3.0 PROPOSED MITIGATION

A compensatory mitigation plan was developed to mitigate for the wetland and stream impacts. Wetland impacts will be mitigated through a mitigation wetland created in a recent clay borrow area located approximately 2.4 miles from the impact site along Kyger Creek. Compensatory mitigation for stream impacts is proposed through establishment of riparian buffers on stream preservation and establishment of riparian buffers. The following table outlines the proposed on-site mitigation. A map showing the location of these areas is included as Figure 1. Photographs are included as Appendix A.

Table 4: Compensatory Mitigation

Mitigation Area	Mitigation Type	Mitigation Activity	Mitigation Extent	Mitigation Credit
Area A	Wetland	Creation	10.32 ac.	10.32 ac.
Area A	Stream	Preservation/Buffer Creation- Kyger Creek	990 l.f.	990 l.f
Area B	Stream	Preservation/Buffer Creation Unnamed Tributary to Kyger Creek	600 l.f	600 l.f
Area C	Stream	Preservation/Buffer Creation Stingy Creek & Unnamed Tributary to Stingy	1200 lf	1200 lf.
Total	Wetland			10.32 ac.
Total	Stream		2,790 l.f.	2790 l.f.

4.0 MITIGATION WORK & IMPLEMENTATION PLAN

The Gavin Plant property was inspected for an area suitable for creation or restoration of wetlands including sources of hydrology, soils, topography and a work plan was developed for a wetland mitigation area in an existing clay borrow area along Kyger Creek. The wetland mitigation site will be 12.44 acres and will include 10.32 acres of wetland creation and 2.12 acres of upland buffer. Stream mitigation will consist of creation and preservation of riparian buffers along Kyger Creek, an unnamed tributary to Kyger Creek and Stingy Creek and an Unnamed Tributary to Stingy Creek.

4.1 Wetland Mitigation Area– Existing resources

The proposed wetland mitigation area was inspected for its suitability for wetland restoration including sources of hydrology, hydric soils, and topography.

Soils

The soils in the proposed mitigation area are mapped as Taggart silt loam. This is described as a deep, somewhat poorly drained soil on terraces along streams. Approximately 10 to 15 feet of soil was excavated from this area for clay borrow to cap a landfill.

Hydrology

The proposed mitigation area is located along Kyger Creek. The elevation of the floodplains along Kyger Creek are 548. Hydrology was restored to the mitigation area by grading the site to 547.5- 548 feet and by breaking through the existing berm along Kyger Creek to bring in flood stage water to the wetland. The mitigation site is located within the 100-year floodplain.

Vegetation
There was no existing vegetation in the wetland mitigation site since it was an active clay borrow area.

4.2 Wetland Mitigation Site Preparation

Grading
The grading for the mitigation area was designed as a nearly level floodplain with elevations ranging from 548 to 547.25 and hydraulically connected to the floodplain of Kyger Creek.

Based on our observations of the hydrology of the existing wetlands, the site topographic survey and a prior hydrogeologic study, grading the site to an elevation of 548 to 547.25 feet and connecting the site to Kyger Creek will provide the desired seasonally inundated floodplain hydrology for the mitigation area. No water control structures will be used. The site was designed to be sustainable and self -maintaining.

Planting
The mitigation area will be seeded with a native seed mix, as well as, planted with plugs of native forbs and graminoids, and gallon trees and shrubs to create diverse native plant communities. The proposed communities and the species to be planted or sown are identified on the mitigation planting and seeding plan (Appendix C).

4.3 Schedule
In the Fall of 2011, fine grading was completed, 2-3 inches of leaf compost was installed and trees and shrubs were planted and the area was seeded. Plant material will be installed June 2012. Monitoring will commence in the first full growing season after completion of the mitigation planting and annual reports will be submitted until the mitigation site is released from monitoring by the USACE. Proposed riparian buffer areas will be planted in the Fall of 2013.

4.4 Construction Monitoring
Routine construction monitoring will be performed by AEP Environmental Specialists to ensure that the construction on the mitigation site is proceeding in accordance with the plans and permit conditions.

5.0 SUCCESS CRITERIA

5.1 Wetland Mitigation Success Criteria
The success criteria of the wetland mitigation area includes adequate hydrology, development of wetland soils, and establishment of native wetland vegetation.

Wetland Delineation
A wetland delineation will be submitted to the US Army Corps of Engineers for approval and verification prior to the release of the mitigation site. The acreage of the delineated areas must be equal to or greater than the mitigation acreage required by the permit.

Vegetation
The percent cover of the wetland vegetation shall consist of at least 70% native species. Greater than 50% of dominant species should meet the definition of hydrophytic vegetation. Invasive species such as cattail (*Typha sp.*), common reed (*Phragmites sp.)* reed canary grass (*Phalaris arundinacea*), and purple loosestrife (*Lythrum salicaria*) will be monitored and controlled. Establishment of hydrophytic vegetation shall be a primary indicator of sufficient hydrology and periods of inundation and/or saturation will be monitored. Woody vegetation buffers will have a minimum of 320 stems per acre. The wetland will have a VIBI score equal to a Category 2 wetland.

Hydrology

The mitigation area will be hydrologically connected to Kyger Creek. The hydrogeomorphic setting will be considered low-gradient, riverine wetland. The site will be self-sustaining since no structures are proposed to be installed to maintain hydrology. Hydrology will be sustained through natural processes of flooding and overland flow in accordance with the design.

Soils

Soils in the mitigation area will be over-excavated and a topsoil/leaf compost mix will be placed at the site to provide a proper growing media.

5.2 Stream Mitigation Success Criteria

Riparian buffers will have a minimum stem count of 320 stems per acre.

6.0 MITIGATION MONITORING

6.1 Timing

The mitigation site will be monitored biannually and a report will be submitted annually to the Ohio EPA and the USACE Huntington District. The report will contain documentation from the monitoring inspections at the beginning and end of the growing season, approximately May and September respectively, and will be submitted by December 31 of each year. The first report is due after the first full growing season. Annual reports will be submitted for five years or until the mitigation site is released from monitoring by the USACE.

6.2 Field Monitoring

Photographs

Permanent photo stations will be established at the mitigation site from which photographs will be taken each year. Additional photos may be taken as needed to illustrate site conditions. A site map will be included showing location of the photos and direction the photos were taken.

Vegetation Monitoring

Vegetation monitoring in the wetland mitigation area will be performed in 1 meter sample quadrats along established transects. Vegetation monitoring will include species composition list and percent cover, percent survivability of planted woody plant material and presence and percent cover of invasive species. A botanical survey will be conducted by means of meandering pedestrian transects to account for species not located in the quadrats.

Vegetation monitoring in the riparian buffer establishment areas will consist of establishment of one, 0.10- acre plot per area for yearly monitoring of the survivability.

Hydrology Monitoring

Water level measurements will collected at four (4) established data stations in May and September of each year. Depth to saturated soils will be measured in absence of inundated conditions.

Soil Monitoring

A minimum of one test pit per wetland mitigation acre will be excavated at a designated data point. The soil profile and hydric soil indicators will be recorded on a monitoring data form.

Remediation

A description of any maintenance or remediation measures to be implemented will be included in the yearly monitoring reports.

6.3 Release from Monitoring

The final monitoring report will include an explanation of how the functions and values of the mitigation have met the success criteria described in Section 4. This report will be followed by a request for release from monitoring.

7.0 CONTINGENCY PLAN

7.1 Reporting Protocol

If the success criteria are not met for any portion of the compensatory mitigation project in any year, an analysis of the cause(s) of failure will be prepared. AEP will propose remedial action for pre-approval. In the case that the proposed mitigation fails to meet all or any portion of the success criteria, AEP will repair and maintain the mitigation until all criteria are satisfied.

7.2 Alternative Approach

In the event that the USACE and/or Ohio EPA determine that the mitigation cannot be successfully achieved or is unacceptable, then a different mitigation would have to be approved and constructed in the same 14-digit watershed.

8.0 SITE PROTECTION

The applicant shall preserve in perpetuity the created wetland mitigation by way of an environmental covenant signed by AEP and the Ohio EPA. The environmental covenant will be filed with the Gallia County Recorder's Office.

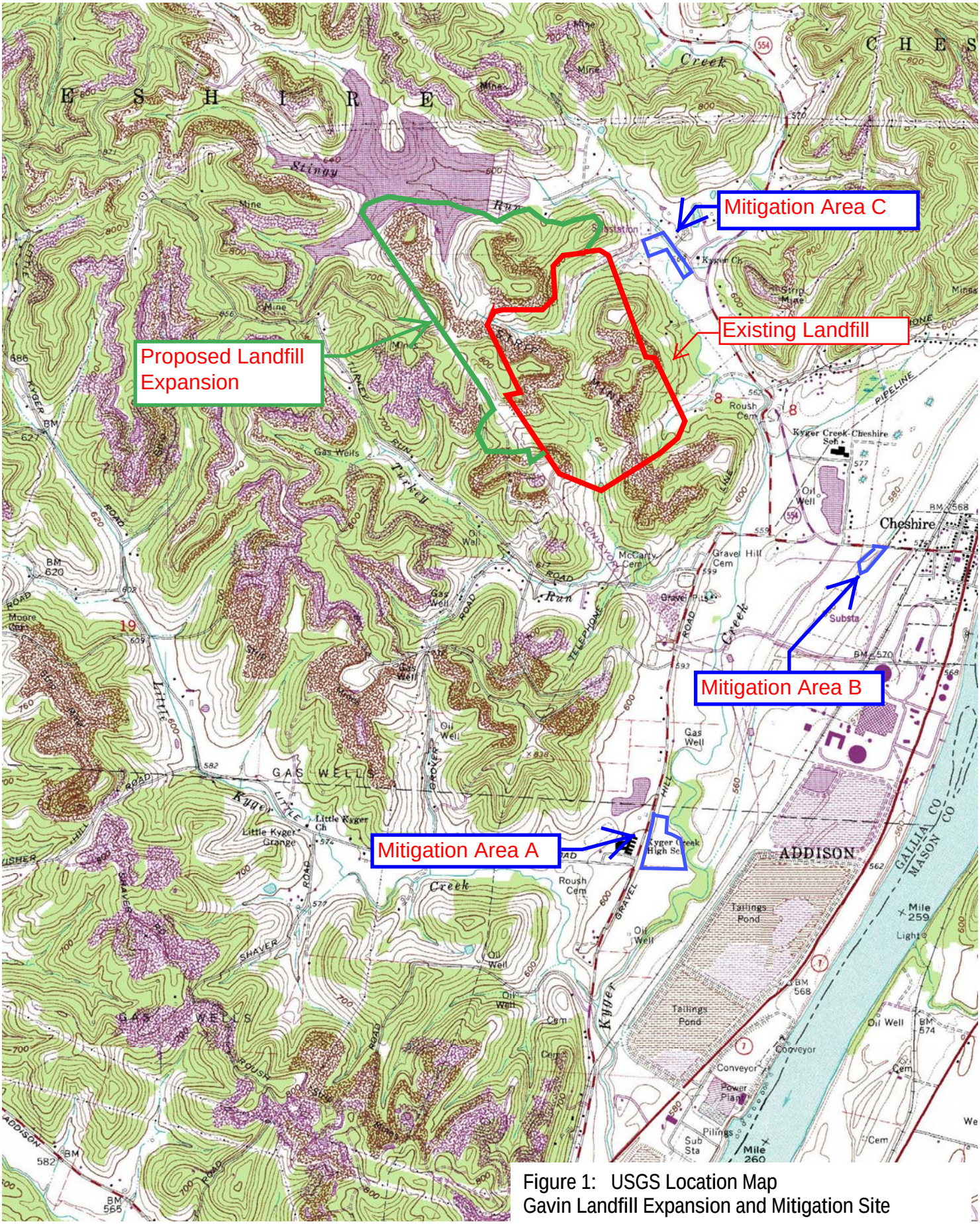


Figure 1: USGS Location Map
Gavin Landfill Expansion and Mitigation Site

Photos 1 & 2: October 2011 fine grading of the Gavin Mitigation Wetland

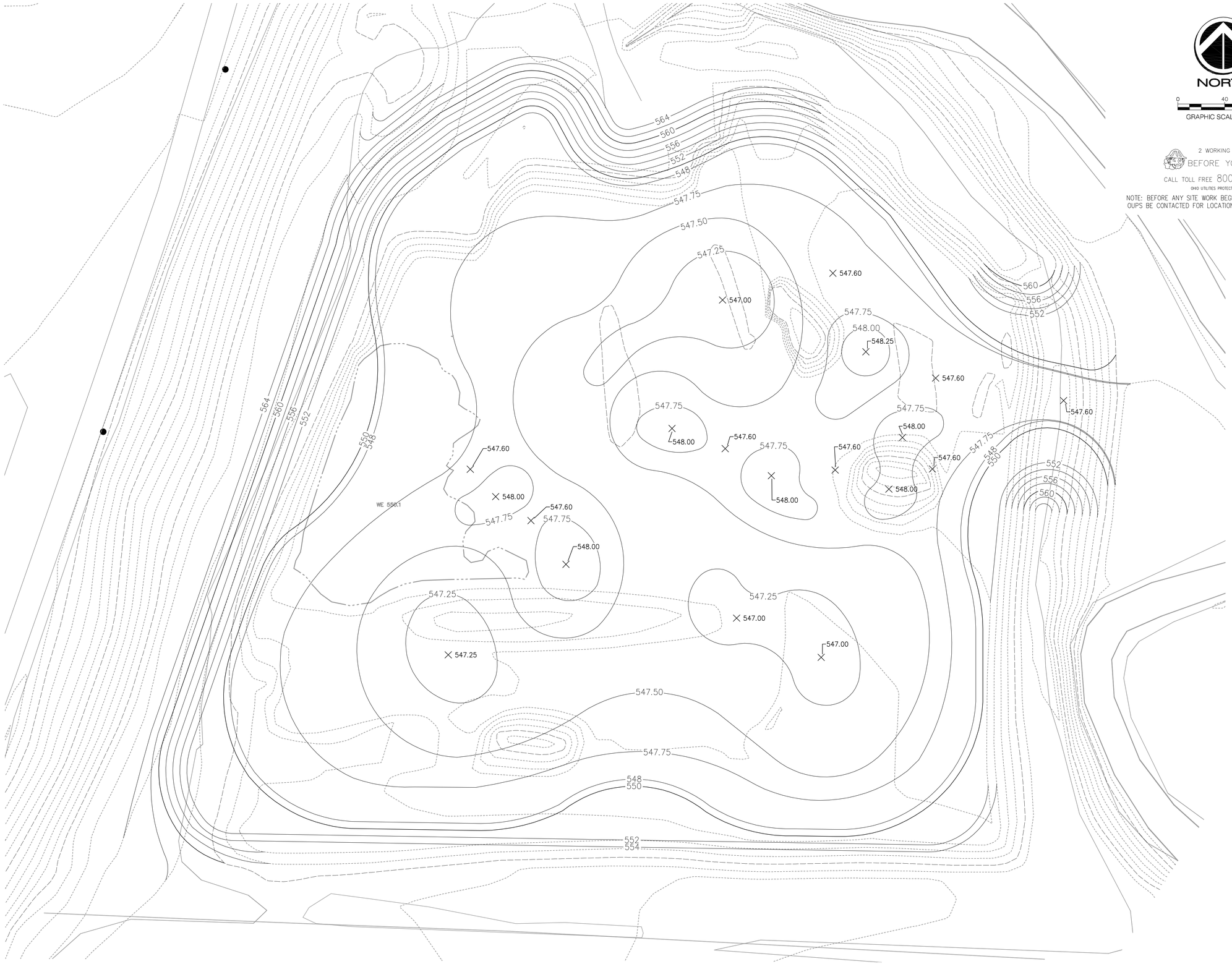
Photo 3 & 4: 11/14/2011 – Gavin Mitigation wetland- graded, compost seeding applied trees planted

Photo 5: Proposed Stream mitigation site. Riparian Buffers will be planted.

Photo 6: May 2013 – Gavin Wetland Mitigation Site- 1st Year Vegetation

Photo 7: May 2013 – 1st year vegetation growth – Gavin Mitigation Wetland

Photos 8 & 9: May 2013 - Gavin Mitigation – 1st year growth



NORTH

0 40 80
GRAPHIC SCALE IN FEET

2 WORKING DAYS
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NOTE: BEFORE ANY SITE WORK BEGINS OHIO LAW REQUIRES THAT OUPS BE CONTACTED FOR LOCATION OF UNDERGROUND UTILITIES.

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NO.	REVISION DATA	DATE	BY

☐ PERMIT ☐ PROGRESS ☐ BID ☐ CONSTRUCTION ☐ RECORD

AMERICAN ELECTRIC POWER
GAVIN PLANT WETLAND CREATION
GALLIA COUNTY , OHIO

PROJECT NO.:	10-50246-010
DESIGNED BY:	KTL
DRAWN BY:	MAI
CHECKED BY:	DJM
DATE ISSUED:	07/20/2010

GRADING PLAN

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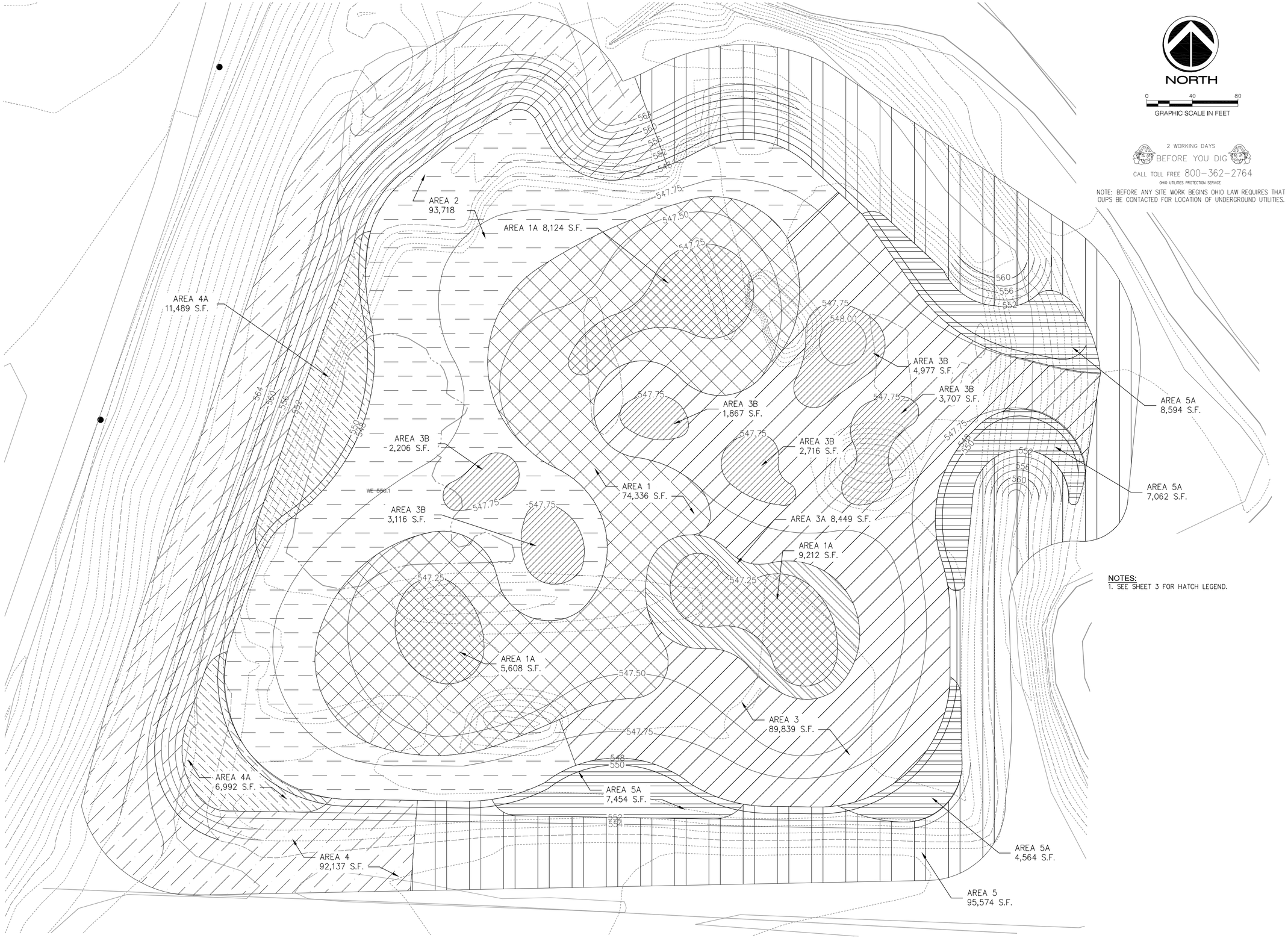

NOTES:
1. SEE SHEET 3 FOR HATCH LEGEND.

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LANDSCAPE PLAN

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WETLAND PLANT MATERIAL LIST

BOTANICAL NAME	COMMON NAME	SIZE	SPACING	CONDITION	QUANTITY	REMARKS
EMERGENT WETLAND (AREA 1 - 1.71 AC): plant 50% of entire area						
Alisma subcordatum	Water Plantain	XX	2' O.C.	DP/BR	1397	
Carex emoryi	Riverbank Tussock Sedge	XX	2' O.C.	DP/BR	931	
Carex hystericina	Porcupine Sedge	XX	2' O.C.	DP/BR	931	
Carex lurida	Lurid Sedge	XX	2' O.C.	DP/BR	466	
Carex squarrosa	Narrow-leaved Cattail Sedge	XX	2' O.C.	DP/BR	931	
Carex vulpinoidea	Fox Sedge	XX	2' O.C.	DP/BR	233	
Caltha palustris	Marsh Marigold	XX	2' O.C.	DP/BR	466	
Eleocharis erythropoda	Red-footed Spike Rush	XX	2' O.C.	DP/BR	466	
Juncus canadensis	Canada Rush	XX	2' O.C.	DP/BR	466	
Leersia oryzoides	Rice Cut Grass	XX	2' O.C.	DP/BR	233	
Sagittaria latifolia	Common Arrowhead	XX	2' O.C.	DP/BR	1397	
Scirpus validus	Soft-stem Bulrush	XX	2' O.C.	DP/BR	466	
Thelypteris palustris	Marsh Fern	XX	2' O.C.	DP/BR	931	
NOTE: OVERSEED WITH EARLY SUCCESSIONAL WETLAND MIX BY SPENCE RESTORATION NURSERY						
DEEPER EMERGENT WETLAND (AREA 1A - 0.53 AC): plant 60% of entire area						
Acorus americanus	Sweet Flag	XX	2' O.C.	DP/BR	519	
Alisma subcordatum	Water Plantain	XX	2' O.C.	DP/BR	519	
Juncus canadensis	Canada Rush	XX	2' O.C.	DP/BR	346	
Leersia oryzoides	Rice Cut Grass	XX	2' O.C.	DP/BR	346	
Pontederia cordata	Pickerel Weed	XX	2' O.C.	DP/BR	519	
Sagittaria latifolia	Common Arrowhead	XX	2' O.C.	DP/BR	346	
Saururus cernuus	Lizard's tail	XX	2' O.C.	DP/BR	346	
Sparganium americanum	American Burreed	XX	2' O.C.	DP/BR	519	
NOTE: OVERSEED WITH EARLY SUCCESSIONAL WETLAND MIX BY SPENCE RESTORATION NURSERY						
WET MEADOW (AREA 2 - 2.15 AC): plant 50% of entire area						
Asclepias incarnata	Swamp Milkweed	XX	2' O.C.	DP/BR	878	
Aster firmus	Shining Aster	XX	2' O.C.	DP/BR	585	
Carex pallita	Wooly Sedge	XX	2' O.C.	DP/BR	585	
Carex scoparia	Lance-fruited oval sedge	XX	2' O.C.	DP/BR	585	
Carex tribuloides	Blunt Broom Sedge	XX	2' O.C.	DP/BR	1171	
Eupatorium maculatum	Spotted Joe Pye Weed	XX	2' O.C.	DP/BR	1171	
Filipendula rubra	Queen of the Prairie	XX	2' O.C.	DP/BR	585	
Gentiana andrewsii	Bottle Gentian	XX	2' O.C.	DP/BR	293	
Helenium autumnale	Autumn Sneezeweed	XX	2' O.C.	DP/BR	878	
Hibiscus palustris	Swamp Rose Mallow	XX	2' O.C.	DP/BR	585	
Leersia oryzoides	Rice Cut Grass	XX	2' O.C.	DP/BR	585	
Lobelia siphilitica	Great Blue Lobelia	XX	2' O.C.	DP/BR	585	
Lycopis americanus	American Water-Horehound	XX	2' O.C.	DP/BR	585	
Mimulus ringens	Monkey Flower	XX	2' O.C.	DP/BR	878	
Physostegia virginiana	Obedient Plant	XX	2' O.C.	DP/BR	585	
Rudbeckia laciniata	Green-headed Coneflower	XX	2' O.C.	DP/BR	878	
Verbena hastata	Blue Vervain	XX	2' O.C.	DP/BR	293	
NOTE: OVERSEED WITH SEDGE MEADOW MIX BY SPENCE RESTORATION NURSERY						
SHRUB COMMUNITY (AREA 3 - 2.06 AC)						
Shrubs: plant 100% of entire area						
Cornus amomum	Silky dogwood	18" HT.	12' O.C.	#1 CONT	207	
Cephalanthus occidentalis	Buttonbush	18" HT.	12' O.C.	#1 CONT	207	
Decodon verticillatus	Swamp Loosestrife	18" HT.	12' O.C.	#1 CONT	207	
Forbs: plant 50% of entire area						
Carex bromoides	Brome Hummock Sedge	XX	2' O.C.	DP/BR	1128	
Carex crinita	Fringed Sedge	XX	2' O.C.	DP/BR	1128	
Carex emoryi	Riverbank Tussock Sedge	XX	2' O.C.	DP/BR	1128	
Carex grayii	Burr Sedge	XX	2' O.C.	DP/BR	1128	
Carex squarrosa	Narrow-leaved Cattail Sedge	XX	2' O.C.	DP/BR	2255	
Chelone glabra	White Turtlehead	XX	2' O.C.	DP/BR	2255	
Saururus cernuus	Lizard's tail	XX	2' O.C.	DP/BR	2255	
NOTE: OVERSEED WITH SEDGE MEADOW MIX BY SPENCE RESTORATION NURSERY						
BUTTONBUSH SHRUB COMMUNITY (AREA 3A - 0.19 AC)						
Shrubs: plant 100% of entire area						
Cephalanthus occidentalis	Buttonbush	18" HT.	12' O.C.	#1 CONT	58	
Forbs: plant 60% of entire area						
Carex bromoides	Brome Hummock Sedge	XX	2' O.C.	DP/BR	620	
Carex grayii	Burr Sedge	XX	2' O.C.	DP/BR	620	
NOTE: OVERSEED WITH EARLY SUCCESSIONAL WETLAND MIX BY SPENCE RESTORATION NURSERY						

BOTANICAL NAME	COMMON NAME	SIZE	SPACING	CONDITION	QUANTITY	REMARKS
SHRUB COMMUNITY HUMMUCKS (AREA 3B - 0.43 AC)						
Shrubs: plant 100% of entire area						
Cornus sericea	Red-Osier Dogwood	18" HT.	12' O.C.	#1 CONT	32	
Ilex verticillata	Common Winterberry	18" HT.	12' O.C.	#1 CONT	32	
Lindera benzoin	Spicebush	18" HT.	12' O.C.	#1 CONT	32	
Sambuscus canadensis	Common Elderberry	18" HT.	12' O.C.	#1 CONT	32	
Forbs: plant 60% of entire area						
Carex crinita	Fringed Sedge	XX	2' O.C.	DP/BR	927	
Carex grayii	Burr Sedge	XX	2' O.C.	DP/BR	927	
Carex squarrosa	Narrow-leaved Cattail Sedge	XX	2' O.C.	DP/BR	927	
NOTE: OVERSEED WITH SEDGE MEADOW MIX BY SPENCE RESTORATION NURSERY						
UPLAND PRAIRIE BUFFER (AREA 4 - 2.12 AC): plant 20% of entire area						
Andropogon scoparius	Little Bluestem	XX	2' O.C.	DP/BR	693	
Bouteloua curtipendula	Side-Oats Grama	XX	2' O.C.	DP/BR	693	
Elymus canadensis	Canada Wild Rye	XX	2' O.C.	DP/BR	462	
Heliopsis helianthoides	False sunflower	XX	2' O.C.	DP/BR	462	
Liatris spicata	Blazing Star	XX	2' O.C.	DP/BR	462	
Monarda fistulosa	Bergamot	XX	2' O.C.	DP/BR	462	
Penestemon digitalis	Foxglove beardtongue	XX	2' O.C.	DP/BR	462	
Rudbeckia fulgida speciosa	Orange Coneflower	XX	2' O.C.	DP/BR	462	
Rudbeckia subtomentosa						
NOTE: OVERSEED WITH LOW STATURE PRAIRIE MIX BY SPENCE RESTORATION NURSERY						
MESIC MEADOW (AREA 4A - 0.42 AC): plant 20% of entire area						
Baptisia australis	Blue False Indigo	XX	2' O.C.	DP/BR	92	
Carex vulpinodea	Fox Sedge	XX	2' O.C.	DP/BR	46	
Elymus virginicus	Virginia Wild Rye	XX	2' O.C.	DP/BR	183	
Eupatorium fisulosum	Joe Pye Weed	XX	2' O.C.	DP/BR	46	
Helenium autumnale	Autumn Sneezeweed	XX	2' O.C.	DP/BR	92	
Liatris spicata	Dense Blazing Star	XX	2' O.C.	DP/BR	92	
Panicum virgatum	Switch grass	XX	2' O.C.	DP/BR	183	
Penstemon digitalis	Foxglove Beard-tongue	XX	2' O.C.	DP/BR	46	
Pycanthemum virginianum	Virginia Mountain Mint	XX	2' O.C.	DP/BR	92	
Solidago rigida	Stiff goldenrod	XX	2' O.C.	DP/BR	46	
NOTE: OVERSEED WITH MESIC PRAIRIE MIX BY SPENCE RESTORATION NURSERY						
FLOODPLAIN FOREST BUFFER (AREA 5 - 2.19 AC)						
Trees: plant 100% of entire area						
Plantanus occidentalis	Sycamore	4' HT.	30' O.C.	#2 CONT	318	
Quercus bicolor	Swamp White Oak	4' HT.	30' O.C.	#2 CONT	318	
Quercus palustris	Pin Oak	4' HT.	30' O.C.	#2 CONT	318	
Forbs: plant 10% of entire area						
Elymus canadensis	Canada Wild Rye	XX	2' O.C.	DP/BR	795	
Elymus riparius	Riverbank Wild Rye	XX	2' O.C.	DP/BR	795	
Elymus virginicus	Virginia Wild Rye	XX	2' O.C.	DP/BR	795	
NOTE: OVERSEED WITH VIRGINIA WILD RYE (ELYMUS VIRGINICUS)						
FLOODPLAIN FOREST SHELF (AREA 5A - 0.64 AC)						
Trees: plant 100% of entire area						
Quercus bicolor	Swamp White Oak	4' HT.	30' O.C.	#2 CONT	11	
Quercus palustris	Pin Oak	4' HT.	30' O.C.	#2 CONT	11	
Nyssa sylvanica	Black Gum	4' HT.	30' O.C.	#2 CONT	11	
Forbs: plant 10% of entire area						
Elymus riparius	Riverbank Wild Rye	XX	2' O.C.	DP/BR	349	
Elymus virginicus	Virginia Wild Rye	XX	2' O.C.	DP/BR	349	
NOTE: OVERSEED WITH VIRGINIA WILD RYE (ELYMUS VIRGINICUS)						

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LANDSCAPE PLAN
PLANT SCHEDULE

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