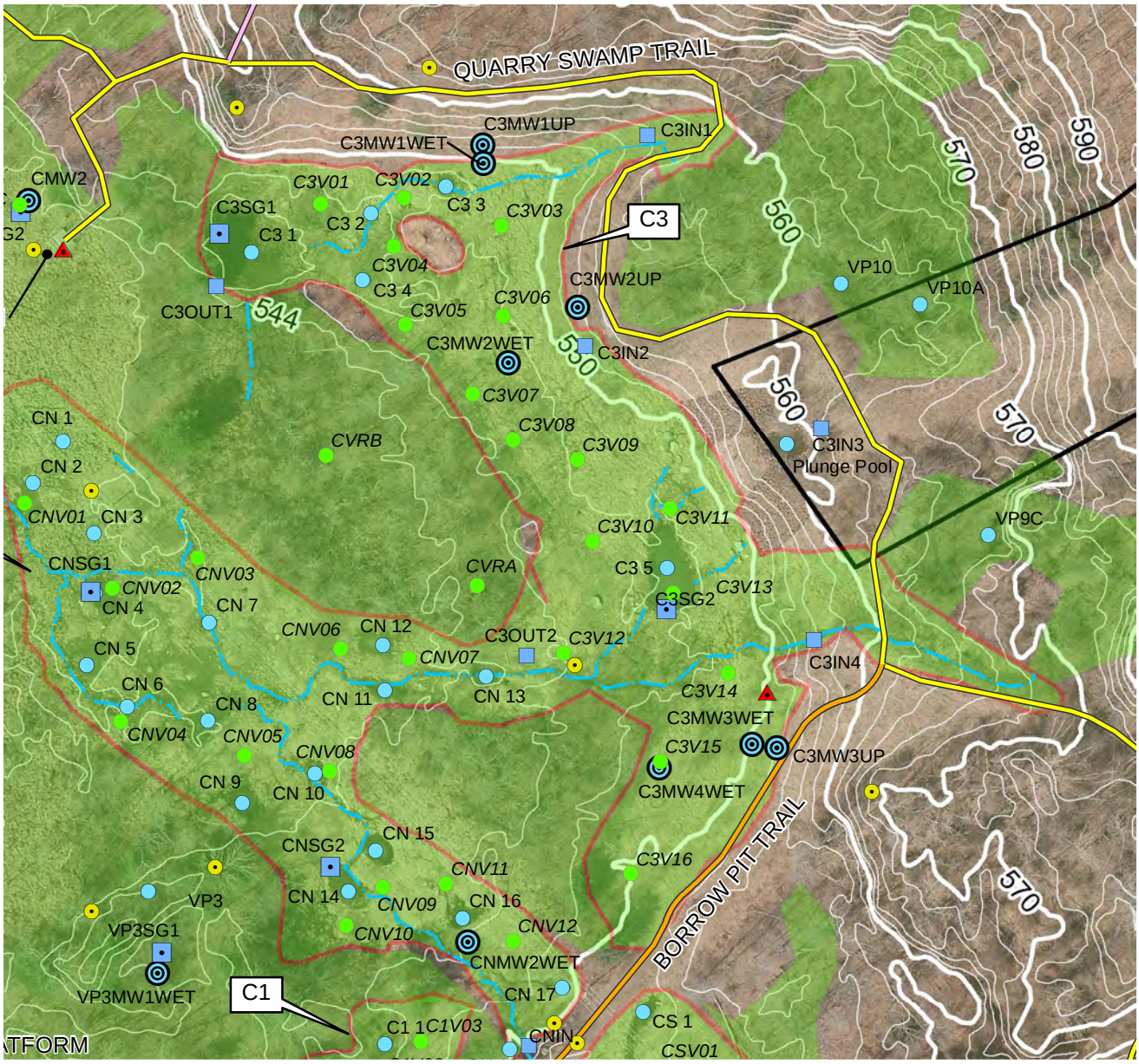
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# WETLAND AREAS F & F1

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Mason & Associates No. 140101

Detail Map 5




**Approximate Location:**

HEEP Boundary
Wetland Mitigation
Other Wetlands

**Topogrpahic Contour**

580 Contour & Elev.

Streams
Benchmark
Well
Staff Gauge
Other Water Level

Amphibian Pools
PhotoStations
Veg. Transects
Veg. Plots

N

0 100 Feet
Approximate Scale

Source: 2016 Aerial Photo & Topographic Contours CTECO Elev. in Feet

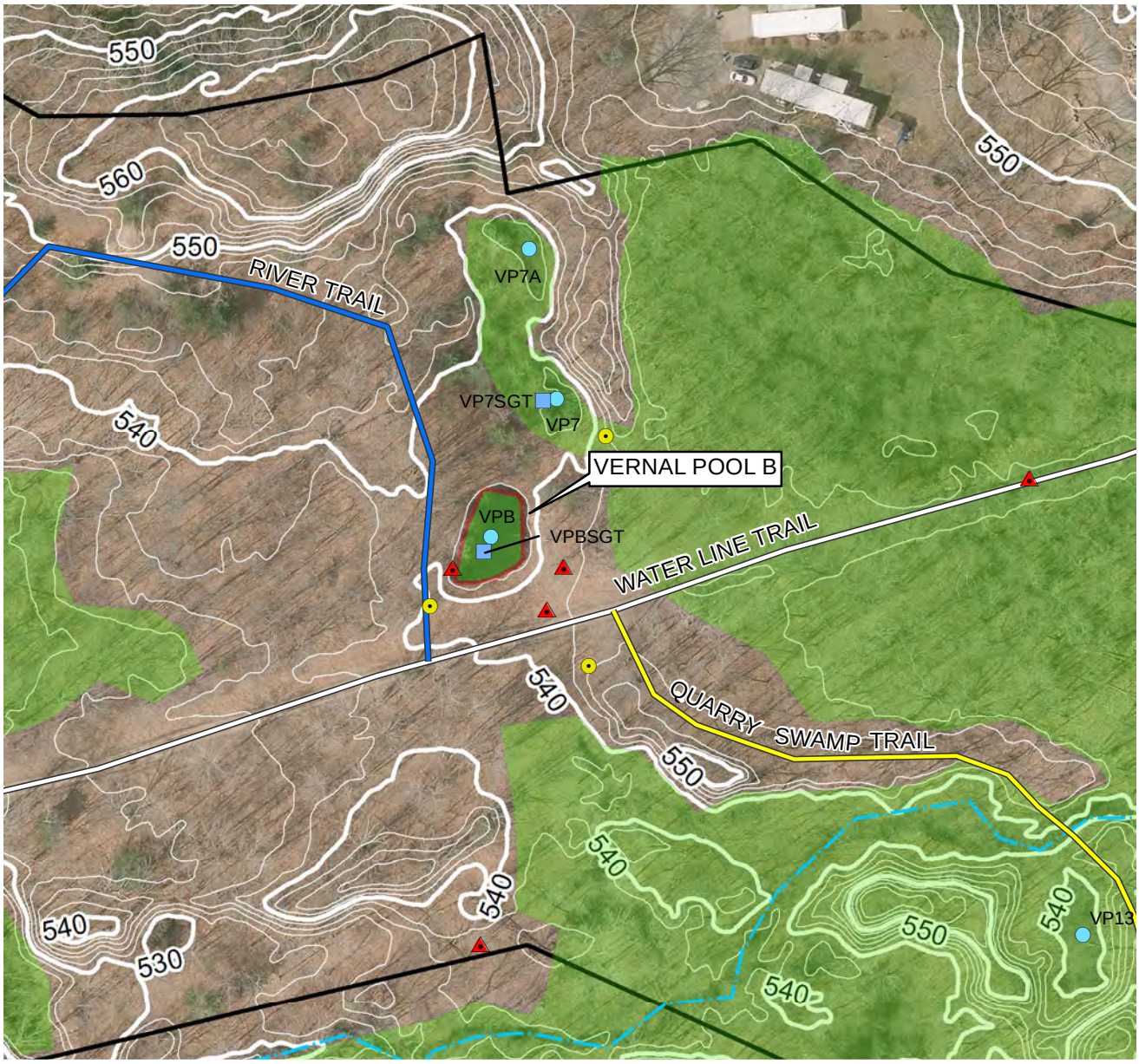
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# WETLAND AREA C3

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Mason & Associates No. 140101

Detail Map 6




**Approximate Location:**

- HEEP Boundary
- Wetland Mitigation
- Other Wetlands

**Topogrpahic Contour**

- 580 Contour & Elev.

- Streams
- Benchmark
- Well
- Staff Gauge
- Other Water Level

- Amphibian Pools
- PhotoStations
- Veg. Transects
- Veg. Plots

N

0 100 Feet

Approximate Scale

Source: 2016 Aerial Photo & Topographic Contours CTECO Elev. in Feet

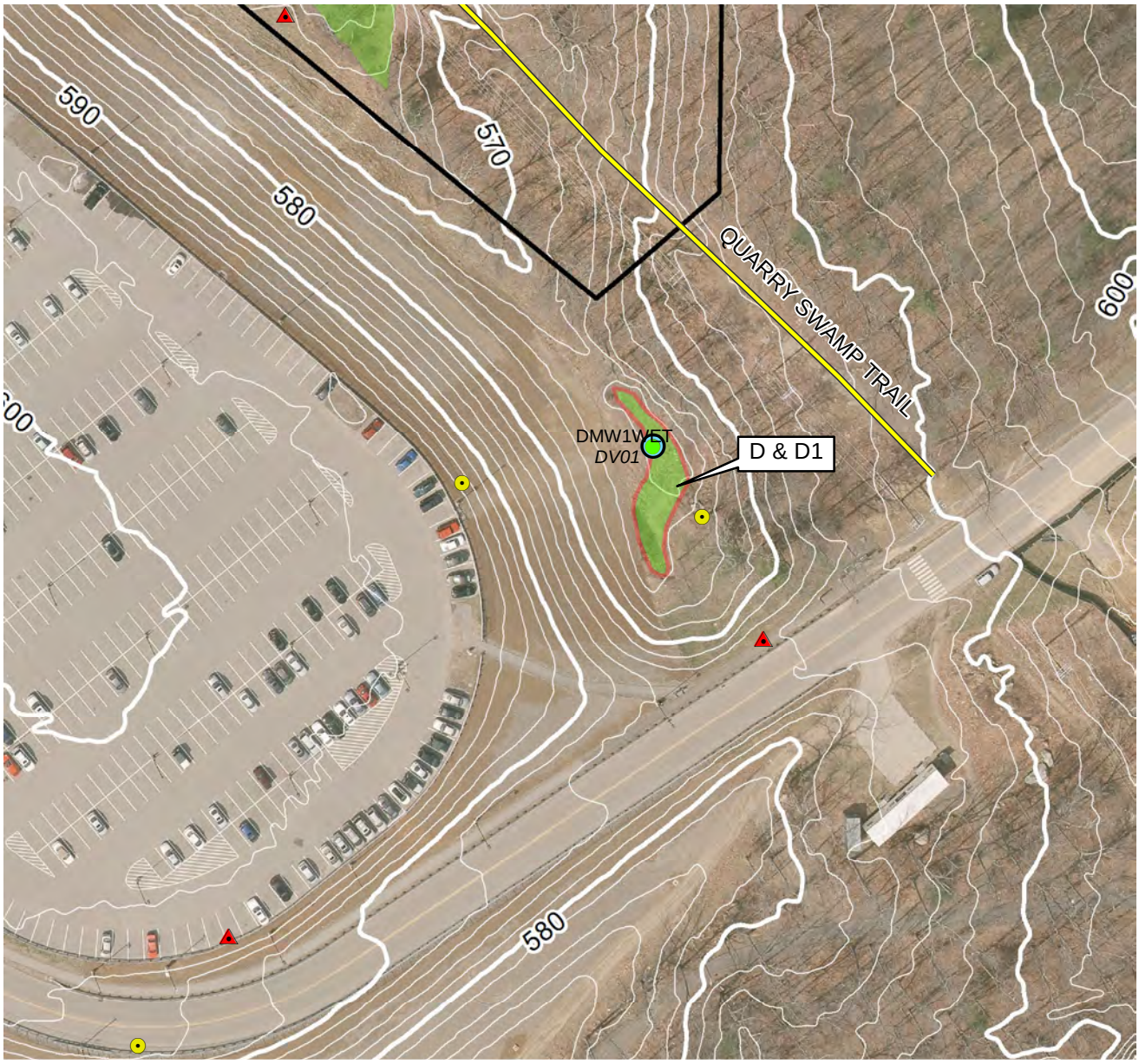
Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# VERNAL POOL B

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Mason & Associates No. 140101

Detail Map 7




**Approximate Location:**

- HEEP Boundary
- Wetland Mitigation
- Other Wetlands
- Streams
- Benchmark
- Well
- Staff Gauge
- Other Water Level
- Amphibian Pools
- PhotoStations
- Veg. Transects
- Veg. Plots

**Topogrpahic Contour**

580 Contour & Elev.

N

0 100 Feet

Approximate Scale

Source: 2016 Aerial Photo & Topographic Contours CTECO Elev. in Feet

Wetland Mitigation Plan Implementation
University of Connecticut, Storrs, CT

# WETLAND AREA D

MASON & ASSOCIATES, INC.
*Environmental Consulting & Projects*
771 Plainfield Pike, North Scituate, Rhode Island 02857

Mason & Associates No. 140101

Detail Map 8