Draft Wetland Mitigation Plan

For

River Bend Golf Course – New Berlin, NY

The Wetland Trust Susquehanna Basin Headwaters In-Lieu Fee Program

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The Wetland Trust (TWT) is a 501(c) 3 non-profit land trust whose mission and vision is to protect wetlands of conservation significance. TWT operates an In-Lieu Fee Wetland Mitigation Program (Susquehanna Basin Headwaters ILF) that was designed with a scientifically-based approach for selecting sites to maximize wetland functions and values. TWT's ILF Program Instrument was approved in October 2014 and guides selection and development of ILF sites. TWT's ILF presently contains 5 Service Areas that cover five 8-digit Hydrologic Unit Areas (HUAs) in New York State. A Mitigation Plan for each ILF site will be submitted for Interagency Review Team (IRT) review and approval and public comment. Upper Susquehanna Coalition (USC) has been retained by TWT to develop a wetland mitigation plan for the Susquehanna River 8-digit HUA (0205101). A +/- 123.8 acre site known as the former Riverbend Golf Course located in the Town of New Berlin, Chenango County, New York (Figure 1) is proposed as the primary site for compensatory mitigation in this watershed. This plan will have the major elements required by 33CFR 332.4 that will specifically describe the nominated site. These elements are:

1. Introduction and Objectives

The primary goal of the Golf Course ILF mitigation site is to provide wetland reestablishment/ establishment, rehabilitation, and protection to compensate for watershed level wetland loss. More specifically this site provides an opportunity to:

- Reduce nutrient inputs and greenhouse emissions by cessation of fertilizer applications and intensive mowing regimes needed to maintain the site as a golf course
- Take advantage of the flat, gently undulating topography to re-establish a large contiguous floodplain wetland with multiple wetland cover-types and a diverse array of species adjacent to the Unadilla River;
- Provide improved/new habitat for wildlife – including threatened and endangered species found in the vicinity project site (northern long-eared bat, bald eagle)
- Reestablish a robust riparian buffer along the Unadilla River to provide stream stability;
- Provide flood attenuation by collecting and slowing waters;
- Provide an educational opportunity to a nearby school and surrounding universities; and
- Utilize an approved approach to financial assurances that maximizes wetland acres preserved.
- Potential to provide a new NY-DEC fishing access point

2. Site Selection

2.1 Site

This proposed ILF site – the former Riverbend Golf Course – is located on a mostly open 123.8 acre area along the banks of the Unadilla River in the Unadilla-Susquehanna Rivers 8-digit HUA (02040101) in the Town of New Berlin, Chenango County (43°34'24N, 75°20'04W). This site was selected because of its unique potential to reestablish a large, diverse floodplain wetland complex (≥40 acres), and the opportunity to substantially reduce nutrient loading to the Unadilla River. The site location is shown in Figures 1 and 2. Existing and proposed aquatic resources for the site are provided in Figure 3.

The Unadilla River floodplain contains several ecological communities of state-wide conservation significance (fens, rich hemlock and northern white cedar swamps) (NYNHP 2013, Edinger et al. 2014), suggesting restoration of the site will reduce landscape fragmentation and increase connectivity of unique plant and animal populations in the region. For instance – researchers and staff from SUNY (ESF, Buffalo, and Oneonta), the Cornell Ornithology Lab, and Upper Susquehanna Coalition have identified several species of conservation significance at the site including: bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), Northern long-eared bats (*Myotis septentrionalis*), and the uncommon plants meadow spikemoss (*Selaginella apoda*), butternut (*Juglans cineria*). Nearby tributaries also support brook trout (*Salvelinus frontinalis*), eastern hellbender (*Cryptobranchus alleghaniensis*), and several mussel species, which are likely beneficiaries of water quality improvements from this project. TWT will consult with the U.S. Fish and Wildlife Service, NY-DEC and other appropriate agencies in order to ensure the project has no adverse effects on endangered species documented in surrounding areas.

Due to the incidence of floodplain farming in the Unadilla River floodplain (63% *based on 2011 National Land Cover Dataset*), it is relatively uncommon to have the opportunity to re-establish such a large wetland complex (emergent, scrub-shrub, forested wetlands) at a single site in proximity to species of greatest conservation need in this Service Area. The large size of the parcel (123.8 acres) provides for better long-term sustainability, while permanently protecting the Unadilla River floodplain from development, erosion, sedimentation, and nutrient inputs. For

instance, TWT ownership of the property has resulted in a cessation of fertilizer inputs, reduction in greenhouse gas emissions from mowing cessation, and initiated the process of carbon accumulation from plant growth. Only 10.67 acres of existing wetlands remained on the property as of 2014 due to historic hydrologic modifications at the site. The site also has less than 10% existing forest cover, consisting of small isolated upland and wetland forests as depicted in Figure 3.

The Golf Course site is also situated adjacent to the Unadilla Valley Central School, which will provide an opportunity for outdoor classroom activities for students of all grade levels following site construction. TWT is also partnering with researchers from SUNY-ESF and SUNY-Morrisville on hellbender recovery initiatives in Service Area 1 and this site along with others protected by TWT may provide ideal opportunities for those efforts.

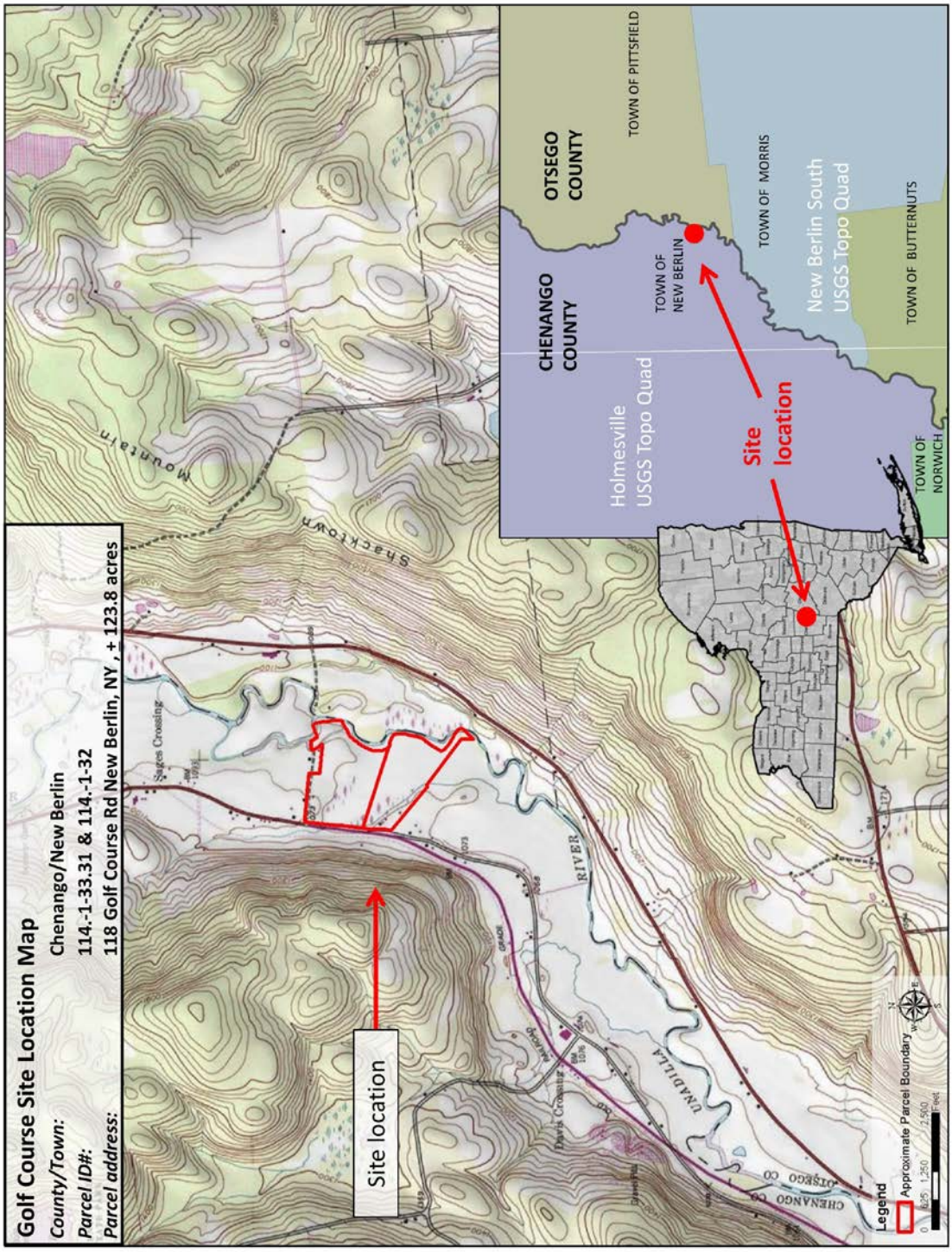

Figure 1 Site location

Approximate Coordinates Latitude: 42.577639 Longitude: -75.342543 (NAD 83). The site is accessed from Golf Course Rd, New Berlin, NY.

Figure 2 View of the ILF Site.
The Unadilla River lies along the eastern property boundary. Several golf greens can be seen throughout the property, with the large majority of the property maintained as open space. Several linear drain features can be seen crossing the property, and ultimately draining into the Unadilla River to the southern portion of the property.

3. Site Protection Instrument

The 123.8 acre ILF site is owned fee simple, by The Wetland Trust (TWT), 4729 State Route 414 Burdett, NY 14818, a 501(c) 3 Corporation whose mission is the protection, conservation and restoration of wetlands. TWT will be the permanent owner and land steward. A USACE approved third party conservation easement will be recorded, naming The Wetland Conservancy, P.O. Box 220, Burdett, NY 14818-0220, a 501(C) 3 nonprofit as the third party easement holder. This will be done before final approval of all wetland credits.

4. Determination of Credits

The IRT will determine credits based on wetland acres that meet or exceed performance standards, described in Section 8, and the credit ratios approved in the ILF instrument (page 34) and shown in Table 1. The IRT will consider buffer credits based on a site evaluation. A draft credit table is provided in this plan and will be modified as yearly monitoring provides specific information on the size and quality of the wetlands and upland buffers being developed.

Credits: Due to the topographic position and prior hydrological modifications, there is significant opportunity to reestablish a large riparian wetland complex and surrounding upland buffer. We estimate that wetland re-establishment (emergent marsh, scrub-shrub, forested) will total 45.4 acres, and wetland enhancement to total another 5.98 acres. Provided the values associated with a large floodplain wetlands, we suggest a 1:1 credit ratio for wetland reestablishment and a ratio of 4:1 be applied to enhancement. Upland buffers are also an important component of wetland and riparian zones that stabilize soils, improve diversity, and reduce landscape fragmentation. The sponsor anticipates re-establishing 24.73 acres of upland buffer in the floodplain, and rehabilitating another 20.92 acres of buffer (forest and grassland rehabilitation areas) as depicted in Figure 3. Provided the re-establishment of upland floodplain forest will substantially increase the long-term sustainability of the project by preventing erosion and limiting points of entry for invasive species – we propose a ratio of 4:1 for buffer reestablishment (PFO areas). A credit ratio of 8:1 is proposed for rehabilitating upland forest and grassland buffers. Existing forested wetlands (4.67 acres) shown in Figure 3 are separated spatially from the main mitigation work area and are not proposed for inclusion in credit generation. As part of normal ILF program accounting, these “assurance preservation acres” will be proposed for inclusion as part of the alternative financial assurance measures described in the

ILF program instrument. In sum, we estimate that 55.692 credits will be generated as depicted in Table 1 and Figure 3 through a combination of PSS, PFO, and PEM wetland reestablishment, wetland enhancement, and upland buffer rehabilitation and establishment. This credit total is being developed in advance of anticipated impacts to wetland resources; the sponsor, in its new ILF program amendment provides for 56 advanced credits, which should cover all mitigation needs in this HUA in the foreseeable future. The IRT will use its assessment criteria to determine the final credits based on wetland acres that meet or exceed performance standards, described in Section 8.

Release: TWT anticipates this site will generate 55.692 credits. Credit release will coincide with satisfaction of success criteria and other mileposts. The sponsor proposes that upon acceptance of this Mitigation Plan, 25% of total projected credits, or 13.9 credits, will be released. Ten (10) additional credits will be released upon documentation that 30, 60 and 90% of the goals respectively have been met. The remaining 11.792 credits will be released when all performance criteria are met. Final credit amounts will be adjusted (up or down) to account for actual acres developed and rehabilitated (wetland and upland), and based on the degree to which areas meet performance goals stated in section 8.1.

Table 1 Credit Generation

Credit determination, based on habitat type and size – habitats shown in Figure 3					
Area	Cover type	Acres	Mitigation type	Ratio used	Credits
A	PEM Wetland	5.98	Enhancement of existing wetlands	4:1	1.495
B	PEM Wetland	7.37	Re-establishment	1:1	7.37
C	PSS Wetland	35.15	Re-establishment	1:1	35.15
D	PFO Wetland	2.88	Re-establishment	1:1	2.88
E	Floodplain Forest Buffer	24.73	Buffer Re-establishment	4:1	6.183
F	Upland Forest Buffer Rehabilitation	4.39	Buffer rehabilitation	8:1	0.548
G	Upland Grassland Buffer Rehabilitation	16.53	Buffer rehabilitation	8:1	2.066
	Total	**97.03**		**Total**	**55.692**

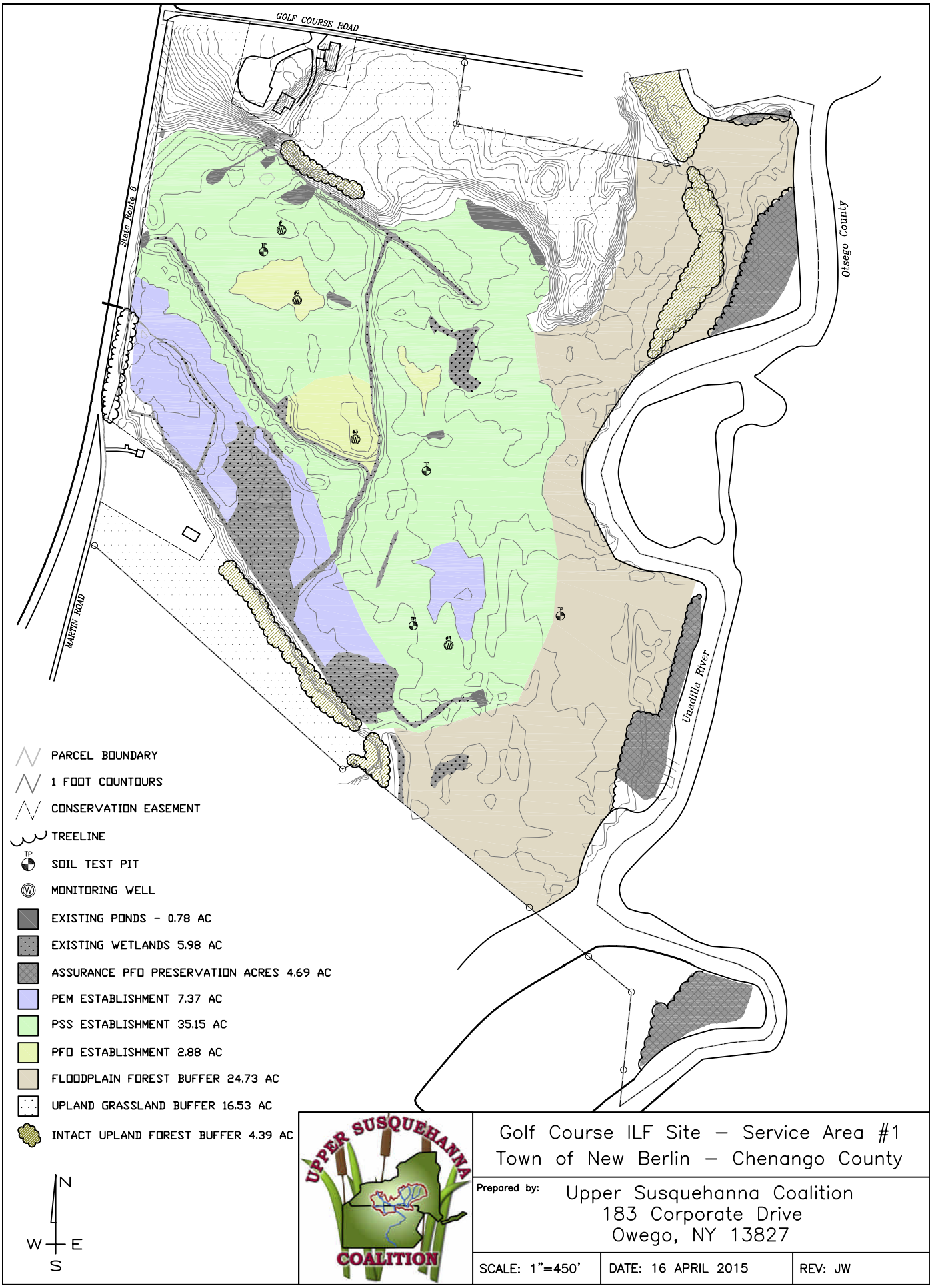

Figure 3 Site Plan.

5. Baseline Ecological Characteristics

5.1. Historic and Existing Plant Communities, Including Wetlands

Prior to acquisition by TWT, the ILF site was maintained as a golf course, initially with nine holes, and later absorbing a second southerly parcel to become an 18-hole golf course. Up until 2013, most of the parcel was mowed up to the water's edge along ponds and linear wetlands, greatly reducing plant and animal species diversity. The site was subject to repeated hydrological manipulation and drainage as depicted in the historical aerial photography in the Land Use section of this document (Figure 4 and subsequent text provides a visual and written summary of manipulations). The site now consists of mostly open fields in the former golf course fairways, and small areas of emergent marsh, linear wetlands, and ditches. The eastern portion of the property is bounded by mature floodplain forest along the Unadilla River, and a thin strip of wooded uplands along the southern boundary of the property. A few deciduous and coniferous tree species can be found interspersed throughout the site. The plant species composition at the site is presently dominated by common dandelion (*Taraxacum officionale*) (FACU), fescue grass (*Festuca rubra*) (FACU), common plantain (*Plantago major*) (FACU), dock (*Rumex crispus*) (FAC), and mustard species cuckoo flower, (*Cardamine pratensis*) (no status), and field mustard (*Brassica rapa*) (UPL).

Looking east toward the Unadilla River on 5 May 2014. Shows typical upland areas.

Southeastern portion of the property was dominated by upland plants upon field visitation in 2014.

View looking toward Unadilla River on 15 September 2014.

Forested Areas

Due to prior land-use conversion initiated prior to the 1930's less than 10% of the site was forested as of 2015. Most of the remaining forest lies adjacent to the Unadilla River where it exists as a mosaic of upland and wetland floodplain forest as depicted in Figure 3. Tree species composition in forested areas adjacent to the Unadilla River is dominated by a mixture of Freeman's Maple (*Acer* x *freemanii*), American sycamore (*Platanus occidentalis*), and red maple (*Acer rubrum*). Several isolated trees occur as landscape plantings throughout the site including willow (*Salix* spp.), white and Norway Spruce (*Picea glauca*; *P. abies*) they are typically individual trees within the old golf course fairways. Small isolated patches of upland forest exist near the Golf Course clubhouse at the northern portion of the property, and to the south of an un-named tributary to the Unadilla River at southern end of the property. Both areas are dominated by black cherry (*Prunus serotina*) with non-native honeysuckle (*Lonicera* spp.) being the dominant shrub. No clearing of forested areas is proposed.

Floodplain forest adjacent to Unadilla River

Juglans cineria (butternut/white walnut) pictured here was found along the banks of the Unadilla River in the Southeast corner of the property. It was historically traded by Native Americans in the region as a useful culinary species. It is distinguished from black walnut by the fuzzy leaf scar and dark chocolate colored inner bark. This culturally significant species is declining throughout much of the Northeast.

PFO Wetlands

The floodplain forest wetlands on the property (4.69) are spatially separated from the main work areas depicted in the site plan (Figure 3). These wetlands are subject to periodic flooding from the Unadilla River, particularly in early spring following snow-melt. Drift lines were common during field visits (April to October, 2014). These wetlands provide an important buffer to the Unadilla River, and they are dominated by red maple (*Acer rubrum*) (FAC), American Sycamore (*Platanus occidentalis*) (FACW), and Freeman maple (*Acer* x *freemanii*). Freeman maple (no indicator status) is one of the more dominant of the trees in the floodplain forest; it is a naturally occurring fertile hybrid of red and silver maple (*A. rubrum* (FAC) & *A. sacharinum* (FACW)). Common herbaceous species in the floodplain forest include skunk cabbage (*Symplocarpus foetidus*) (OBL), ostrich fern (*Matteuccia struthiopteris*) (FAC), spotted jewelweed (*Impatiens capensis*) (FACW), and sensitive fern (*Onoclea sensibilis*) (FACW).

A forested wetland with large American Sycamore (*P. occidentalis*) and Freeman maple (*A.* x *freemanii*) shown along the Unadilla River in August 2014.

PEM Wetlands

One sloping wet meadow was located on the property and is dominated by common spike-rush (*Eleocharis palustris*) (OBL) with small patches of wetland vegetation typical of rich sloping fens, an endangered community in New York State. Other notable species include creeping spike-moss (*Selaginella apoda*) (FACW), limestone meadow sedge (*Carex granularis* (FACW), and smooth saw-grass (*Cladium mariscoides*) (OBL).

Other existing emergent wetlands on the property as depicted in Figure 3 are dominated by broad-leaved cattail (*Typha latifolia*) (OBL), lamp rush (*Juncus effusus*) (OBL), American bur-reed (*Sparganium americanum*) (OBL), lakebank sedge (*Carex lacustris*) (OBL), and tussock sedge (*Carex stricta*) (OBL). Some sparse shrub cover is present (typically <15% cover by area) along margins of linear wetland features including willow species (*Salix* spp.), red osier dogwood (*Cornus alba*) (FACW), and silky dogwood (*Cornus amomum*) (FACW). A linear PEM wetland (left) is shown. View is looking north.

Ponds

Open water ponds (0.78 acres) on the property contain several species of fish, and offer wading and dabbling birds with feeding opportunities.

9 October 2014 looking east towards the Unadilla River.

5.2 Site Land Use History, Including Structures

Land Use: A chronology of the site was established through historic aerial photo review, provided below.

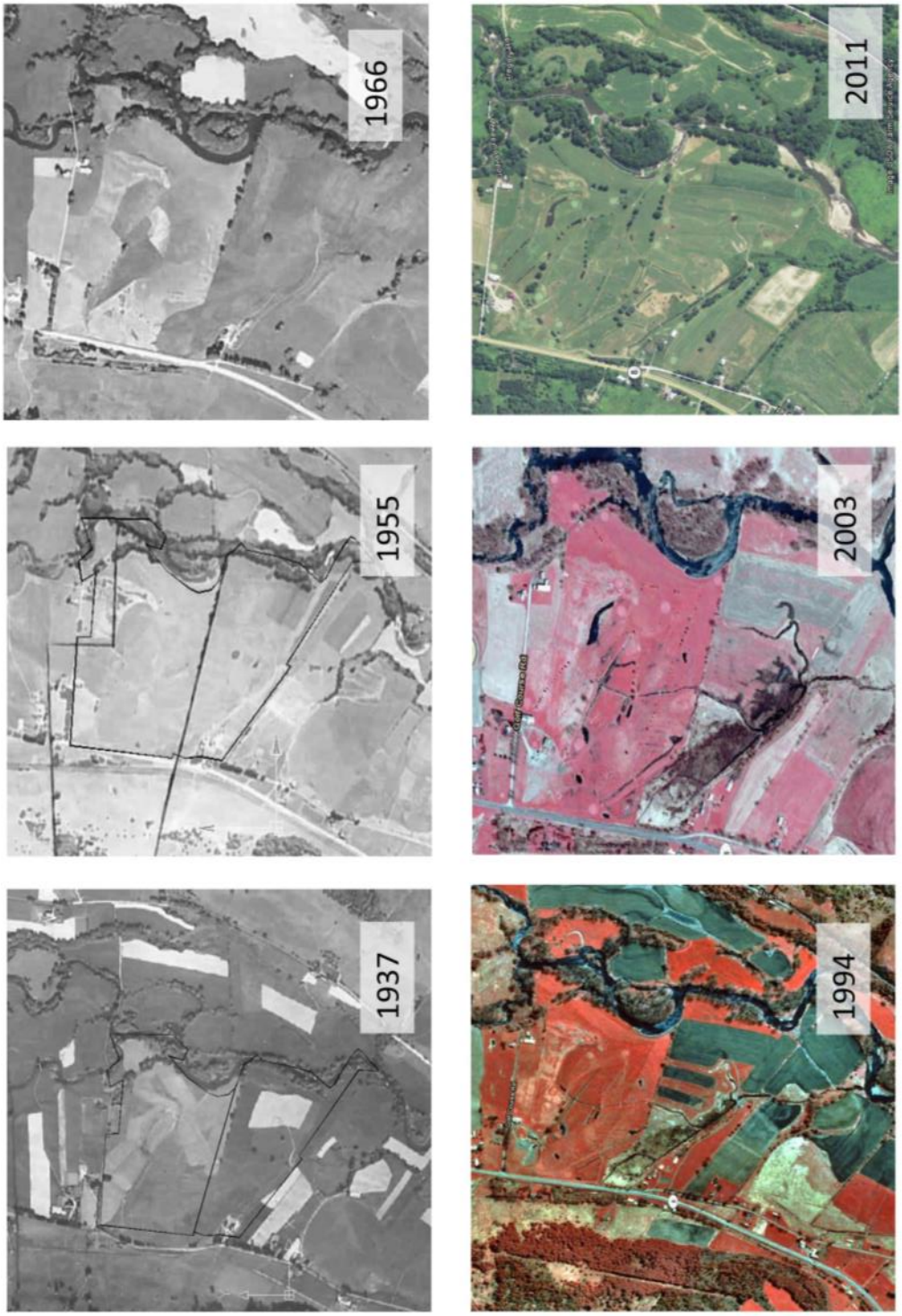

Figure 4 Site History. A written synopsis of changes is provided on the following page.

Site Chronology

The 1937 aerial photo showing the original 9 hole golf course on the northern parcel (black outline). Vegetation was completely cleared from the southern parcel, with most large portions of the property indicative of agricultural use including previous tillage. The adjacent roadway that bounds the westerly border of the site conformed to the base of the hillside and ditching and surface drainage features apparent in later years cannot yet be identified. By 1955, Route 8 is notably straighter and drainage features appears in conjunction with the installation of a box culvert under the newly formed roadway. The 1966 aerial photo shows the initial drainage ditch that originates at the Route 8 culvert and travels eastward for a short distance before hooking abruptly to the south. At the property line the ditch turns eastward and drains southeast into the Unadilla River. The drainage ditch that appeared in 1966 appears to be abandoned by 1994 (shown here), however, significant additional drainage ditching is identified across both parcels redirecting surface flows southeast. Historically the site was comprised of two distinct parcels and remained that way until approximately 2003, when the golf course acquired the southerly parcel.

Structures

At present four buildings are located on the property including a post and beam barn, built in the 1800s, a golf clubhouse constructed in 1996, a garage and concrete storage building. The barn is adjacent to the clubhouse in the NW corner of the property. The structures will be used for equipment storage and housing field staff.

5.3. Historic and Existing Hydrology

Conversations with the former landowner and residents knowledgeable of the area indicate the landowners worked collaboratively to manipulate the drainage across the two parcels after a hurricane affected the property in the early 1990's. Several additional ponds appear in the 2003 image scattered across the golf course (Figure 4). Review of aerial photography and discussions with local residents indicated the site flooded during particularly large storm events in 2006 and 2011. Drainage across the parcel is from northwest to southeast and surface flows exit the property in a ditch located in the southeast portion of the parcel.

View is looking Northwest at a point of hydrological convergence (linear PEM wetlands converging to an unnamed tributary to the Unadilla River).

View of the Unadilla River at the eastern border of the mitigation site during September 2014.

5.4. Soil Descriptions

Based on the Soil Survey of Chenango County, New York (USDA Official Soil Series Descriptions) several soil series are mapped on-site including Teel and Hamlin silt loams, Wayland soils complex, and Howard gravely loam. A soils map is provided in Figure 5. Soil conditions in the field appear to conform to the mapped soil series.

The Wayland (Wa) series consists of deep, poorly drained, nearly level soils formed in recent alluvium. These soils are in low areas or slackwater areas on flood plains. Saturated hydraulic conductivity is moderately high or high in the mineral soil. Wayland silt loams are considered hydric soils.

The Chenango series (ChB) consists of very deep, well and somewhat excessively drained soils formed in water-sorted material on outwash plains, kames, eskers, terraces, and alluvial fans. Slope ranges from 0 through 60 percent. Mean annual temperature is 47 degrees F, and mean annual precipitation is 36 inches.

The Teel series (Te, Th) consists of very deep, moderately well drained soils on floodplains. They formed in nearly level, silty alluvial deposits. Permeability is moderate. The water table extends up into the lower part of the subsoil in the winter and spring. These soils formed in alluvium predominantly from areas of glacial drift that contains limestone, fine grained sandstone and granite. Slope ranges from 0 to 3 percent. Teel Silt loams are typically not hydric soils, except when modified by localized hydrologic inputs.

The Hamlin (Ha) series consists of very deep, well drained soils formed in alluvium on flood plains and high bottoms. Permeability is moderate in the upper and substratum. The soils formed in post glacial alluvium mainly from areas of siltstone, shale and limestone.

Howard soils (HoB) consist of very deep, well drained and somewhat excessively drained soils formed in medium textured glacial outwash deposits. The soils are on valley terraces, outwash plains, kame moraines, and eskers.

Figure 5 Soils Map.

5.5. Animal and Plant Species Including Endangered Species

The following species were identified during several site visits conducted between January 2014 and October 2014. Site visits were conducted by knowledgeable biologists visiting on site, and from species reports from the New York DEC for the nearby portions of the Unadilla River.

Table 2-A. Wildlife Species Identified.

Common Name	Scientific Name	Conservation Status	Notes
Mammals			
black bear	*Ursus americanus*		
eastern coyote	*Canis latrans*		
gray squirrel	*Sciurus carolinensis*		
muskrat	*Ondatra zibethicus*		
opossum	*Didelphis virginiana*		
raccoon	*Procyon lotor*		*reported*
whitetail deer	*Odocoileus virginianus*		
Fish			
bluegill	*Sepomis macrochirus*		
brown trout	*Salmo trutta*		*DEC reports from Unadilla River*
common carp	*Cyprinus carpio*		*DEC reports from Unadilla River*
large-mouth bass	*Micropterus salmoides*		
perch	*Perca flavescens*		
small-mouth bass	*Micropterus dolomieu*		
walleye	*Sander vitreus*		*DEC reports from Unadilla River*
Reptiles			
garter snake	*Thamnophis sirtalis*		
painted turtle	*Chrysemys picta*		
snapping turtle	*Chelydra serpentina*		
Amphibians			
Eastern red spotted newt	*Notophthalmus viridescens*		
green frog	*Lithobates clamitans*		
wood frog	*Lithobates sylvaticus*		

Table 2-B Bird Species Identified.
Compiled by Matthew Young, Cornell Laboratory of Ornithology on 17 May 2014, USC additions spanned the period January-October 2014.

Common Name	Scientific Name	Conservation Status	Notes
American Crow	*Corvus brachyrynchos*		
American Goldfinch	*Spinus tristis*		
American Kestrel	*Falco sparverius*		
American Redstart	*Setophaga ruticilla*		
American Robin	*Turdus migratorius*		
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	
Baltimore Oriole	*Icterus galbula*		
Barn Swallow	*Hirundo rustica*		
Belted Kingfisher	*Megaceryle alcyon*		
Black-Billed Cuckoo	*coccyzus erythropthalmus*		
Black-Capped Chickadee	*Peocile atricapillus*		
Blue Jay	*Cyanocitta cristata*		
Bobolink	*Dolichonyx oryzivorus*		
Brant	*Branta bernicia*		
Brown Thrasher	*Toxostoma rufum*		
Canada Goose	*Branta canadensis*		
Cedar Waxwing	*Bombycilla cedrorum*		
Chimney Swift	*Chaetura pelagica*		
Chipping Sparrow	*Spizella passerina*		
Common Grackle	*Quiscalus quiscula*		
Common Merganser	*Mergus merganser*		
Common Yellowthroat	*Geothlypus trichas*		
Cooper's Hawk	*Accipiter cooperii*	Special Concern	
Downy Woodpecker	*Picoides pubescens*		
Eastern Bluebird	*Sialia sialis*		
Eastern Kingbird	*Tyrannus tyrannus*		
Eastern Meadowlark	*Sturnella magna*		
Eastern Phoebe	*Sayornis phoebe*		
Eastern Wood-Pewee	*Contopus virens*		
European Starling	*Sturnus vulgaris*		
Gray Catbird	*Dumetella carolinensis*		
Great Blue Heron	*Ardea herodias*		
Great Horned Owl	*Bubo virginianus*		
Great-Crested Flycatcher	*Myiarchus crinitus*		
Hairy Woodpecker	*Picoides villosus*		
Hooded Merganser	*Lophodytes cucullatus*		
House Finch	*Haemorhous mexicanus*		

Common Name	Scientific Name	Conservation Status	Notes
House Wren	*Troglodytes aedon*		
Killdeer	*Charadrius vociferus*		
Least Flycatcher	*Empidonax minimus*		
Mallard	*Anas platyrhynchos*		
Mourning Dove	*Zenaida macroura*		
Northern Cardinal	*Cardinalis cardinalis*		
Northern Flicker	*Colaptes auratus*		
Osprey	*Pandion haliaetus*	Special Concern	
Pileated Woodpecker	*Dryocopus pileatus*		
Pine Warbler	*Setophaga pinus*		
Purple Finch	*Haemorphos purpureus*		
Red-Bellied Woodpecker	*Melanerpes carolinus*		
Red-Eyed Vireo	*Vireo olivaceus*		
Red-Tail Hawk	*Buteo jamaicensis*		
Red-Winged Blackbird	*Agelaius phoeniceus*		
Rock Pigeon	*Columba livia*		
Savannah Sparrow	*Passerculus sandwichensis*		
Snow Goose	*Chen caerulescens*		
Song Sparrow	*Melospiza melodia*		
Swamp Sparrow	*Melospiza georgiana*		
Tree Swallow	*Tachycineta bicolor*		
Tufted Titmouse	*Baeolophus bicolor*		
Warbling Vireo	*Vireo gilvus*		
White-Breasted Nuthatch	*Sitta carolinensis*		
Willow Flycatcher	*Empidonax traillii*		
Wood Duck	*Aix sponsa*		
Yellow Warbler	*Setophaga petechia*		
Yellow-Rumped Warbler	*Setophaga coronata*		
Yellow-Throated Vireo	*Vireo flavifrons*		

Table 2-C. Vascular Plants Identified.

Common Name	Scientific Name	Wetland Indicator Status	Conservation Status
American bur-reed	*Sparganium americanum*	OBL	
American golden saxifrage	*Chrysosplenium americanum*	OBL	
American manna grass	*Glyceria grandis*	OBL	
American sycamore	*Platanus occidentalis*	FACW	
American water-plantain	*Alisma subcordatum*	OBL	
arrow-leaf tear-thumb	*Persicaria sagittata*	OBL	
beareded sedge	*Carex comosa*	OBL	
black cherry	*Prunus serotina*	FACU	
black willow	*Salix nigra*	FACW+	
blackeyed susan	*Rudbeckia hirta*	FACU-	
bristly buttercup	*Ranunculus hispidus*	FAC	
butternut	Juglans cineria	FACU	
button bush	*Cephalanuthus occidentalis*	OBL	
Canada goldenrod	*Solidago canadensis*	FACU	
Canada thistle	*Cirsium arvense*	FACU	
Canadian rush	*Juncus canadensis*	OBL	
cattail	*Typha latifolia*	OBL	
chicory	*Cichorium intybus*	FACU	
common boneset	*Eupatorium perfoliatum*	FACW	
common burdock	*Arctium minus*	FACU	
common chickweed	*Stellaria media*	FACU	
common fox sedge	*Carex vulpinoidea*	OBL	
common marsh bedstraw	*Galiuum palustre*	OBL	
common milkweed	*Asclepias syriaca*	UPL	
creeping buttercup	*Ranunculus repens*	OBL	
creeping Jenny	*Lysimachia nummularia*	FACW	
cuckoo flower	*Cardamine pratensis*	No status	
curled dock	Rumex crispus	FAC	
cut-leaf water-horehound	*Lycopus americanus*	OBL	
daisy fleabane	*Erigeron annuus*	FACU	
dogbane	*Apocynum cannabinum*	FAC	
Douglas fir	*Pseudotsuga menzeisii*	FACU	
duck potato	*Sagittaria latifolia*	OBL	
english plantain	*Plantago lanceolata*	UPL	
flat topped aster	*Doellingeria umbellata*	FACW	
flat-top goldentop	*Euthamia graminifolia*	FAC	
fowl manna grass	*Glyceria striata*	OBL	

Common Name	Scientific Name	Wetland Indicator Status	Conservation Status
Freeman maple	*Acer* x *freemanii*	No status	
green ash	*Fraxinus pennsylvanica*	FACW	
green bulrush	*Scirpus atrovirens*	OBL	
harlequin blueflag	*Iris versicolor*	FAC	
horsetail	*Equisetum arvense*	FAC	
joe pye weed	*Eupatorium maculatum*	FACW	
king-of-the-meadow	*Thalictrum pubescens*	FACW	
lakebank sedge	*Carex lacustris*	OBL	
lamp rush	*Juncus effusus*	OBL	
Lurid sedge	*Carex lurida*	OBL	
mannagrass	*Glyceria canadensis*	OBL	
marsh seedbox	*Ludwigia palustris*	OBL	
marsh willowherb	*Epilobium palustre*	OBL	
meadow spike-moss	*Selaginella apoda*	FACW	*S2?* NY Flora Atlas (2015)
monkeyflower	*Mimulus* sp.		
narrow-leaf cattail	*Typha angustifolia*	OBL	
new england aster	*Symphyotrichum novae-angliae*	FACW+	
nightshade	*Solanum* spp.		
nodding beggartick	*Bidens cernua*	OBL	
Norway spruce	*Picea abies*	No status	
Ostrich fern	*Matteuccia struthiopteris*	FACW	
pale green orchid	*Platanthera flava*	FACW	
pale touch-me-not	*Impatiens pallida*	FACW	
poison ivy	*Toxicodendron radicans*	FAC	
pondweed	*Lemna minor*	OBL	
poverty rush	*Juncus tenuis*	FAC	
purple avens	*Geum rivale*	OBL	
purple loosestrife	*Lythrum salicaria*	OBL	
purple-leaf willowherb	*Epilobium coloratum*	OBL	
Queen Anne's lace	*Daucus carota*	UPL	
ragged robin	*Silene flos-cuculi*	FACU	
ragweed	*Ambrosia artemisiifolia*	FACU	
rape	*Brassica rapa*	UPL	
raspberries	*Rubus* spp.		
red clover	*Trifolium pratense*	FACU-	
red fescue	*Festuca rubra*	FACU	
red maple	*Acer rubrum*	FACW	

Common Name	Scientific Name	Wetland Indicator Status	Conservation Status
red stem dogwood	*Cornus alba*	FACW	
reed canary grass	*Phalaris arundinacea*	FACW	
rice cutgrass	*Leersia oryzoides*	OBL	
river grape	*Vitis riparia*	FAC	
rough stem goldenrod	*Solidago rugosa*	FAC	
sensitive fern	*Onoclea sensibilis*	FACW	
silky dogwood	*Cornus amomum*	FACW	
skunk cabbage	*Symplocarpus foetidus*	OBL	
small-spike false nettle	*Boehmeria cylindrica*	OBL	
smartweed	*Polygonum* spp.		
soft rush	*Juncus effusus*	FACW	
soft stemmed bulrush	*Schnoplectis tabernaemontani*	OBL	
speckled alder	*Alnus rugosa*	FACW	
spike rush	*Eleocharis palustris*	OBL	
spotted touch-me-not	*Impatiens capensis*	FACW	
stiff marsh bedstraw	*Galium tinctorium*	OBL	
swamp milkweed	*Aesclepias incarnata*	OBL	
swamp verbena	*Verbena hastata*	FACW	
sweet flag	*Acorus calamas*	OBL	
sweet scented joe-pye weed	*Eutrochium purpureum*	OBL	
tearthumb	*Polygonum sagitattum*	OBL	
trembling aspen	*Populus tremuloides*	FACW	
true forget-me-not	*Myosotis scorpoides*	OBL	
Turtlehead	*Chelone glabra*	OBL	
tussock sedge	*Carex stricta*	OBL	
white clover	*Trifolium repens*	FACU-	
white pine	*Pinus strobus*	FACU	
wood nettle	*Laportea canadensis*	FACW	
woolgrass	*Scirpus cyperinus*	FACW	
yellow clover	*Melilotus officinalis*	FACU	

6. Mitigation Work Plan

6.1.Geographic Boundaries

The geographic boundaries of this ILF site are contained within the parcel boundaries as depicted in Figures 2 and 3. The two parcels encompass approximately 123.8 acres and are bounded by Route 8 to the West, the Unadilla River to the East, and Golf Course Rd. to the North. The site has two areas with buildings that fall outside of the area that will be placed under easement (clubhouse and barn, and a doublewide area located by Route 8) as shown in Figure 3.

6.2. Construction Methods, Timing and Sequencing

There will be three construction phases, construction will commence upon approval of the Mitigation Plan, receipt of required permits, and when soil and weather conditions are suitable. Start dates may be delayed based on credit sales. The final grading plans are depicted in Figure 6.

Phase one, during the spring and early summer all surface excavations, drainage tile disruption and some planting will take place prior to hydrologic re-establishment measures. Several spoil piles located in the southwesterly portion of the site will be removed as will several small bridges and culvert pipes.

Phase two, during the summer months the existing culvert that serves as the principle outlet for the site will be replaced with a new culvert and water control structure to re-establish historical water levels across the property. The water control structure will be an in-line structure with flash boards for water level regulation. Prior to culvert replacement, dewatering measures shall be implemented to reduce surface flows across the workspace. All surface flows shall be pumped around the workspace and re-enter the watercourse downstream in a manner that does not promote erosion nor disruption of flows. A secondary pump shall be placed immediately downstream from the workspace to capture any silt laden water from entering the watercourse. Silt laden water shall be pumped into a filter bag with a minimum of 50’ vegetative buffer between the filter bag and the waterbody. The existing culvert will be removed in addition to any road fill material unsuitable for re-compaction. New corrugated plastic pipe will be installed as the inlet and outlet of the water control structure. Suitable soil material shall be re-compacted around the new pipe and structure in a minimum of 6” lifts. Groundwater well elevation data

collection began in 2014 and will be recorded throughout the monitoring period; if the seasonal high water table elevation is inadequate to re-establish hydric soil conditions in the upper 12" in consultation with the IRT we will review the need to install a groundwater dam to further raise the water-table.

Phase three, during spring and fall months, forested and scrub shrub areas shall be planted at the specified density in accordance with the planting plan. Emergent areas will also be planted with herbaceous plugs to increase vegetative diversity. All species of woody plants to be used in conjunction with compensation activities have been chosen for their attractiveness to native wildlife, their abilities to stabilize disturbed areas and their proven hardiness in the area. The species occur naturally within the region and no exotic or potentially nuisance species will be utilized. Plantings will be completed by hand to help ensure their successful establishment and all balled and burlap or container-grown trees will be mulched in a 3' diameter circle approximately 2" deep. The use of mulch around woody plantings will reduce the need for irrigation and keep down herbaceous vegetation in the immediate vicinity of each plant for a couple of years. Upon completion of planting the wetland areas, the floodplain forest buffer shall be planted during the spring and fall of 2017.

Table 3 Construction methods, timing and sequencing.

Activity	**Construction Phase**
Remove areas of fill	Phase I: Summer 2015
Re-grade site in areas of fill, create pit and mound topography	
Placement of topsoil, seeding/mulching and planting	
Disruption of drainage tile	
Remove existing bridges and culverts	
Re-grade southerly access road, replace existing culvert with new culvert pipe and water control structure	Phase II: Fall 2015
Construct groundwater dam*	
Placement of topsoil and seeding/mulching	
Tree, shrub and herbaceous plug planting in wetland areas	Phase III: Spring 2016 - 2017
Floodplain forest buffer planting	

**The need to install a groundwater dam will be determined following an examination of groundwater-well data, if hydrology is sufficient within the upper 12" to create hydric soils, the groundwater dam will not be constructed.*

6.3. Grading Plan, Including Elevations and Slopes of Substrate

The major grading operations will include micro-topographic relief to provide for varying hydroperiods and removal of fill as shown in the grading plan Figure 6. Section 6.7 outlines erosion and spoils management plans.

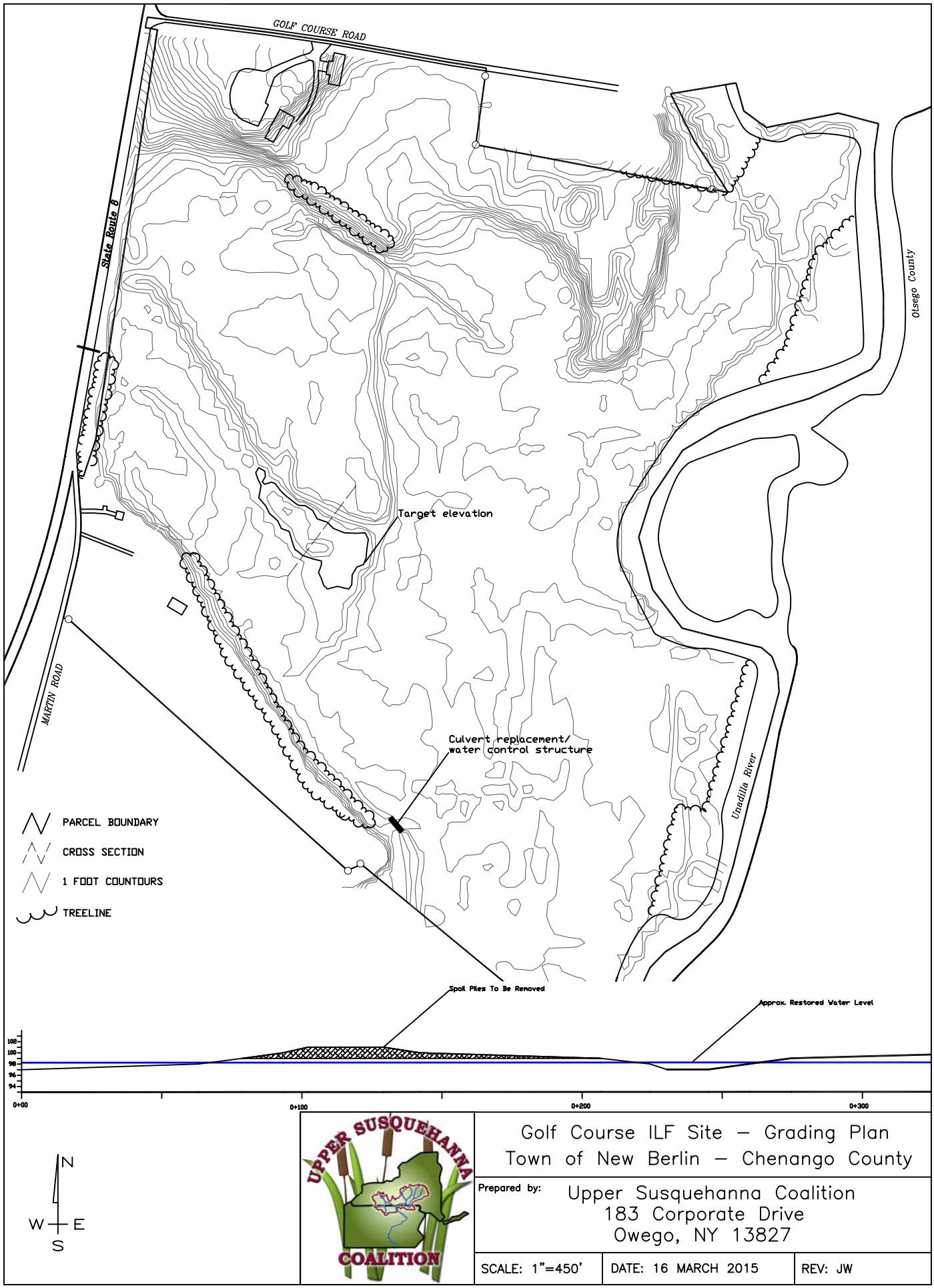

Figure 6 Grading Plan

6.4. Methods for Establishing Desired Plant Community

Establishing the desired plant community will be achieved by both passive and active means. Mowing ceased in 2014 following acquisition of the site by TWT, which will facilitate a return to a more natural vegetative cover state. Active planting of the site with native plants indicated in Table 4 will also help to return the site to a vegetated wetland state. Due to the large area to be planted with native hydrophytic vegetation, planting will occur in phases and will be spread out over two years.

Table 4. List of Species to be Planted at Mitigation Site.

Target Zone	Common Name	Scientific Name	Wetland Indicator Status	Propagule Type	Quantity/acre
All Wetland Areas	Wetland seed mix including wool grass, tussock sedge, fox sedge, bearded sedge, fringed sedge, shallow sedge, hop sedge ,soft rush, green bulrush, soft stemmed bulrush, swamp milkweed	*Scirpus cyperinus, Carex crinita, Carex lurida, Carex lupulina, Carex stricta, Carex vulpinoidea, Scirpus atrovirens, Juncus effusus, Schoenoplectus tabernaemontani, Aesclepias incarnata*	OBL-FACW	seeds or plugs	*2 lbs. seed mixture, and/or Plugs at density of 3ft on center*
PEM	American water-plantain	*Alisma subcordatum*	OBL	plugs	*Plugs at density of 3ft on center*
	duck potato	*Sagittaria latifolia*	OBL		
	bur-reed	*Sparganium americanum*	OBL		
	marsh fern	*Thelypteris palustris*	FACW		
	golden groundsel	*Packera aurea*	FACW	seeds or potted plugs	*0.5 lbs seed, and/or Plugs at density of 3ft on center*

Target Zone	Common Name	Scientific Name	Wetland Indicator Status	Propagule Type	Quantity/acre
PSS	red osier dogwood	*Cornus sericea* (*alba*)	FACW	bare root/potted	*sum to ≥400 stems / acre*
	speckled alder	*Alnus incana*	FACW		
	silky dogwood	*Cornus amomum*	FACW		
	arrow-wood	*Virburnum dentatum*	FAC		
	buttonbush	*Cephalanthus occidentalis*	OBL		
	winterberry	*Ilex verticilata*	FAC		
	common witch hazel	*Hamamelis virginiana*	FACU		
	royal fern	*Osmunda spectabilis*	FACW	potted	*20 plugs / acre*
	Wetland seed mix with the following species: button bush, arrow wood, elderberry, silky dogwood, joe pye weed, many-leaved bulrush, fringed sedge, nodding bur marigold, swamp milkweed, blue iris, flat-top white aster, bladder sedge	*Cephalanthus occidentalis, Virburnum dentatum, Sambucus canadensis, Cornus ammomum, Verbena hastata, Eupatorium maculatum, Scirpus polyphyllus, Carex crinita, Bidens cernua, Asclepias incarnata, Iris versivolor, Doellingeria umbellata, Carex intumescens*	OBL-FACW	seed mix	*2 lbs.seed mixture, and/or Plugs at density of 2 to 3ft on center*
PFO	eastern white pine	*Pinus strobus*	FACU	bare root/potted	*sum to ≥400 stems / acre*
	balsam fir	*Abies balsamea*	FAC		
	American larch	*Larix laricina*	FACW		
	American sycamore	*Platanus occidentalis*	FACW		
	red maple	*Acer rubrum*	FAC		
	black willow	*Salix nigra*	OBL		
	quaking aspen	*Populus tremuloides*	FACU		
	northern white cedar	*Thuja occidentalis*	FACW		
	yellow birch	*Betula alleghaniensis*	FAC		
	black chokeberry	*Aronia melanocarpa*	FAC		
	red osier dogwood	*Cornus sericea* (*alba*)	FACW		
	silky dogwood	*Cornus amomum*	FACW		
	cinnamon fern	*Osmunda cinnamomea*	FACW	potted	*20 plugs / acre*

Target Zone	Common Name	Scientific Name	Wetland Indicator Status	Propagule Type	Quantity/acre
Floodplain Forest Buffer	red maple	*Acer rubrum*	FAC	potted	*sum to >250 stems / acre*
	swamp white oak	*Quercus bicolor*	FACW		
	American Sycamore	*Platanus occidentalis*	FACW		
	Silver maple	*Acer saccharinum*	FACW		
	pussy willow	*Salix discolor*	FACW		
	Seed mix with the following species: button bush, arrow wood, elderberry, silky dogwood, joe pye weed, many-leaved bulrush, fringed sedge, nodding bur marigold, swamp milkweed, blue iris, flat-top white aster, bladder sedge	*Cephalanthus occidentalis, Virburnum dentatum, Sambucus canadensis, Cornus ammomum, Verbena hastata, Eupatorium maculatum, Scirpus polyphyllus, Carex crinita, Bidens cernua, Asclepias incarnata, Iris versivolor, Doellingeria umbellata, Carex intumescens*	OBL-FACW	seed mix	2 lbs.seed mixture / acre

**Species are subject to commercial availability*

6.5. Sources of Water, Connections to Existing Waters and Upland Runoff

A series of large ditches run throughout the site, conveying water southwesterly across the property to an unnamed tributary to the Unadilla River. Conversations with former owners indicated that a series of drainage tiles also feeds water into ditches. We estimate that this network of ditching and tile drainage has lowered the water-table over the majority of the low-lying portions of the parcel by two or more feet. In April of 2014 we established 4 water table level monitoring locations throughout the parcel as depicted in Figure 3 to better understand hydrological dynamics at the site. Large rainfalls in May were well documented across the site, and corresponded with saturation of the soil surface within the plant rooting zone, and standing water at a two of the monitoring locations. Through the installation of a water-control structure, we anticipate being able to re-establish the water table at a level more comparable to that prior to manipulation.

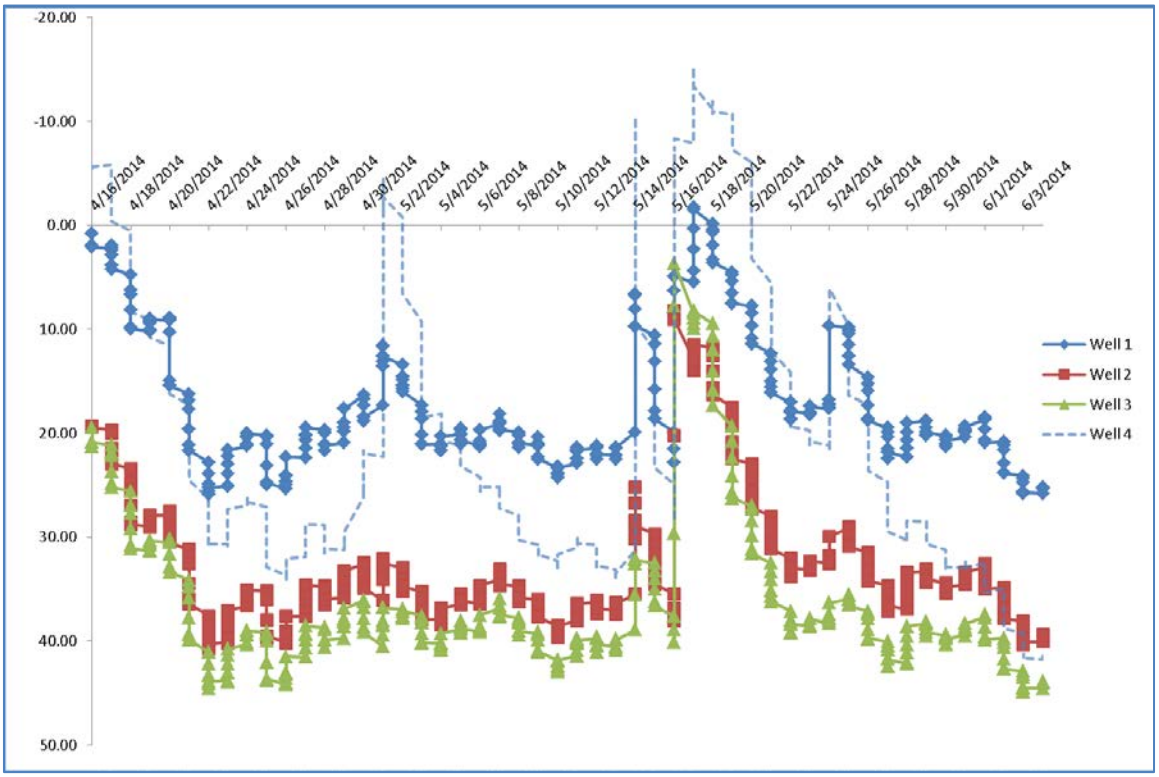

Figure 8. Monitoring Well Data.
Data are expressed as groundwater depth from soil surface at each monitoring location in inches (April 16 – June 4, 2014), with soil surface at 0.00".

6.6. Invasive Species Control

Since TWT acquired the property, invasive species have been managed proactively. In 2014 a licensed pesticide applicator applied an aquatic-safe herbicide to purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*), and cattail (narrow-leaf (*Typha angustifolia*) and hybrid cattail (*T.* x. *glauca*)). Invasive species generally occupy a small percentage of the property, and some of the particularly aggressive invaders are not present at the site (e.g., common reed (*Phragmites australis*). TWT will continue to monitor and adaptively manage invasive species on the property through hand pulling, mechanical removal, and through application of herbicide in accordance with all state and federal regulations.

To the degree possible individual invasive species will be removed before operations begin and throughout the construction process as they are found. Spot herbicide applications may be necessary. Other appropriate methods for control will be determined at the time the species are encountered. Long-term tasks will include routine inspections in early summer (late June through

mid-July) to determine invasive species presence or absence. Species found will be rapidly controlled through hand digging or the application of herbicides before seeds reach maturity.

6.7. Soil Management and Erosion Control Measures

In consultation with the New York State Office of Parks, Recreation and Historic Preservation, the site was reviewed for potential archeological impacts and none were found (Appendix B). All slopes, soils, substrates, and constructed features within and adjacent to the work site will be stabilized following protocols described in the Golf Course Erosion and Sediment Control plan submitted to NYS DEC prior to initiation of construction activities.

7. Maintenance Plan

We will take appropriate measures after initial construction to ensure continued site maturation. Maintenance activities may be triggered by:

- Yearly monitoring (Section 9), which will describe any specific adaptive management techniques to apply.
- Unforeseen environmental conditions may affect the success of the project, but their effects can generally be managed through early detection. Flooding, drought, invasive species, site degradation, erosion and vandalism are examples of some adverse conditions that can be managed.
- Routine maintenance checks, for example, on plant health and vigor, unwanted plant species, trash, herbivores, and areas with chronic erosion.
- Deer herbivory is being monitored at the site. Licensed hunters operating in accordance with all state and local laws may be used to assist with control of deer populations should herbivory be deemed a problem. Other measures may be necessary.
- Corrective measures may include adding or removing plants as conditions warrant, modifying local topography to ensure wetland hydrology and additional mulching and seeding as needed. We have found that plant viability may vary from year to year so a multiple-year planting plan should be part of maintenance activity protocols.

8. Performance Standards

Success within the mitigation site is based on meeting the USACE criteria for the three parameters described in the 1987 Corps of Engineers Wetland Delineation Manual and 2009 Regional Supplement. These parameters require sufficient:

1. *wetland hydrology* to support adequate
2. *hydrophytic vegetation*, ultimately forming
3. *hydric soils*, all of which describe a functioning wetland.

The performance standards criteria, monitored over a five-year term, include the final success criteria and three interim goals. When met, each interim goal would release 10 (ten) credits. A total of 11.792 credits would be released after the final vegetative goals have been met.

8.1 Final Vegetative Cover Goals at the end of the 5-year monitoring period

a. Herbaceous hydrophyte cover (FAC or wetter) is 90% in PEM, PSS and PFO areas exceeds 90%; and

b. Any PFO/PSS area will have at least 400 shrubs/trees per acre from the species listed in Table 4; and

c. No more than 5% of the wetland area is composed of invasive species such as: reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), cattails (*Typha angustifolia* and *Typha* x. *glauca*), and Japanese Knotweed (*Polygonum cuspidatum*); and

d. A net increase in floristic quality assessment index (FQAI) (or comparable metric) above pre-construction levels is achieved for each wetland habitat type and upland buffer rehabilitation area by the end of the five-year monitoring period to reach 100% of credit release; and

e. Upland buffer rehabilitation areas will have no more than 20% cover composed of invasive species such as: buckthorn (*Rhamnus cathartica*), honeysuckles (*Lonicera* spp.), reed canary grass (*Phalaris arundinacea*).

8.2 First interim goal releases ten (10) credits when:

a. Herbaceous hydrophyte cover (FACW or wetter) is 90% in PEM, PSS and PFO areas exceeds 30%; and

b. Any PFO/PSS area will have at least 150 shrubs/trees per acre from the species listed in Table 4; and

c. No more than 25% of the wetland area is composed of invasive species such as: purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), cattails (*Typha angustifolia* and *Typha* x. *glauca*), and Japanese Knotweed (*Polygonum cuspidatum*).

d. The FQAI score for at least one designed wetland community is greater than preconstruction conditions; and

e. Upland buffer rehabilitation areas will have no more than 50% cover composed of invasive species such as: buckthorn (*Rhamnus cathartica*), honeysuckles (*Lonicera* spp.), reed canary grass (*Phalaris arundinacea*).

8.3 Second interim goal releases ten (10) credits when:

a. Herbaceous hydrophyte cover (FACW or wetter) is 90% in PEM, PSS and PFO areas exceeds 60%; and

b. Any PFO/PSS area will have at least 250 shrubs/trees per acre from the species listed in Table 4; and

c. No more than 20% of the wetland area is composed of invasive species such as: reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), cattails (*Typha angustifolia* and *Typha* x. *glauca*), and Japanese Knotweed (*Polygonum cuspidatum*).

d. The FQAI score for at least two designed wetland communities are greater than preconstruction conditions; and

e. Upland buffer rehabilitation areas will have no more than 40% cover composed of invasive species such as: buckthorn (*Rhamnus cathartica*), honeysuckles (*Lonicera* spp.), reed canary grass (*Phalaris arundinacea*).

8.4Third interim goal releases ten (10) credits when:

a. Herbaceous hydrophyte cover (FACW or wetter) is 90% in PEM, PSS and PFO areas exceeds 60%; and

b. Any PFO/PSS area will have at least 150 shrubs/trees per acre from the species listed in Table 4; and

c. No more than 15% of the wetland area is composed of invasive species such as: purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), cattails (*Typha angustifolia* and *Typha* x. *glauca*), and Japanese Knotweed (*Polygonum cuspidatum*).

d. The FQAI score for at least one designed wetland community is greater than preconstruction conditions; and

e. Upland buffer rehabilitation areas will have no more than 30% cover composed of invasive species such as: buckthorn (*Rhamnus cathartica*), honeysuckles (*Lonicera* spp.), reed canary grass (*Phalaris arundinacea*).

8.5 Wetland Hydrology and Hydric Soils

The goal is to maintain soil saturation within 12 inches of the surface for 24 days, or 13% of the 176-day growing season, determined through an analysis of water well data. The growing season can be approximated as the period of time between the average date of the last killing frost in the spring to the average date of the first killing frost in the fall. We use a temperature threshold of 28 degrees F or lower at a frequency of 5 years in 10 http://efotg.sc.egov.usda.gov/treemenuFS.aspx. Using these parameters we estimate the growing season to extend between 3 May and 13 October or 163 days based on Norwich, Chenango County, NY.

9. Monitoring Requirements

9.1 Monitoring Schedule

Site monitoring will begin after construction is completed and the site has been through one full growing season (e.g., May through September) and will continue for five (5) years. If after 2 years the performance standards have been met, then a formal request to USACE and NYS DEC will be submitted to reduce, modify or discontinue report submittal for years 3 and/or 4, resuming in year 5 regardless.

9.2 Monitoring Report Requirements

- Descriptions of the monitoring inspection protocols used.
- Hydrology data from permanent water wells as well as hydrology information derived from Wetland Determination Data Forms completed throughout the site. Locations of each water well and data point will be indicated on the as-built survey map.
- Concisely describe remedial actions completed during the monitoring year to meet the three success standards – actions such as, replanting, controlling invasive plant species (with biological, herbicidal, or mechanical methods), re-grading the site, adjusting site hydrology, etc.
- Description of other remedial actions taken.
- Report the status of all erosion control measures on the mitigation site. Identify whether they are functioning. Describe the necessity of any planned additional temporary measures.
- Review of all information collected to meet all performance goals (8.1, 8.2, 8.3, 8.4).
- Photographs taken from permanent photo points shown on a site plan).
- List of wildlife observed and other interesting biological occurrences.
- Description of the general plant health, vigor and mortality, including a prognosis for their future survival.

9.3 Reporting Schedule

Reporting will begin with a post construction report that includes as-built drawings submitted by 15 February of the year following the year in which construction is completed. Yearly monitoring reports will be submitted no later than February 15 of each year beginning the year after the submission of the post construction report. Each report cover sheet shall indicate the year and report number (i.e., 2016, Monitoring Report 1 of 5). All reports described in this section will be submitted to the Wetland IRT, and the District Engineer at the Department of the Army, at the Buffalo District Corps of Engineers 1776 Niagara Street, Buffalo, NY 14207-3199. All monitoring, reporting, requests and adaptive management implementation will be the responsibility of TWT. Measures requiring additional soil manipulation or changes in hydrology will be undertaken only after written approval from the Buffalo District Engineer.

10. Long-term Management Plan, Including Financial Arrangements

A long-term management strategy will be implemented after the site has successfully completed its initial monitoring and review period. The strategy will advocate a sustainable approach, minimizing active management activities, opting for natural wetland processes to prevail. The adaptive management plan in Section 11 describes the approach to ensure the site is sustainable. The site will be available for study and research; we expect SUNY ESF and Morrisville to use the site for graduate research. This academic partnership helps meet educational objectives for this site and also provides site visits that may reveal adaptive management needs. Additionally the site may be used as an outdoor classroom by the nearby Unadilla Valley school. The parcel will be posted for protection against trespassing as well as to delineate the boundaries for academic activities.

A combination of the USC, TWT staff and board members will carry out management activities. The TWT and USC signed a memorandum of agreement for sharing staff in 2013 to facilitate such activities. The Upper Susquehanna Coalition (USC) of Soil and Water Conservation Districts internally works under a Memorandum of Understanding (MOU) signed by each County District that is within the Susquehanna River Basin in NY as well the NY State Department of Agriculture and Markets. The authority to make this Understanding is found under NY Soil and Water Conservation Districts Law, as Amended Through the Laws of 2007- as of January 28, 2008. The law states "AN ACT establishing the State Soil and Water Conservation Committee, and creating Soil and Water Conservation Districts, constituting Chapter 9-B of the Consolidated Laws: § 10 Cooperation between districts - The directors of any two or more districts organized under the provisions of this chapter may cooperate with one another in the exercise of any or all powers conferred in this chapter."

The MOU further assigns and directs the Tioga County Soil and Water Conservation District (SWCD), 183 Corporate Drive, Owego, NY 13827 to be the administrator for the USC. Tioga County SWCD also owns the construction equipment and employs the USC Wetland Team technical staff. Website: www.u-s-c.org.

To insure financial stability TWT will continue to own the site fee simple in perpetuity. Being a 501(c)3 nonprofit, TWT will own the site tax free, which helps ensure its long-term protection. The site has received tax-exempt status. TWT has a director controlled Stewardship Management endowment for permanent long-term support of its wetland properties (the endowment can only be changed by resolution of the TWT Board) available for unforeseen site maintenance, but will secure a permanent stewardship endowment in a separate account set up for this project. The permanent stewardship endowment for this site will be funded by a $10,000 deposit for each credit sold. With an assumed sale of 28 credits, and a 5% return, the account will generate approximately $14,000 per year for stewardship and long-term management activities.

Table 5. Anticipated long-term maintenance needs

Annual maintenance activities	**Cost per year**
Yearly site inspections and legal responsibilities; 40 hours at $50	$2,000
Small equipment and operator 4 days at $800 per day	$3,200
Biologist site review; 30 hours at $50 per hour	$1,500
Total funds	**$6,700**

**Management funds will accumulate in years when no major maintenance is needed.*

11. Adaptive Management Plan, Including Addressing Invasive Species Control

Every wetland site has its own unique characteristics that should be addressed with an adaptive management plan for long-term viability. Proper monitoring of the site will ensure adaptive management activities are implemented as new information is gathered. Regular maintenance activities such as invasive species and trash removal during routine monitoring trips will reduce the need for larger intervention. TWT will annually review the status of this site to confirm that all necessary activities have been implemented. Golf Course Rd provides access and parking for wetland observation or maintenance.

Unforeseen environmental conditions can also affect a wetland's viability. Flooding, prolonged drought, invasive species, site degradation (i.e., trash dumping, illegal logging, ATV travel), erosion and vandalism are examples of some adverse conditions that with early detection and proper management can be overcome.

12. Financial Assurances

Financial assurances for the Golf Course ILF site will be established using an approved method described in TWT's ILF instrument.

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PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): November 21, 2014

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
The Wetland Trust
4729 State Route 414
Burdett, New York 14818
Attn: James Curotolo

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Buffalo District, Auburn Field Office; Riverbend Golf Course In-Lieu Fee Mitigation Site; File No. 2010-00963

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: The Wetland Trust (TWT) contracted with the Upper Susquehanna Coalition (USC) to conduct a delineation of the approximately 110-acre Riverbend Golf Course property on two tax parcels. The delineation was conducted in May, 2014. The Golf Course has not been maintained for over five (5) years and portions of former fairways are reverting to wetlands with substantial diversity. The former water traps are now dense with hydric vegetation and provide connectivity and water sources for the re-establishment and enhancement of existing wetland areas. The delineation identified approximately 11.2 acres of existing wetlands, consisting of partially drained emergent wetlands, wet meadows, and floodplain forest and 0.776 acre of open water ponds.

The parcels are bounded by Route 8 to the West, the Unadilla River to the East and Golf Course Rd The property has undergone significant previous land-cover type conversions including timber harvests, wetland drainage, tillage, installation of drain tiles, ditching, and various excavation and filling activities dating to at least the early 1900's and continuing to as recently as the early 2000's. The site was used for agriculture in the early 1900's, with agricultural practices in the southern parcel continuing through the 1990's at which time the golf course which had been in operation on the northern parcel since 1936 was expanded into the southern parcel shown. A few small ponds have also been dug throughout the parcels as water features for a golf course. The golf course itself appears to have been contoured using earthmoving equipment and later maintained through regular mowing which was discontinued and the property abandoned in 2011.

Additionally, historic wetlands on the property were filled with overburden from the large ditches that were installed throughout the property. During the November 2011 flood of the Unadilla River, the golf course was flooded beyond repair. The parcel has reverted to fallow land in its current form. The flood damaged many of the bridges and culvert crossing that were observed scattered around the property, in addition to damaging the small streams and drainages.

Reductions of historic wetland areas on the property have subjected down-stream areas to greater flood intensities, volumes, and frequencies. As a result previous land management activities, the entire property has experienced some form of land-cover type conversion.

By 1966, Route 8 had been straightened and elevated with fill, a box culvert was believed to be installed at this time. The primary ditch was created as a result of increased flows associated with the

culvert. The primary ditch flowed east along the property line into the Unadilla River. By 1994 the ditch along the property line had been abandoned and extensive ditching has occurred redirecting flows southeast. By 2003 the largest pond on the site had been excavated and the southern portion of the parcel remains in active agriculture land, despite the ditching efforts the wetland persists in the southern portion of the parcel. After the 2006 flooding the drainage patterns across the site are evident.

State: **NY** County: **Chenango** Town: **New Berlin**
Center coordinates of site: **Lat: 42.62839 Long: -75.33418**
Name of nearest waterbody: **Unadilla River**
Identify (estimate) amount of waters in the review area: **See attached Aquatic Resource Table.**

Name of any water bodies on the site that have been identified as Section 10 waters:
Tidal: **None**
Non-Tidal: **None**

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLIES):
☒ Office (Desk) Determination. Date: November 20, 2014
☒ Field Determination. Date: June 11, 2014

1. The Corps of Engineers believes that there *may be* jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this Preliminary Jurisdictional Determination (JD) is hereby advised of his or her option to request and obtain an Approved JD for that site. Nevertheless, the permit applicant or other person who requested this Preliminary JD has declined to exercise the option to obtain an Approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an Individual Permit, or a Nationwide General Permit (NWP) or other General Permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other General Permit, and the permit applicant has not requested an Approved JD for the activity, the permit applicant is hereby made aware of the following:

(1) the permit applicant has elected to seek a permit authorization based on a Preliminary JD, which does not make an official determination of jurisdictional waters;

(2) the applicant has the option to request an Approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an Approved JD could possibly result in less compensatory mitigation being required or different special conditions;

(3) the applicant has the right to request an Individual Permit rather than accepting the terms and conditions of the NWP or other General Permit authorization;

(4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary;

(5) undertaking any activity in reliance upon the subject permit authorization without requesting an Approved JD constitutes the applicant's acceptance of the use of the Preliminary JD, but that either form of JD will be processed as soon as is practicable;

(6) accepting a permit authorization (e.g., signing a proffered Individual Permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a Preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and

(7) whether the applicant elects to use either an Approved JD or a Preliminary JD, that JD will be processed as soon as is practicable.

Further, an Approved JD, a proffered Individual Permit (and all terms and conditions contained therein), or Individual Permit denial can be administratively appealed pursuant to 33 CFR Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 CFR 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an Approved JD to accomplish that result, as soon as is practicable.

This Preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for Preliminary JD

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant:
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant. **The Wetland Trust**
- ☒ Office concurs with data sheets/and delineation report. **Note that the original delineation report dated June 2014 was revised and resubmitted. The October 2014 report was accepted.**
- ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:
☐ Corps navigable waters study:
☐ U.S. Geological Survey Hydrologic Atlas:
☐ USGS NHD data.
- ☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name: **24000 scale; New Berlin South, NY**

☒ USDA Natural Resources Conservation Service Soil Survey. Citation: **The Soil Survey of Chenango County, New York, issued December 1984 and the on-line websoilsurvey. The following soils were identified on the project site:**

(Wa) Wayland series (0-3 percent slopes) – This series consists of very deep, poorly drained and very poorly drained nearly level soils formed in recent alluvium. They are found in low areas or slackwater areas on flood plains. This soil is listed as hydric in the Chenengo County Soil Survey and Predominately Hydric in the websoil survey description.

(Th) Teel silt loam (0-3 percent slopes) – This soil consists of deep, somewhat poorly drained soils found along streams and rivers where flooding occurs. They formed in nearly level, silty alluvial deposits. Permeability is moderate. Included in this mapping are areas of Wayland soils in slackwater areas and

along shallow drainageways. Raynham soils on slightly higher terraces that are not subject o flooding, and moderately well drained Teel soils on island-like benches and rises. This soil is listed as having the potential for hydric inclusions in the Chenengo County Soil Survey and Predominately Non-Hydric in the websoil survey description.

(Te) Teel silt loam (0-3 percent slopes) - This soil is moderately well drained and is deep and nearly level. It is found on flood plains along streams and revers with areas that are long and narrow or irregular in shape. Included with this soil mapping are areas of Wayland soils and somewhat poorly drained Teel soils. This soil is not listed as hydric in the Chenengo County Soil Survey and as Non-Hydric in the websoil survey description.

(Hb) Hamlin silt loam (3-8 percent slopes) – This soil consists of very deep, well drained soils formed in alluvium on floodplains and high bottoms. Permeability is moderate in the upper and substratum. These soils formed in post glacial alluvium mainly from areas of siltstone, shale and limestone. Included with this soil mapping are areas of Teel and Wayland soils. This soil is not listed as hydric in the Chenengo County Soil Survey and as Non-Hydric in the websoil survey description.

(HoB) Howard gravelly loam (3-8 percent slopes) – This soil is deep, gently sloping, and well drained to somewhat excessively drained. It is found on terraces and undulating benches in valleys. Included with this soil in mapping are areas of Castile, Phelps, and Atherton soils and Howard soils that do not have a gravelly surface layer. This soil developed in glacial outwash deposits containing significant amounts of limestone rock fragments and a broad range in other rock fragments of sedimentary and igneous origin. This soil is not listed as hydric in the Chenengo County Soil Survey and as Non-Hydric in the websoil survey description.

☒ National Wetlands Inventory map(s). Cite name: **New Berlin South, NY.** Three (3) Federally regulated aquatic resources are indicated on the NWI maps. However, construction of the golf course in 1936 and expansion in the 1990's, filled the wetlands and changed drainage patterns. Since the golf course is no longer maintained, wetland areas have begun to re-emerge now showing the three (3) originally mapped wetlands as a series of fragmented and linear wetlands with open water ponds throughout the parcel.

☒ State/Local wetland inventory map(s): **New Berlin South, NY** – One (1) state regulated buffer area is shown on the NYSDEC FWW maps. The buffer is associated with FWW BS-5, which is a forested wetland associated with the Unidilla River floodplain.

☒ FEMA/FIRM maps: **The site is within the Unadilla River floodplain.** The FEMA floodplain map Community Panel Number 36017CO279E, effective November 26, 2010 indicates the site is within a Zone A area, which is defined as an area within the 100-year flood; base flood elevations and flood hazard factors have not been determined.

☒ Photographs: ☒ Aerial (Name & Date): **bingmaps.com; googlemaps.com**
☒ Other (Name & Date): **Submitted with application.**

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

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Signature Date
Regulatory Project Manager

James Curatola, Chair, TWT 26 November 2014

Signature Date
Person Requesting Preliminary JD

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Site No.	Latitude	Longitude	Cowardin Class	Estimated amount of aquatic resource in review area	Class of aquatic resource
Wetland 1	42.62839	-75.33418	PEM	0.004	Non-Section 10 wetland
Wetland 2	42.62839	-75.33418	PEM	0.031	Non-Section 10 wetland
Wetland 3	42.62839	-75.33418	PEM	0.014	Non-Section 10 wetland
Wetland 4	42.62839	-75.33418	PEM	0.047	Non-Section 10 wetland
Wetland 5	42.62839	-75.33418	PEM	0.314	Non-Section 10 wetland
Wetland 6	42.62839	-75.33418	PEM	1.911	Non-Section 10 wetland
Wetland 7	42.62839	-75.33418	PEM	0.434	Non-Section 10 wetland
Wetland 8	42.62839	-75.33418	PEM	0.049	Non-Section 10 wetland
Wetland 9	42.62839	-75.33418	PEM	2.220	Non-Section 10 wetland
Wetland 10	42.62839	-75.33418	PEM	0.063	Non-Section 10 wetland
Wetland 11	42.62839	-75.33418	PEM	0.724	Non-Section 10 wetland
Wetland 12	42.62839	-75.33418	PEM	0.107	Non-Section 10 wetland
Wetland 13	42.62839	-75.33418	PEM	0.159	Non-Section 10 wetland
Wetland 14	42.62839	-75.33418	PFO	0.830	Non-Section 10 wetland
Wetland 15	42.62839	-75.33418	PFO	1.909	Non-Section 10 wetland
Wetland 16	42.62839	-75.33418	PFO	1.975	Non-Section 10 wetland
Wetland 17	42.62839	-75.33418	PFO	0.128	Non-Section 10 wetland
Wetland 18	42.62839	-75.33418	PFO	0.281	Non-Section 10 wetland
Pond 1	42.62839	-75.33418	Open Water	0.058	Non-Section 10 non-wetland
Pond 1	42.62839	-75.33418	Open Water	0.031	Non-Section 10 non-wetland
Pond 3	42.62839	-75.33418	Open Water	0.141	Non-Section 10 non-wetland
Pond 4	42.62839	-75.33418	Open Water	0.369	Non-Section 10 non-wetland
Pond 5	42.62839	-75.33418	Open Water	0.035	Non-Section 10 non-wetland
Pond 6	42.62839	-75.33418	Open Water	0.054	Non-Section 10 non-wetland
Pond 7	42.62839	-75.33418	Open Water	0.035	Non-Section 10 non-wetland
Pond 8	42.62839	-75.33418	Open Water	0.053	Non-Section 10 non-wetland

Appendix B. SHPO Review of Golf Course Site

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

New York State Office of Parks, Recreation and Historic Preservation

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189
518-237-8643

May 23, 2014

Patrick Raney
Upper Susquehanna Coalition
221 Harriette Ave
Syracuse, New York 13210
(via email only)

Re: CORPS PERMITS
Wetland Restoration---River Bend Golf Course
118 Golf Course Road
Town of New Berlin, Chenango County
14PR01188

Dear Mr. Raney:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based upon this review, it is the SHPO's opinion that your project will have **No Effect** upon cultural resources in or eligible for inclusion in the National Register of Historic Places.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont

Ruth L. Pierpont
Deputy Commissioner for Historic Preservation

cc. Jesse Bergevin, Oneida Nation *(via email only)*

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