

TERRA TECHNOLOGIES

Draft Mitigation Plan

For the

Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek



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I. OBJECTIVES

Swallow Tail, LLC (the Sponsor) is proposing to establish and operate the approximately 282.47-acre Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek (the Site) as part of the Sponsor's Nishnabotna / Platte EDU Wetland and Stream Umbrella Mitigation Bank (the Bank). As such, the operation of the Site will be governed by the Bank's umbrella mitigation banking instrument as well as by this mitigation plan.

The Site's objectives are equivalent to some of the Bank's objectives, addressing the primary water quality and habitat needs in the watershed by:

- Increasing wetland acreage, which:
 - Decreases sediment concentrations
 - Decreases nutrient concentrations
 - Decreases bacterial concentrations (Fecal coliform and *E. coli*)
 - Decreases chemical pollutant concentrations (herbicides, pesticides, *etc.*)
 - Addresses wetland loss
- Widening riparian buffers
- Increasing native habitat acreage
- Increasing floodplain connectivity

The Site will meet the above objectives by successfully achieving the following specific mitigation actions which will be described in further detail later in this document:

- 257.97 acres of Riparian Buffer Restoration
- 14.45 acres of Emergent Wetland Restoration
- 6.33 acres of Forested Wetland Enhancement
- 2.39 acres of Scrub-Shrub Wetland Enhancement
- 1.33 acres of Wetland Buffers
- Stream channel restoration of a previously channelized portion of Pigeon Creek
- Stream channel restoration of a previously channelized portion of Perennial #3
- Stream channel restoration of a previously channelized portion of Ephemeral #3

The Sponsor shall then protect the Site as natural habitat in perpetuity although natural ecological successional processes will be allowed to occur. Wetland Buffers on the Site are defined as those non-riparian upland areas within 100 feet of a wetland edge. The one Wetland Buffer location is a currently forested area in the southern part of the Site. Because this forested location is already providing valuable ecological functions, no mitigation activities will be conducted other than legal preservation and the elimination of all currently present individuals on the Invasive and Undesirable Species list.



The mitigation activities described above are technically feasible as there is no impediment to the planned tree plantings and the establishment of native grasses and forbs. Moreover, there is an adequate drainage area and appropriate landscape position for the amount of wetlands planned, which are located in areas of hydric soils adjacent to existing wetlands.

II. SITE SELECTION

The Site is located in central Buchanan County at the confluence of the Platte River and Pigeon Creek. Specifically, the Site is within Sections 20, 21, 28, & 29 of Township 56 North, Range 34 West with an approximate center point at latitude: 39.648321 longitude: -94.732515°. This location is shown below in Figure 1 (Bing Maps, 2018). The Site is bordered by the Platte River to the east and agricultural properties on all other sides except to the southwest where the town of Agency is located and to the north along the Platte River where a Wetlands Reserve Program site exists. Figure 2 shows an aerial photograph of the Site along with its proposed boundaries (Google Inc., 2018). A shapefile of these boundaries has been provided to the U.S. Army Corps of Engineers (Corps) and Interagency Review Team (IRT). Historical topographic maps and aerial photographs are included in Appendix A and photographic documentation of the Site is provided in Appendix B.

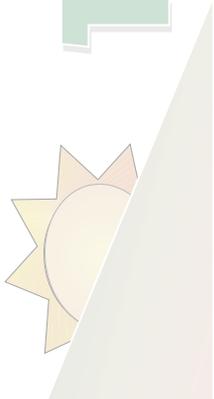
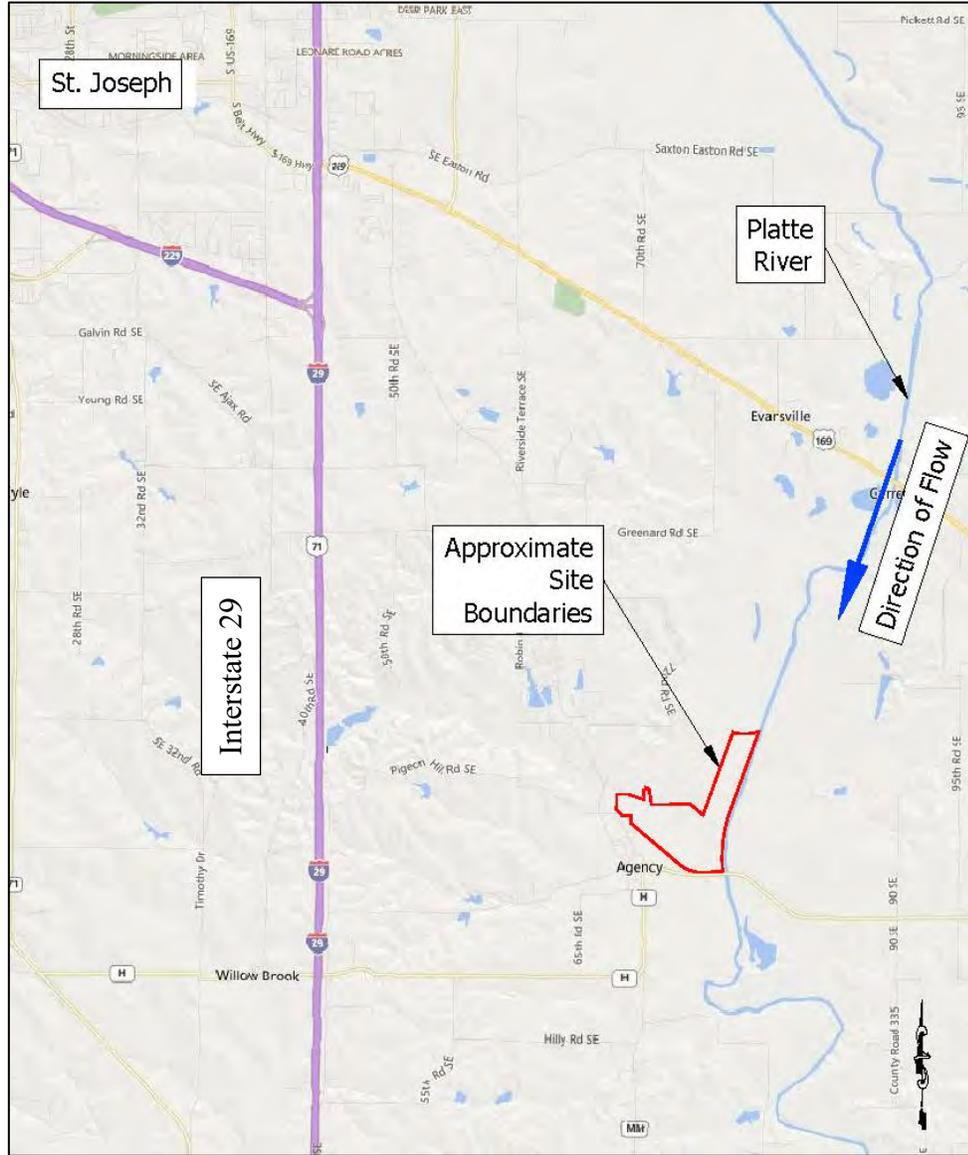


Figure 1. Site Location



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Figure 2. Aerial Photograph with Site Boundaries

The Site is ecologically suitable for wetland and stream mitigation and was selected by the Sponsor because of its potential for beneficial water quality and wildlife habitat improvements to the watershed. In particular, the presence of existing ecological impairments increases the mitigation potential of the Site. Factors considered for the site selection of this mitigation parcel included:

- Site Location Priority
 - The Platte River Subbasin (10240012) is ranked as the highest restoration priority in the Bank's service area (the 18th highest restoration priority out of the 66 8-digit Hydrologic Unit Code watersheds in Missouri). This



subbasin had a moderate probability of rehabilitation (Missouri Unified Watershed Assessment Steering Committee, 1998).

- The Site is in close proximity to several protected natural areas so the planned mitigation activities will build upon this existing network of conservation areas as a stopover point for migrating or wide-ranging species. The nearby protected natural areas include the following (LandScape America, 2018):
 - Abutting the north Site boundary is a roughly 84-acre property protected through the Wetlands Reserve Program operated by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS).
 - ~0.75 mile northwest of the Site is MDC's 424-acre Pigeon Hill Conservation Area.
 - ~0.9 mile south of the Site is MDC's 94-acre Agency Conservation Area.
 - ~2.7 river miles downstream from the site is a 151-acre property protected through the Wetlands Reserve Program.
 - ~3 river miles upstream from the site is a 151-acre property protected through the Wetlands Reserve Program.
- Onsite Mitigation Need
 - Channelization of the Platte River, Pigeon Creek, Perennial #3, and Ephemeral #3
 - Stream incision in Pigeon Creek
 - Narrow existing riparian buffers
 - Invasive species in some existing wetlands
 - Chemically intensive row crop agriculture in floodplains, through stream channels or immediately adjacent to streams

The Site's location and landscape position along a large river with a relatively flat gradient has meant that the Site's morphology and ecology has been influenced by repeated flooding. As a result, the Site is characterized by flat topography and poorly drained hydric soils.

Based on the Site's soil taxonomy and landscape features, floodplain forested conditions likely surrounded the Platte River and Pigeon Creek before agricultural conversion. Wet bottomland woodlands would have existed outside of the forested areas with wet bottomland prairies stretching from the woodland edges to the limits of the floodplain. The fact that many wetlands currently exist across the Site reinforces the preceding description of past widespread wetland condition. Additionally, the current existence of wetland conditions in almost every depressional area within the Site supports the assertion that the Site is amenable to wetland mitigation. Moreover, the Sponsor has direct experience with creating wetlands in the Site's soil types at other successful mitigation project sites where these soils were capable of maintaining wetland hydrology.



The agricultural conversion of the Site decreased the historical amount of natural wetland, stream, riparian, and upland habitats present and degraded the ecological quality of the habitats that remained. Specifically, the agricultural activities resulted in the clearing of all of the original trees and the replacement of the native plant communities with agricultural row crop fields and second growth riparian buffers dominated by early and mid-successional tree and shrub species. Riparian buffer widths have been dramatically reduced and the crop production on the site has contributed to the impaired water quality of the Platte River and downstream waters by increasing sediment, chemical, and nutrient inputs.

Despite all of the ecological degradation that has occurred, the Site still retains substantial potential for recovery and the Sponsor proposes to improve the water quality and wildlife habitat benefits provided by the Site by reversing much of the historical deterioration that has taken place. This includes restoring the native habitats that would have likely existed before agricultural conversion, including sizeable riparian buffers and floodplain wetland areas with some surrounding wetland buffers. In addition, the Sponsor proposes to reverse the past channelization of Pigeon Creek, Perennial #3, and Ephemeral #3 to restore the quantity and quality of stream habitat within the Site.

The Site has been surveyed for cultural resources and correspondence from the Missouri State Historic Preservation Office is included in Appendix F. The Missouri State Historic Preservation Office has stated that they agree with the Site's cultural resource survey and that they have no objection to the project activities. However, if evidence of cultural resources is discovered during the course of project construction, that construction shall cease and the Corps, IRT, and the Missouri State Historic Preservation Office will be notified promptly so that the correct course of action can be decided upon by the responsible regulatory agencies.

The proposed mitigation activities on the Site are not expected to have any reasonably foreseeable significant effects on federally-listed species. However, the Site is within the range of the federally-threatened northern long-eared bat (*Myotis septentrionalis*) and endangered Indiana bat (*Myotis sodalis*) and is within the White-Nose Syndrome Buffer Zone (U.S. Fish & Wildlife Service, 2015). The Sponsor will comply with all laws and regulations concerning these species. In particular, any tree removal, tree pruning, and/or controlled burning will be in compliance with the area and date restrictions in effect for northern long-eared or Indiana bats. Specifically, there will be no tree clearing between April 1 and October 31 of any year (or the current equivalent regulations in effect at a future time). Also, due to the potential impacts to federally-listed bat species, the Sponsor, or any future long-term steward or owner of the Site property, must contact the Corps prior to any timber management or timber maintenance activities, including any trimming, felling, girdling, *etc.* The Sponsor will provide the Corps with all necessary information so that the Corps can make an effects determination. If the result of the effects determination is anything other than "no effect," then the Corps will consult with the FWS under Section 7





of the Endangered Species Act. The Corps will notify the Sponsor of the approved activities, with appropriate conditions, at the completion of any Section 7 consultation with the FWS (if necessary) and in consultation with the remainder of the IRT members.

The Site is surrounded by rural and residential properties which do not pose foreseeable insurmountable short-term threats to the Site caused by detrimental surrounding land uses. Conversely, the Site will be compatible with the rural and low density residential land uses on the adjacent properties. The Sponsor owns the water and mineral rights to the property so another party cannot threaten the Site’s integrity by denying water or extracting minerals. The Site’s remote location removes significant urbanization as a potential threat because residential and commercial expansion in the watershed is mostly confined to established urban and suburban areas although it is possible that Agency may grow slightly in population. Residential development in the immediate area of the Site is diffuse at present and significant urban development in upstream areas is unlikely in the foreseeable future because of the relatively remote rural location of the Site. Once the Site is fully functional it is reasonable to believe that a slight increase of harmful chemicals from future commercial and residential expansion would not affect the aquatic functions provided by a mitigation site of this size.

It is important to note that the unlikelihood of significant future land development activities surrounding the Site does not mean that it is without some level of long-term threat from adjacent land uses. Because of their relatively high silt content, virtually the entire non-river perimeter of the Site contains soil types with a moderate susceptibility to erosion and rate of runoff (whole soil K factor scores from 0.24 to 0.37) (Soil Survey Staff, 2018). For this reason, the ongoing agricultural and low density residential land management activities surrounding the Site will ensure that the mitigation areas will continue to receive nutrient and sediment inputs from the surrounding lands for the foreseeable future. As a result, the proposed wetland buffer along a portion of the Site boundary is necessary to ensure the long-term viability and ecological functioning of the aquatic resources on the Site. There are no existing easements within the Site.

III. SITE PROTECTION INSTRUMENT

The Sponsor owns the land that contains the Site. To ensure that the Site remains natural habitat in perpetuity, the entire area will be legally protected by means of conservation easement which will preserve the Site lands as undeveloped wildlife habitat. An example conservation easement is included in Appendix E. The terms of the easement will be enforceable by the Corps and the Midwest Mitigation Oversight Association, a non-profit group that will monitor the Sponsor’s compliance with the conservation easement. After the Site is approved, copies of the finalized and recorded conservation easement shall be provided to the Corps.

It is the intention of the Sponsor to preserve the property in perpetuity in accordance with the terms of the long-term management plan and conservation easement. However, in the instance that the title to the property is transferred to another party the conservation easement shall stay with the property.

IV. BASELINE INFORMATION

The 1971 U.S. Geological Survey topographic map (Figure 3) shows that the Site lies in the floodplain of the Platte River at the confluence of Pigeon Creek with the Platte River (U.S. Geological Survey, 1971).

Figure 3. 1971 U.S. Geological Survey Topographic Map



The 1927 topographic map and aerial photographs of the Site from 1950 to 2014 are included in Appendix A. The Platte River is shown in its original unchannelized alignment in the 1927 topographic map, west of its current, straightened course on the east side of the



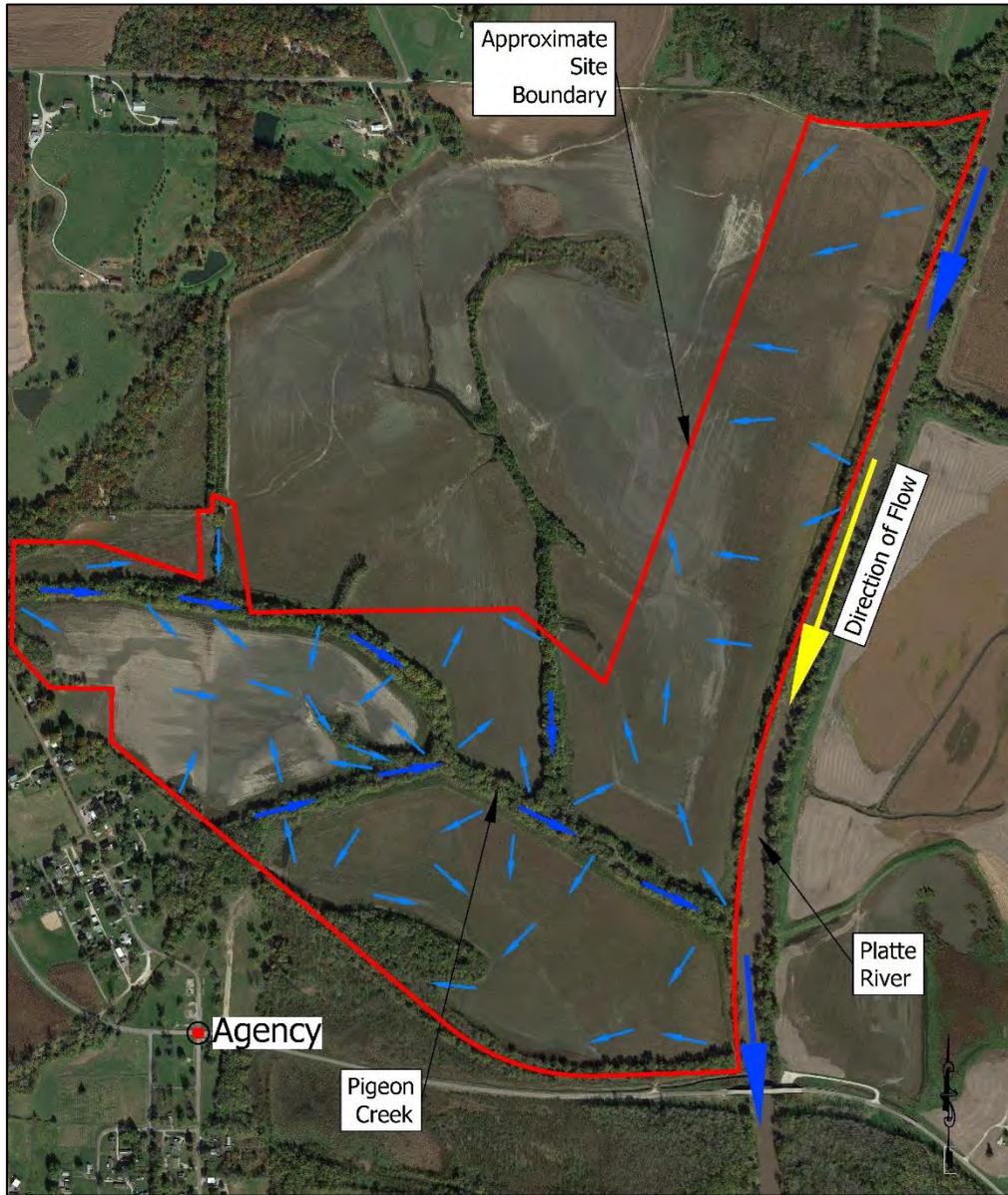
Site. Additionally, Pigeon Creek and the tributary stream delineated as Perennial #3 meander across the Site and flow into the Platte River at different locations. By the time of the 1950 aerial photograph, the Platte River had been moved to the straightened course seen today, Pigeon Creek was channelized, and Perennial #3 appears to be partially straightened. By the time of the 1969 aerial photograph, Perennial #3 follows a straightened course into Pigeon Creek rather than directly into the Platte River. The current course of the Platte River, Pigeon Creek, and Perennial #3 are shown in the 1971 topographic map, which also has lines indicating the former course of the Platte River.

The Platte River, which runs along the entire eastern border, dominates the hydrology of the Site. Pigeon Creek and Perennial #3 exhibit a secondary influence, bringing to the Site surface water flows from watersheds to the west. The channelization of these streams likely decreased the connectivity of the streams with their floodplain and reduced the residence time of stream flows on the Site. Figure 4 shows the direction of shallow concentrated flows and stream flows on the Site. Because the elevation along the Platte River and Pigeon Creek banks is higher than in the center of the existing row crop fields north of Pigeon Creek, surface runoff drains toward Intermittent #1 and its ephemeral tributaries at the center of the field, which in turn drains to Pigeon Creek. Precipitation that falls on the field south of Pigeon Creek and southeast of Perennial #3 drains towards Wetlands #17, 18, or 19 before eventually draining to Perennial #3. Precipitation falling on the field south of Pigeon Creek and northwest of Perennial #3 drains toward the center of the field, then into Ephemeral #6 and into Perennial #3.

Figure 5 shows the Federal Emergency Management Agency (FEMA) 100-year (1% annual chance) floodway (dark blue) and floodplain (light blue) limits on the Site (Buchanan County Missouri Web GIS, 2018). The floodplain covers the entire Site. The floodway covers a large portion of the Site along the Platte River and along Pigeon Creek. Because of this landscape position, much of the Site is subject to inundation from lower recurrence interval floods.



Figure 4. Baseline Conditions Surface Water Flow Paths



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Figure 5. FEMA 1% Annual Chance Floodplain and Floodway Map



According to the National Cooperative Soil Survey’s Web Soil Survey and as included as Figure 6 and Table 1 (Soil Survey Staff, 2014), the soil series mapped within the Site boundaries include Dockery silty clay loam, Nodaway silt loam, Knox silt loam, Colo silty clay loam, Gosport silty clay loam, Wiota silt loam, and Kennebec silt loam.



Figure 6. Soil Survey Map with Mapped Hydric Soil Ratings

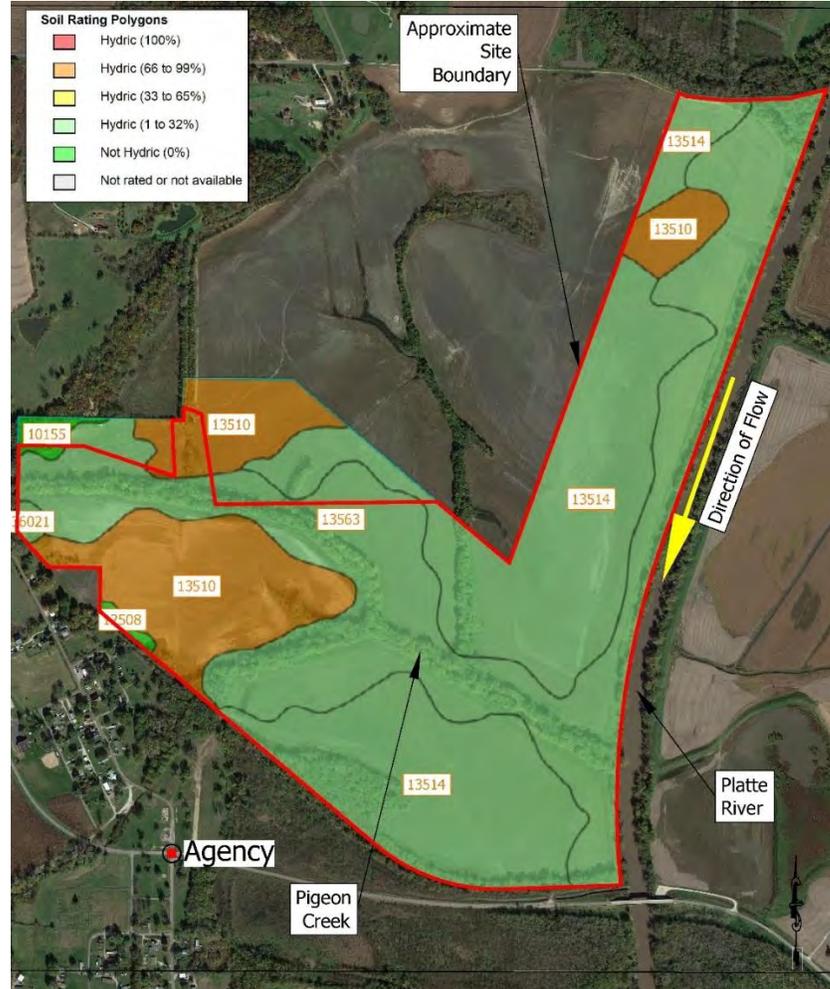


Table 1. Soil Hydric Rating and Taxonomy

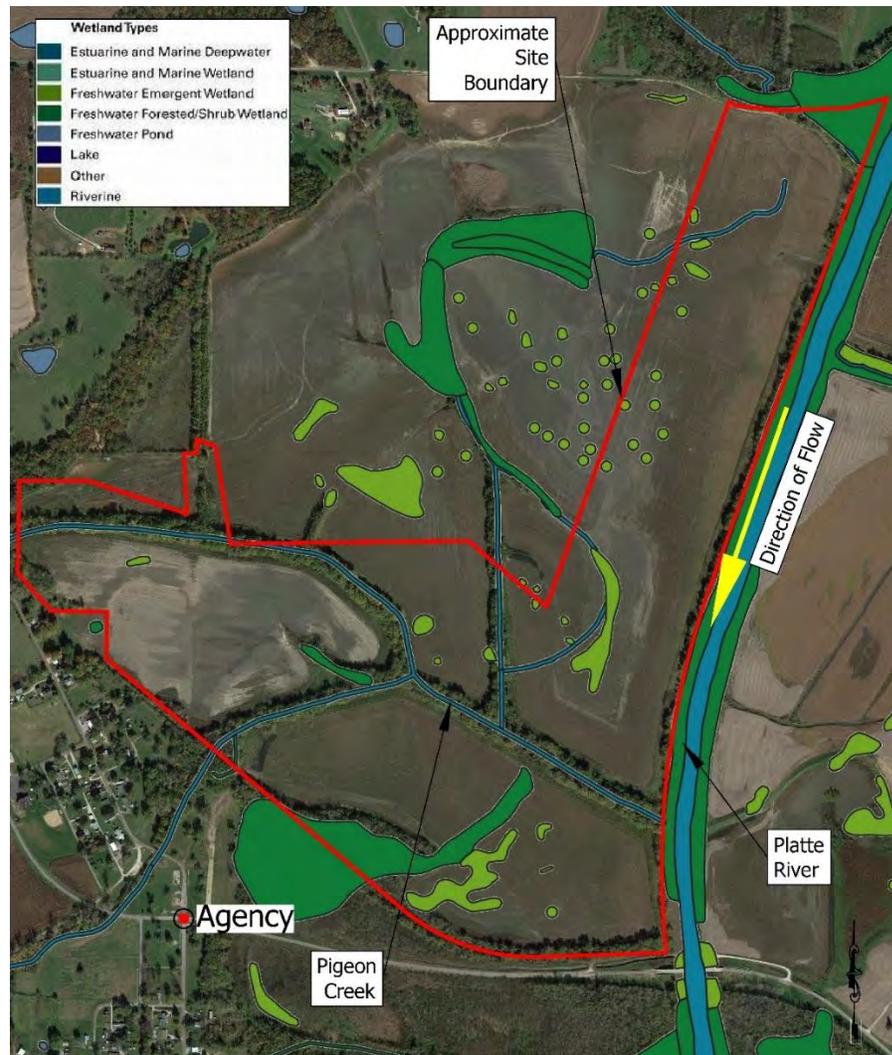
Map Unit Symbol	Map Unit Name	Hydric Rating	Soil Taxonomy
13514	Dockery silty clay loam, 0-2% slopes, occasionally flooded	5	Aquic Udifluvents
13563	Nodaway silt loam, 0-2% slopes, occasionally flooded	5	Mollic Udifluvents
13510	Colo silty clay loam, 0-2% slopes, occasionally flooded	90	Cumulic Endoaquolls
10155	Gosport silty clay loam, 15-45% slopes	0	Oxyaquic Dystrudepts
12508	Wiota silt loam, 1-3% slopes, rarely flooded	0	Pachic Argiudolls
36021	Kennebec silt loam, 0-2% slopes, rarely flooded	6	Cumulic Hapludolls

The U.S. Fish & Wildlife Service’s National Wetlands Inventory described numerous wetlands on the Site, shown in Figure 7 (U.S. Fish & Wildlife Service, n.d.). Palustrine forested wetlands are shown along the bank of the Platte River, and in the forested areas in the northeast corner of the Site, in the center of the row crop field north of Pigeon Creek, along Ephemeral #6, and though the field south of Pigeon Creek and southeast of Perennial



#3 and into Wetland #17. Multiple palustrine emergent wetlands are mapped across the row crop fields, especially north of Pigeon Creek.

Figure 7. National Wetlands Inventory Map



On March 20th, 2017, scientists with Terra Technologies completed a Wetland Delineation and Jurisdictional Assessment of the Site to identify, delineate, and map the locations of wetlands, waterways, and other water bodies and to otherwise document existing site conditions. The delineation of streams was conducted through the inspection and characterization of channel characteristics, including a defined bed and bank and the presence of an ordinary high water mark. Wetland delineation was performed according to the methods and procedures described in the Corps' *Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (U.S. Army Corps of Engineers, 2010). The presence of wetlands was ascertained by the observation of all three delineative criteria: 1) a predominance of hydrophytic plant species, 2) hydric soil



indicators and 3) wetland hydrology indicators. The Site's wetland boundaries are shown below in Figure 8 and a brief description of each wetland is included in Table 2.

The boundary used for the Wetland Delineation and Jurisdictional Assessment was the boundary of all contiguous properties under consideration for purchase. The Site boundaries are smaller. To alleviate any confusion, the numbering and extent of streams and wetlands used in the Wetland Delineation and Jurisdictional Assessment are retained here despite the Site boundaries being smaller and excluding some or all of certain wetlands and streams. Consequently, Wetlands #1, 11, and 12, which lie completely outside the Site, are shown on Figure 8 but not described in this report. Wetlands #2, 3, 5, 9, 13, and 17 are partially outside the Site. Figure 8 shows the total acreage of the delineated wetland and Table 2 shows the acreage of the wetland within the Site.

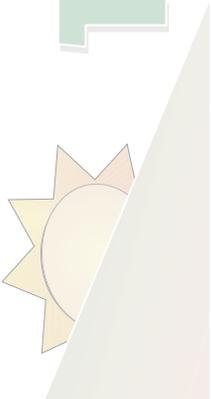


Figure 8. Existing Wetland Boundaries

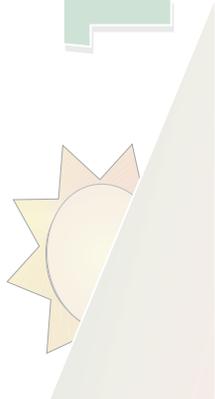
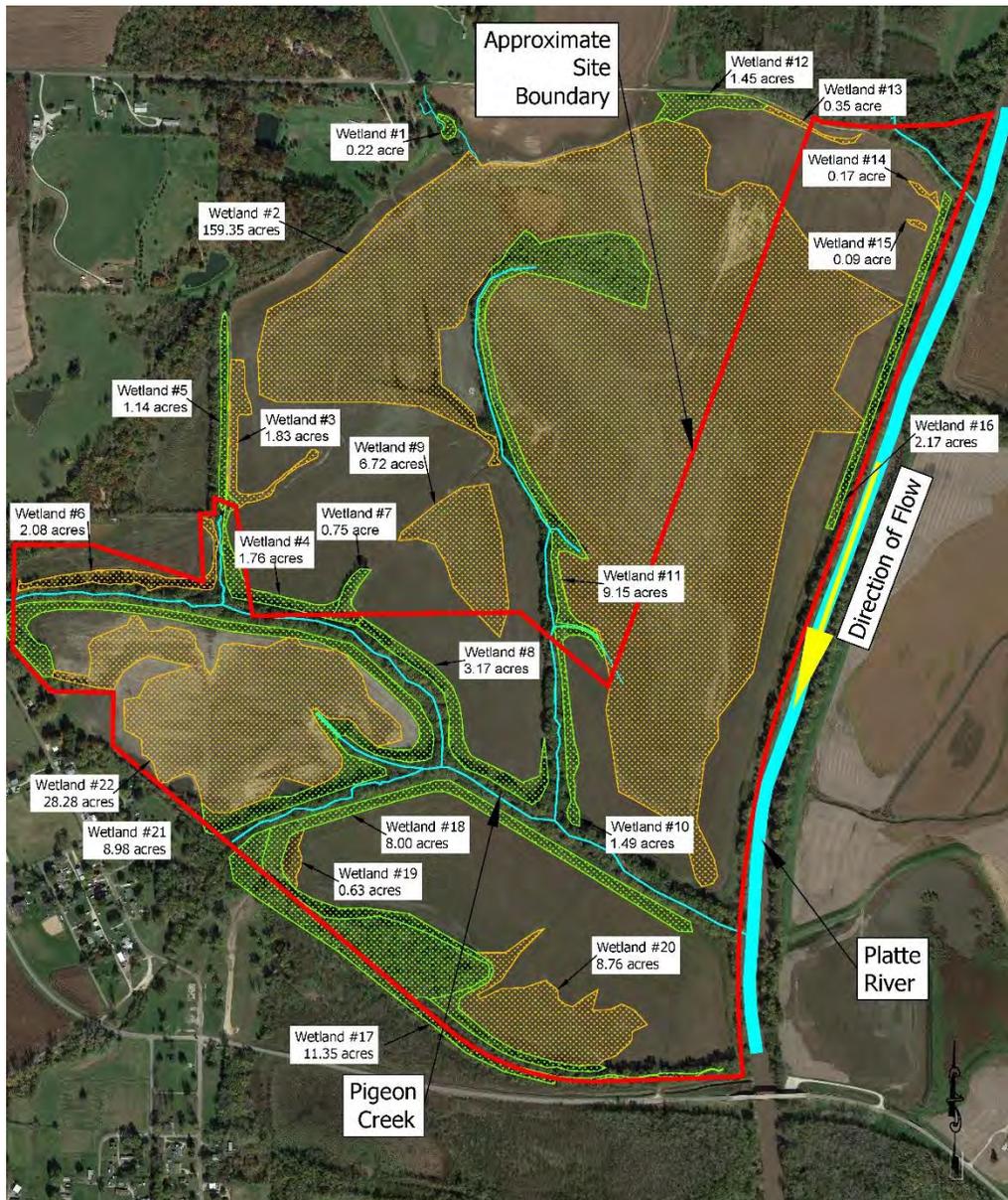


Table 2. Wetland Baseline Conditions Summary

Wetland #	Size (Acres)	Wetland Type	Dominant Vegetation	Wetland Hydrology Indicators	Hydric Soil Indicators	Primary Impairments	Proposed Modifications
1	Delineated outside Site boundary						
2	57.39	Farmed	Row Crops	Saturation, Saturation visible on aerial imagery, Geomorphic position	Redox dark surface	Farming disturbance, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting
3	Delineated outside Site boundary						
4	0.89	Scrub-shrub	Black willow (<i>Salix nigra</i>), Scouring rush (<i>Equisetum hyemale</i>), Pennsylvania smartweed (<i>Persicaria pensylvanica</i>)	Geomorphic position, FAC-neutral test	Redox dark surface	Low plant community quality/diversity	<u>Riparian Restoration:</u> Seeding and planting
5	0.03	Forested	Silver maple (<i>Acer saccharinum</i>), Eastern cottonwood (<i>Populus deltoides</i>), Black willow (<i>Salix nigra</i>), Roughleaf dogwood (<i>Cornus drummondii</i>)	Sparsely vegetated concave surface, drainage patterns, FAC-neutral test	Depleted Below Dark Surface, Depleted Matrix	Small size, Low plant community quality/diversity	<u>Riparian Restoration:</u> Seeding and planting
6	2.06	Farmed	Row Crops	Saturation visible on aerial imagery, Geomorphic position,	Depleted Matrix	Farming disturbance, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting
7	0.19	Forested	Eastern cottonwood (<i>Populus deltoides</i>), American elm (<i>Ulmus americana</i>), Black willow (<i>Salix nigra</i>)	Geomorphic position, FAC-neutral test	Redox dark surface, Redox depressions	Small size, Low plant community quality/diversity	<u>Riparian Restoration:</u> Seeding and planting
8	3.17	Scrub-shrub	Silver maple (<i>Acer saccharinum</i>), Scouring rush (<i>Equisetum hyemale</i>)	Geomorphic position, FAC-neutral test	Redox dark surface, Redox depressions	Low plant community quality/diversity, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting
9	0.32	Farmed	Row Crops	Saturation visible on aerial imagery, Geomorphic position,	Redox dark surface	Farming disturbance, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting



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Wetland #	Size (Acres)	Wetland Type	Dominant Vegetation	Wetland Hydrology Indicators	Hydric Soil Indicators	Primary Impairments	Proposed Modifications
10	1.12	Scrub-shrub	Silver maple (<i>Acer saccharinum</i>), Scouring rush (<i>Equisetum hyemale</i>), Mild water-pepper (<i>Persicaria hydropiper</i>)	Drainage patterns, FAC-neutral test, Geomorphic position	Depleted matrix	Low plant community quality/diversity	<u>Riparian Restoration:</u> Seeding and planting
11	Delineated outside Site boundary						
12	Delineated outside Site boundary						
13	0.15	Farmed	Row Crops	Surface soil cracks, drainage patterns, Geomorphic position	Depleted matrix	Farming disturbance, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting
14	0.17	Farmed	Row Crops	Drift deposits, Geomorphic position	Depleted matrix	Farming disturbance, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting
15	0.09	Farmed	Row Crops	Drift deposits, Surface soil cracks, Geomorphic position	Redox dark surface	Farming disturbance, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting
16	2.17	Scrub-shrub	Silver maple (<i>Acer saccharinum</i>), Mild water-pepper (<i>Persicaria hydropiper</i>), Fall panicgrass (<i>Panicum dichotomiflorum</i>)	Drift deposits, FAC-neutral test, Geomorphic position	Redox dark surface	Low plant community quality/diversity	<u>Riparian Restoration:</u> Seeding and planting
17	6.85	Forested	Silver maple (<i>Acer saccharinum</i>), Black willow (<i>Salix nigra</i>), Reed canarygrass (<i>Phalaris arundinacea</i>), Woodsedge (<i>Carex blanda</i>)	Drift deposits, FAC-neutral test, Geomorphic position	Redox dark surface	Invasive species, Lack of buffers	<u>Wetland Enhancement:</u> Invasive species removal, Seeding and/or planting



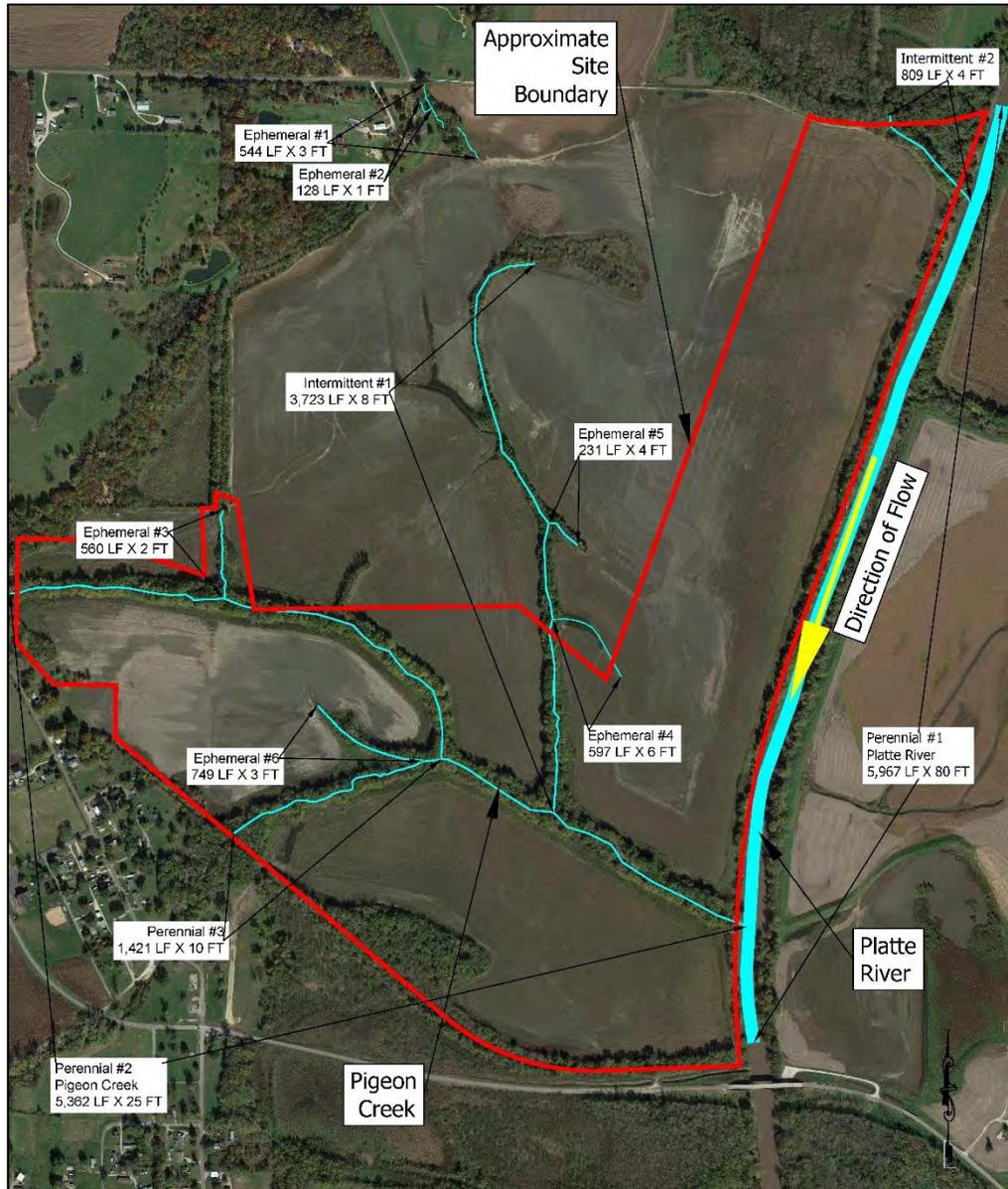
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Wetland #	Size (Acres)	Wetland Type	Dominant Vegetation	Wetland Hydrology Indicators	Hydric Soil Indicators	Primary Impairments	Proposed Modifications
18	8.00	Scrub-shrub	Silver maple (<i>Acer saccharinum</i>), Black willow (<i>Salix nigra</i>), Eastern cottonwood (<i>Populus deltoides</i>), Mild water-pepper (<i>Persicaria hydropiper</i>), Reed canarygrass (<i>Phalaris arundinacea</i>)	FAC-neutral test, geomorphic position	Redox dark surface	Invasive species, Lack of buffers	<u>Wetland Enhancement:</u> Invasive species removal, Seeding and/or planting
19	0.63	Farmed	Row Crops	Drainage patterns, Geomorphic position	Redox dark surface	Farming disturbance, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting
20	8.76	Farmed	Row crops	Surface soils cracks, Saturation visible on aerial imagery, Geomorphic position	Redox dark surface	Farming disturbance, Lack of buffers	<u>Western Portion: Wetland Restoration:</u> Earthwork, seeding and/or planting <u>Eastern Portion: Riparian Restoration:</u> Seeding and planting
21	8.77	Scrub-shrub	Silver maple (<i>Acer saccharinum</i>), shoreline sedge (<i>Carex hyalinolepis</i>), Virginia wildrye (<i>Elymus virginicus</i>), Scouring rush (<i>Equisetum hyemale</i>)	FAC-neutral test, Geomorphic position	Redox dark surface	Lack of buffer, Adjacent farming disturbance	<u>Riparian Restoration:</u> Seeding and planting
22	28.28	Farmed	Row crops	Surface soils cracks, Crayfish burrows, Saturation visible on aerial imagery, Geomorphic position	Redox dark surface	Farming disturbance, Lack of buffers	<u>Riparian Restoration:</u> Seeding and planting

There were eleven streams identified within the Site and the property to the north: three perennial streams (the Platte River, Pigeon Creek, and Perennial #3), two intermittent streams, and six ephemeral streams. The streams are depicted in Figure 9 and described in Table 3.

Figure 9. Existing Stream Limits



Baseline stream characteristics are summarized in Table 3, where the stated lengths reflect the distance each stream travels within the Site boundary. Also included in Table 3 are the Rosgen stream type and Schumm Channel Evolution Model Stage for each stream (Schumm *et al.*, 1984; Rosgen, 1996).



Table 3. Stream Baseline Conditions Summary

Stream	Length (Linear Feet)	Average Width at Ordinary High Water Mark	Approximate Drainage Area (Acres)	Rosgen Stream Type (Rosgen, 1996)	Schumm Channel Evolution Model Stage	Primary Impairment(s)
Platte River (Perennial #1)	5,967	80	1,140,140	E6 (but locally channelized)	III (Widening)	Channelization, Incision, Bank erosion, Thin riparian buffer
Pigeon Creek (Perennial #2)	5,250	25	9,000	G6	III (Widening)	Channelization, Incision, Bank erosion, Thin riparian buffer
Perennial #3	1,421	10	2,070	G6	III (Widening)	Channelization, Incision, Bank erosion, Thin riparian buffer
Intermittent #1	1,124	8	413	Former Path of Platte River: Fits No Classification	III (Widening)	Channelization, Incision, Bank erosion, Thin riparian buffer
Intermittent #2	579	4	854	G6	III (Widening)	Incision, Bank erosion
Ephemeral #1	Delineated outside Site boundary					
Ephemeral #2	Delineated outside Site boundary					
Ephemeral #3	560	3	35	G6	II (Incision)	Incision, Bank erosion
Ephemeral #4	105	6	2	G6	II (Incision)	Incision, Bank erosion
Ephemeral #5	Delineated outside Site boundary					
Ephemeral #6	749	3	98	G6	II (Incision)	Incision, Bank erosion

Information on the baseline pre-mitigation vegetation present within the Site was collected in the process of completing the Wetland Delineation and Jurisdictional Assessment. This information was used to categorize the existing vegetation into five roughly defined plant communities with approximate limits as shown in Figure 10. The dominant and common plant species in each plant community are listed below in Table 4. The riparian forests within the Site were classified as Riverfront Forest, following the convention of *The Terrestrial Natural Communities of Missouri* (Nelson, 2005). It should be noted, however, that the forests on the Site had relatively few of some of the tree species listed as dominant in this forest community including green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), river birch (*Betula nigra*),



hackberry (*Celtis occidentalis*), and silky dogwood (*Cornus amomum*). Also missing from the Riverfront Forest are the characteristic trees bur oak (*Quercus macrocarpa*) and shellbark hickory (*Carya laciniosa*). Information on the plant communities appropriate to the Site will be utilized in preparing the planting and seeding lists.

Figure 10. Existing Plant Communities

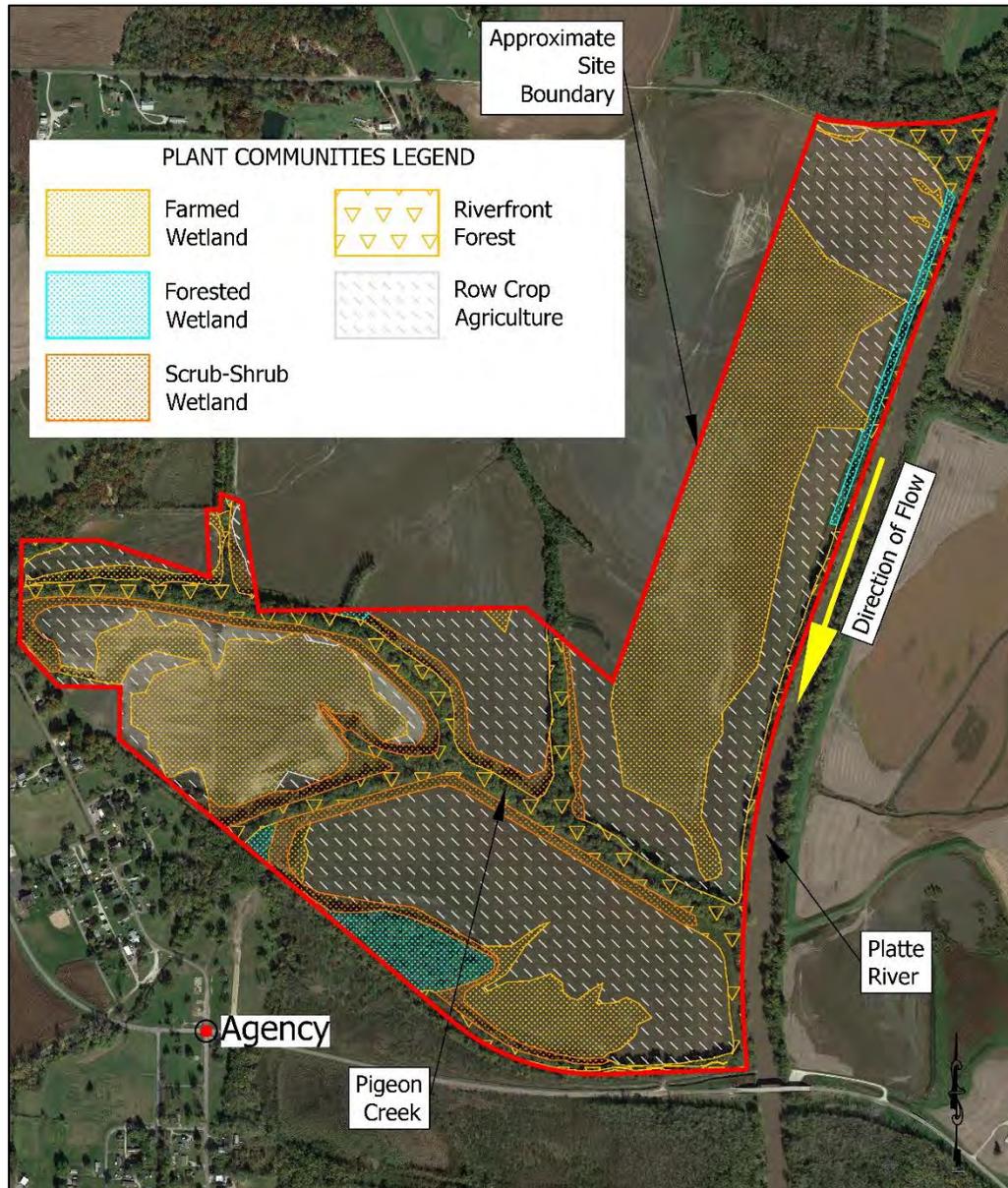
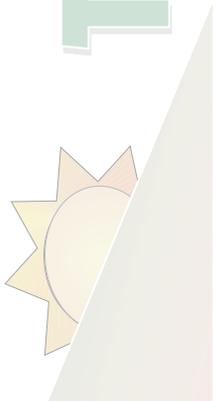


Table 4. Baseline Plant Community Descriptions

Plant Community Name	Dominant Species	Common Species
Row Crop Agriculture	Agricultural commodity species	None
Farmed Wetland	Agricultural commodity species	None
Scrub-Shrub Wetland	Silver maple (<i>Acer saccharinum</i>) Reed canarygrass (<i>Phalaris arundinacea</i>)	Black willow (<i>Salix nigra</i>) Cottonwood (<i>Populus deltoides</i>) Scouring rush (<i>Equisetum hyemale</i>)
Forested Wetland	Silver maple (<i>Acer saccharinum</i>) Eastern cottonwood (<i>Populus deltoides</i>) Virginia wildrye (<i>Elymus virginicus</i>) Mild water-pepper (<i>Persicaria hydropiper</i>)	Black willow (<i>Salix nigra</i>) Roughleaf dogwood (<i>Cornus drummondii</i>) Woodsedge (<i>Carex blanda</i>) Fall panicgrass (<i>Panicum dichotomiflorum</i>)
Riverfront Forest	Silver maple (<i>Acer saccharinum</i>) Cottonwood (<i>Populus deltoides</i>) Reed canarygrass (<i>Phalaris arundinacea</i>) Virginia wildrye (<i>Elymus virginicus</i>)	Box elder (<i>Acer negundo</i>) White mulberry (<i>Morus alba</i>) Wild garlic (<i>Allium canadense</i>) Heath aster (<i>Symphotrichum ericoides</i>) Scouring rush (<i>Equisetum hyemale</i>)

Based on the extent of the baseline plant communities as described above, the current land uses on the Site are as follows: 77% row crop agriculture and 23% forest and scrub-shrub areas.

Despite the generally degraded nature of the upland, wetland, and stream habitats on the Site, none of the impairments are so severe that they cannot be reversed or at least substantially improved. In fact, the moderately degraded nature of the Site makes it a highly desirable location for wetland, stream, and riparian buffer mitigation.



V. DETERMINATION OF CREDITS

A. Wetland Credits

The total number of wetland credits that will be generated by the Site's mitigation actions was determined by using the State of Missouri Wetland Mitigation Method (U.S. Army Corps of Engineers, 2017). The credit worksheets are included in this document as Table 5 and Table 6. As shown in those tables and in the Mitigation Plan Figures in Appendix C, the wetland mitigation activities that would generate these credits include the restoration and enhancement of emergent, forested, and scrub-shrub wetlands in the southern section of the Site as well as the incorporation of one Wetland Buffer area.

Upon approval of this document, the Corps, in consultation with the IRT, will grant the Bank the quantity of wetland credits achieved. Those wetland credits will be released as described in the credit release schedule included in Section V.B (Credit Release Schedule) of the Bank's umbrella mitigation banking instrument.

Please note that the Site wetlands are granted secondary priority area status because they are adjacent to the Platte River which is listed as a Category 5 water in the current Clean Water Act Section 305(b) Integrated List for *E. coli* contamination (Missouri Department of Natural Resources, 2016), an impairment which can be improved by wetlands (Reinoso, Torres & Bécars, 2008 & Stottmeister *et al.*, 2003). Additionally, the proposed wetland mitigation areas were given Category 1 status for the Kind factor because these areas address some of the needs of the watershed as stated in the watershed approach (Section II of the Bank's Final Mitigation Banking Instrument), including good site selection, restoration of some of the most historically common wetland types, mitigation along a river whose water quality is degraded by an impairment that wetlands can address, the ability to also remove sediment and nutrients, and the creation of wetlands as part of a large-scale habitat restoration project that will establish a significant amount of interior habitat. Finally, for the calculation of the wetland buffer mitigation area in Table 6, the wetland buffer area encompasses 60% of the external wetland border for the vast majority of the wetlands in the southern portion of the Site. Therefore, the wetland buffer mitigation area was determined by multiplying the actual acreage of the wetland buffer area by a factor of 0.60.

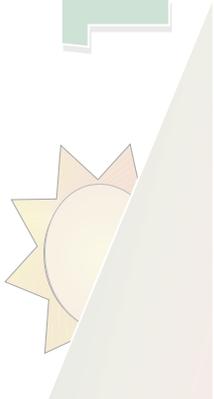


Table 5. Restoration Table – Mitigation Factors for Wetlands - Credits

Factors	Options				
	Aquatic Resource Type	Type C 0.2	Type B 0.4		
Priority Category	Tertiary 0	Secondary 0.5		Primary 1.0	
Control	Corps approved site protection without third party grantee 1.0		Corps approved site protection recorded with an approved third party grantee, or transfer of title to a conservancy 2.0		
Temporal Loss	>20 Years -0.3	10-20 Years -0.2	5-10 Years -0.1		0-5 Years 0
Credit Schedule	Schedule 3 0.2		Schedule 2 0.4		Schedule 1 0.6
Kind	Category 5 -0.1	Category 4 0	Category 3 0.2	Category 2 0.4	Category 1 0.8
*Location	Location 5 0	Location 4 0.1	Location 3 0.3	Location 2 0.4	Location 1 0.8
Vegetation	**N.A. 0	Natural 0.1			Planted 0.2

*Location Factor only applies to permittee-responsible mitigation

**N.A. = Not Applicable

Proposed Restoration Mitigation Sample Worksheet - Credits

Factor	Area 1	Area 2	Area 3	Area 4	Area 5
Area Name	Emergent Wetland Restoration Area				
Aquatic Resource Type	0.4				
Priority Category	0.5				
Control	2.0				
Temporal Loss	0				
Credit Schedule	0.6				
Kind	0.8				
Location	--				
Vegetation	0.2				
Sum of Factors(M)	4.5				
Mitigation Area(A)	14.45				
M x A=	65.03				
TOTAL RESTORATION CREDITS = Σ M x A				65.03	

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Table 6. Enhancement Table – Mitigation Factors For Wetlands - Credits

Factors	Options				
	Aquatic Resource Type	*Upland Buffer 0.05	Type C 0.1	Type B 0.2	Type A 0.4
Priority Category	Tertiary 0		Secondary 0.3		Primary 0.6
Control	Corps approved site protection without third party grantee 0.5			Corps approved site protection record with and approved third party grantee, or transfer of title to a conservancy 1.0	
Temporal Loss	*N/A 0	>20 Years -0.3	10-20 Years -0.2	5-10 Years -0.1	0-5 Years 0
Credit Schedule	Schedule 3 0.1		Schedule 2 0.3		Schedule 1 0.5
Kind	Category 5 -0.1	Category 4 0	Category 3 0.1	Category 2 0.2	Category 1 0.5
**Location	Location 5 -0.1	Location 4 0	Location 3 0.1	Location 2 0.3	Location 1 0.4
Vegetation	***N.A. 0		Natural 0		Planted 0.1

*The upland buffer cannot exceed more than twice the size of the mitigation site it is enhancing

**Location Factor only applies to permittee-responsible mitigation

***N.A. = Not applicable

Proposed Enhancement Mitigation Sample Worksheet – Credits

Factor	Area 1	Area 2	Area 3	Area 4	Area 5
Area Name	Forested Wetland Enhancement Areas	Scrub-Shrub Wetland Enhancement Area	Wetland Buffer Area		
Aquatic Resource	0.4	0.2	0.05		
Priority Category	0.3	0.3	0.3		
Control	1.0	1.0	1.0		
Temporal Loss	0	0	0		
Credit Schedule	0.5	0.5	0.5		
Kind	0.5	0.5	0.5		
Location	--	--	--		
Vegetation	0.1	0.1	0		
Sum of Factors(M)	2.8	2.6	2.35		
Mitigation Area(A)	6.33	2.39	0.80 (1.33 x 0.6)		
M × A=	17.72	6.21	1.88		
TOTAL RESTORATION/ENHANCEMENT CREDITS = Σ M x A				25.81	

Total Wetland Credits (Restoration and Enhancement): 90.84

B. Stream Credits

The total number of stream credits that will be generated by the Site's mitigation actions was determined by using the In-Stream Worksheet and the Riparian Buffer Worksheet from the State of Missouri Stream Mitigation Method (U.S. Army Corps of Engineers, *et al.*,



2013). These worksheets are included in this document as Table 8 and Table 9. Upon approval of this document, the Corps, in consultation with the IRT, will grant the Bank the quantity of stream credits achieved. Those stream credits will be released as described in the credit release schedule included in Section V.B (Credit Release Schedule) of the Bank's umbrella mitigation banking instrument.

Please note that the Platte River is granted primary priority area status as was done for the nearby approved Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 1 - Castile Creek. Not only is the Platte River the largest waterway in its 8-digit Hydrologic Unit Code, it is the most significant Missouri River tributary in the entire Nishnabotna/Platte EDU. Also, the Platte River is highly impacted throughout much of its length within Missouri as shown by the Missouri Resource Assessment Partnership's Human Stressor Index scores (Sowa *et al.*, 2005). As such, mitigation along the Platte River in the vicinity of the Site should be encouraged. For these reasons the Platte River is scored as having primary priority status and all net benefit areas within 1.0 mile upstream of the Platte River qualify for secondary priority status (Net Benefits 2, 2A, 3, and 3A).

Riparian mitigation will be accomplished as shown in the Mitigation Plan Figures in Appendix C and as described in Table 7 and Section VI (Mitigation Work Plan). Please note that as shown in Figure 5, the Federal Emergency Management Agency's regulatory floodway extends well beyond the limits of the proposed Platte River riparian buffer (Net Benefit 1). The regulatory floodway is the innermost, most active, and most hydraulically critical portion of the floodplain. As a result, the regulatory floodway is clearly riparian in terms of its hydrology, landform, and vegetation. Therefore, it is logical for the Platte River riparian buffer to extend to the Site boundary within the northeastern portion of the Site, an average width of 1,000 feet which is only about half of the width of the floodway on this side of the Platte River. Similarly, the width of the Pigeon Creek riparian buffers slightly exceeds the typical 300-foot width in order to be roughly proportionate to the average width of the regulatory floodway along the length of Pigeon Creek on the Site. In consequence, the Large River Riparian Buffer Net Benefit Values from Table 3 in the Bank's umbrella mitigation banking instrument will be applied for Net Benefits 1 and 2 (the riparian buffers of the Platte River and Pigeon Creek). This is appropriate because the flooding of these areas is expected to be common and to extend significantly beyond the typical 300-foot limit of riparian stream credit creation. Additionally, these expanded riparian widths will capture sediment that could travel elsewhere on the Site and downstream. Not only will the high frequency and significant breadth of riparian flooding cause these riparian areas to provide a greater than average amount of ecosystem function, the pre-settlement riparian buffers were historically wide in this area as shown by the naturally expansive floodplains along much of the length of the Platte River. Two reference locations exist in the immediate vicinity of the Site that support the proposed Platte River riparian width. Natural riparian buffer widths exist from 0.1 to about 2.0 miles upstream of the Missouri Highway 116 bridge that are of significant size. While their width varies, they very frequently exceed



600 feet in width. Similarly, 0.5 to 2.0 miles downstream of the Platte River's confluence with Castile Creek, riparian buffers averaging about 2,000 feet in width exist on the right descending bank of the Platte River.

As described in more detail in the Mitigation Work Plan in Section VI, there are three proposed in-stream mitigation activities on the Site: 1) stream channel restoration of Pigeon Creek, 2) stream channel restoration of Perennial #3, and 3) stream channel restoration of Ephemeral #3. These proposed mitigation activities and the rest of the mitigation activities associated with each Net Benefit area are described below in Table 7 and Figure 11.

Table 7. Net Benefit Area Descriptions

Net Benefit Area	Location / Description	Average Riparian Width (Feet)
1	<i>Riparian</i> : Riparian Buffer Restoration along the right descending bank of the Platte River for 5,967 lineal feet	1,000 (Right Descending Bank)
2	<i>Riparian</i> : Riparian Buffer Restoration along both banks of Pigeon Creek for 5,482 lineal feet	395 (Right Descending Bank) 339 (Left Descending Bank)
2A	<i>In-Stream</i> : Stream Channel Restoration of Pigeon Creek for 8,204 lineal feet.	Not Applicable
3	<i>Riparian</i> : Riparian Buffer Restoration along both banks of Perennial #3 for 1,955 lineal feet	300 (Right Descending Bank) 200 (Left Descending Bank)
3A	<i>In-Stream</i> : Stream Channel Restoration of Perennial #3 for 2,714 lineal feet.	Not Applicable
4	<i>Riparian</i> : Riparian Buffer Restoration along both banks of Ephemeral #3 for 719 lineal feet	100 (Both Banks)
4A	<i>In-Stream</i> : Stream Channel Restoration of Ephemeral #3 for 1,342 lineal feet.	Not Applicable

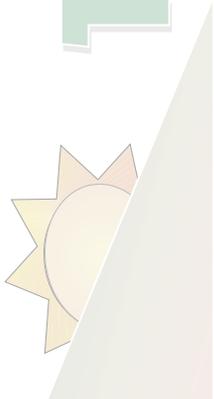
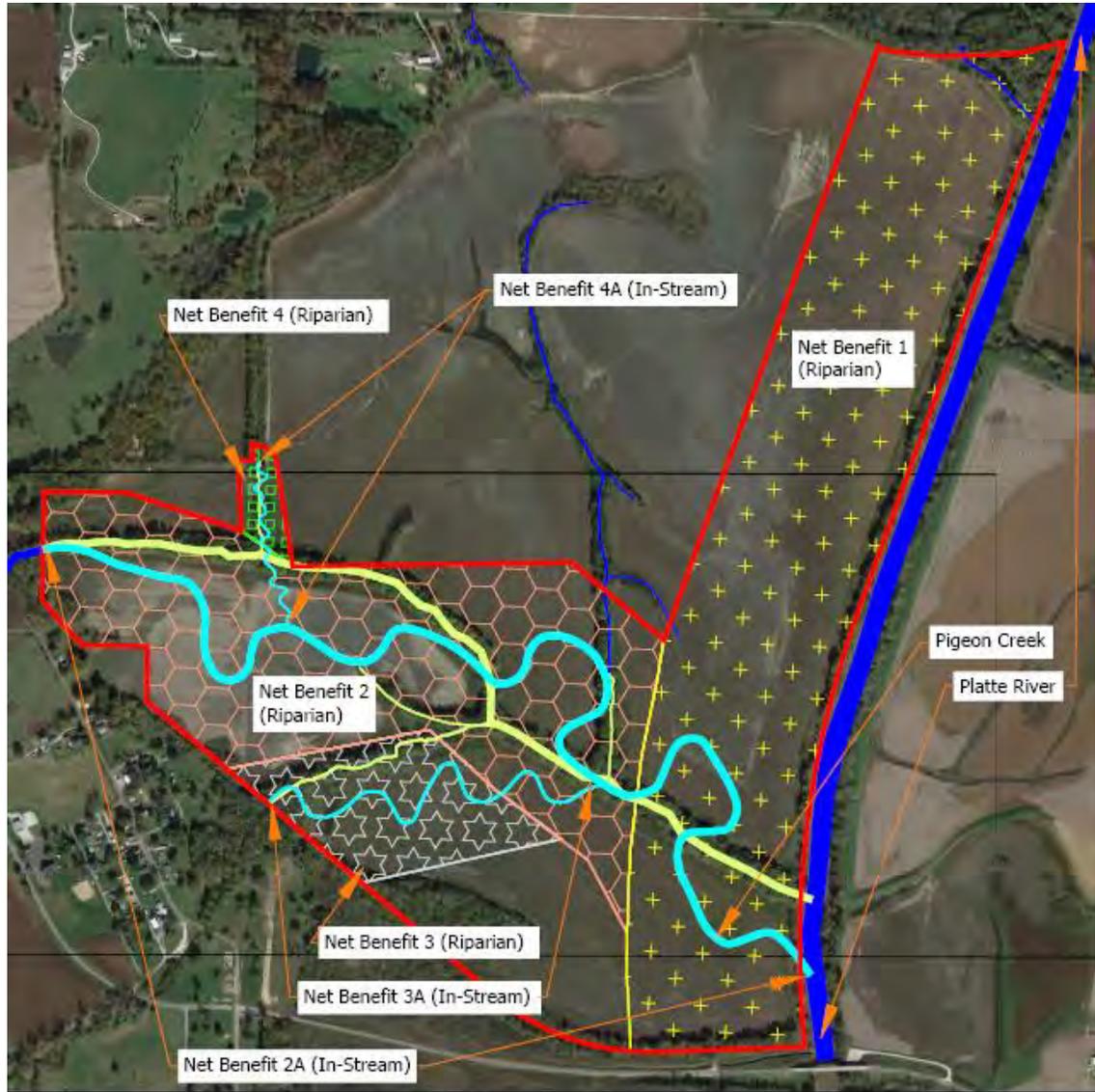
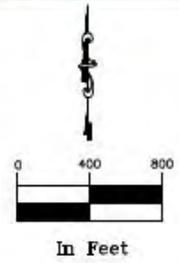


Figure 11. Net Benefit Areas



-  **Site Boundary**
-  **Existing Stream Channel Not To Be Disturbed**
-  **Stream Channel Restoration**
-  **Existing Stream Channel To Be Filled**



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Table 8. 2013 State of Missouri Stream Mitigation Method

In-Stream Worksheet

Stream Type	Ephemeral 0.15	Intermittent 0.2	Perennial 0.4	
Priority Waters	Tertiary 0.05	Secondary 0.2	Primary 0.4	
Net Benefit	Stream Relocation to Accommodate Authorized Project 0.5	Moderate 1.2	Good 2.4	Excellent 3.5
Site Protection	Corps approved site protection without third party grantee 0.1	Corps approved site protection recorded with third party grantee, or transfer of title to a conservancy 0.4		
Credit Schedule	Schedule 1 0.3	Schedule 2 0.1	Schedule 3 0	

Factors	Net Benefit 2A	Net Benefit 3A	Net Benefit 4A
Stream Type	0.4	0.4	0.15
Priority Waters	0.2	0.2	0.05
Net Benefit	3.5	3.5	3.5
Site Protection	0.4	0.4	0.4
Credit Schedule	0.3	0.3	0.3
Sum of Factors (M)=	4.8	4.8	4.4
Stream Length Benefited (do not count each bank separately or count same channel reach twice) (LF)	8,204	2,714	1,342
Credits (C) = M X LF	39,379.20	13,027.20	5,904.80
Location and Kind Factor (LK)	1		

In-Stream Credits Generated from all Columns = 58,311.20



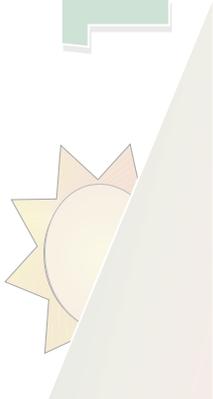
**Table 9. 2013 State of Missouri Stream Mitigation Method:
Riparian Buffer Worksheet**

Stream Type	Ephemeral 0.15	Intermittent 0.2	Perennial 0.4	
Priority Waters	Tertiary 0.05	Secondary 0.2	Primary 0.4	
Net Benefit (for each side of stream)	Riparian Restoration/Establishment, Enhancement, and Preservation Factors (select values from Table 1) (also see Minimum Buffer Width (MBW) page 15)			
Supplemental Buffer Credit	Condition: Buffer established, enhanced or preserved on both streambanks To calculate: (Net Benefit Stream Side A + Net Benefit Stream Side B) / 2			
Site Protection	Corps approved site protection without third party grantee 0.05	Corps approved site protection recorded with third party grantee, or transfer of title to a conservancy 0.2		
Credit Schedule	Schedule 1 0.15	Schedule 2 0.05	Schedule 3 0	
Temporal Lag (Years)	Over 20 -0.3	10 to 20 -0.2	5 to 10 -0.1	0 to 5 0

Factors		Net Benefit 1	Net Benefit 2	Net Benefit 3	Net Benefit 4
Stream Type		0.4	0.4	0.4	0.15
Priority Waters		0.4	0.2	0.2	0.05
Net Benefit	Stream Side A (RDB)	10.00	3.75	1.10	0.70
	Stream Side B (LDB)	0	3.25	0.90	0.70
Supplemental Buffer Credit (Buffer on Both Sides)		0	3.50	1.00	0.70
Site Protection		0.2	0.2	0.2	0.2
Credit Schedule	Stream Side A (RDB)	0.15	0.15	0.15	0.15
	Stream Side B (LDB)	0	0.15	0.15	0.15
Temporal Lag		0	0	0	0
Sum of Factors (M) =		11.15	11.60	4.10	2.80
Stream Length Buffered (LF) = (do not count each bank separately or count same channel twice)		5,967	5,482	1,955	719
Credits (C) = M X LF		66,532.05	63,591.20	8,015.50	2,013.20
Location and Kind Factor (LK)		1.00			

Riparian Credits Generated from all Columns = 140,151.95

Total Stream Credits Generated (In-Stream + Riparian Buffer) = 198,463.15



VI. MITIGATION WORK PLAN

All work for this project will take place within the boundaries of the Site as shown in Appendix C. Deviation from the approved Mitigation Plan Figures is subject to review and written approval by the Corps, in consultation with the IRT.

Wetland Mitigation

Wetland Restoration

Earthwork will be necessary in the southern part of the Site to spread hydrology and wetland conditions across a larger area than currently exists. A grading plan will be included in the Site's Final Mitigation Plan after the Sponsor has been able to hear feedback from the Corps and IRT. Wetland areas will be seeded and/or planted with a diverse blend of native species as included in the Mitigation Plan Figures.

Wetland Enhancement

Forested Wetland #17 and scrub-shrub Wetland #18 are impaired by invasive reed canarygrass and a lack of species diversity. Consequently, the segments of these wetlands within the Site will be enhanced by eradicating the reed canarygrass and by the installation of species on the Wetland Enhancement Planting List and the Seeding List: Wetlands.

Wetland Buffers

As described in more detail earlier in this document, wetland buffers will provide some protection from adverse surrounding land uses and will enhance the hydrological and ecological functioning of the adjacent aquatic resources. The one Wetland Buffer area on the Site is a currently wooded area that will have all existing individuals of species on the Invasive Species and Undesirable Species list removed.

Stream Mitigation

The impairments identified in the stream assessment process were considered in the context of *A Function-Based Framework for Stream Assessment and Restoration Projects* (Harman *et al.*, 2012) and the proposed mitigation activities were selected to provide the most functional improvement possible given the project's constraints. The assessment of the onsite streams identified the following primary impairments that will be directly addressed by the Site's mitigation activities: past channelization of Pigeon Creek, Perennial #3, and Ephemeral #3, and insufficient riparian buffer width across the Site.



In-Stream Mitigation

The planned in-stream mitigation activities include the following:

- Stream channel restoration of Pigeon Creek
- Stream channel restoration of Perennial #3
- Stream channel restoration of Ephemeral #3

These three previously channelized streams will be restored to natural sinuous courses with appropriate channel cross sections. The Mitigation Plan Figures in Appendix C show the alignments of these streams and final design details will be included in the Site's Final Mitigation Plan. The proposed alignments were created using the wavelengths of unchannelized portions of the Platte River, Pigeon Creek, and Perennial #3 as local reference reaches that were scaled to the design bankfull widths of the three streams which were computed from recently developed regional curves. The regional curves used are specific not only to the physiographic province where the Site is located (the Interior Plains: Central Lowlands) but also to the local U.S. Geological Survey Hydrologic Landscape Region (humid plateaus with impermeable soils and bedrock). Hydrologic Landscape Regions are geographic subdivisions of hydrologically similar areas based on climate, geology, and landform (Blackburn-Lynch *et al.*, 2017).

Riffles and pools will self-establish in the restored stream beds as a result of natural stream processes. Grade control structures that will mimic natural riffles will be placed at the downstream portion of each stream to minimize the likelihood of future incision. The typical details of these grade control structures are shown in Appendix C.

Riparian Buffer Mitigation

Currently unforested Riparian Buffer Restoration areas will be improved through the seeding of appropriate herbaceous native species and the planting of bare root seedling trees and shrubs. Because roughly half of bare root seedlings are not expected to survive, the 218 seedlings per acre planting density is expected to achieve an eventual tree and shrub density of 109 seedlings per acre (20-foot spacing to coincide with a 100% replanting rate in those areas). Trees and shrubs will not be planted within riparian buffer areas that are planned to contain emergent wetland riparian conditions (small riparian areas adjacent to emergent wetland restoration areas). The riparian planting areas are also adjacent to a significant amount of existing riparian plant communities. The dominant vegetation in those areas will likely contribute a seed source in to the planted riparian areas. These planted riparian areas will be maintained by utilizing such management techniques as selective thinning and prescribed burning if feasible.



Planting and Seeding Lists

The Site will be planted with a diverse mixture of native wetland, forest, and prairie plants after earthwork is completed. The former agricultural areas of the Site will be seeded with native seed blends appropriate for either upland or wetland habitats. Bare root seedling tree and shrub plantings will be used within the specified riparian buffer planting areas. All planted or seeded vegetation will be from local ecotype sources as close as practical to the Site.

Herbaceous and tree species lists are included in the Mitigation Plan Figures in Appendix C. Herbaceous species will be acquired in either deep cell plugs, 1- or 2-quart containers, or as seed. All plant stock will be acquired from a nursery specializing in native plants and will be installed by a qualified mitigation contractor.

The planting and seeding lists for the Site are included in Appendix C and were created based on some of the plant communities described in *The Terrestrial Natural Communities of Missouri* which was developed by the Missouri Natural Areas Committee to categorize the vegetative communities throughout the state (Nelson, 2005). Specifically, the planting list for currently unforested Riparian Buffer Restoration areas was modelled after the Riverfront Forest, Wet Bottomland Forest, and Wet-Mesic Bottomland Forest natural communities (multiple community types were used because the large size of those mitigation activity types will likely result in a diversity of habitats). Similarly, the Forested Enhancement Wetland planting list was designed with the Wet Bottomland Forest and Wet-Mesic Bottomland Forest natural communities in mind. The seeding list for all wetland areas was modelled after the Marsh, Prairie Swale, and Wet Bottomland Prairie community types. Finally, the seeding list for currently unforested Riparian Buffer Restoration areas was based on the Riverfront Forest, Wet-Mesic Bottomland Forest, Wet Bottomland Prairie, Wet-Mesic Bottomland Prairie, and Mesic Loess/Glacial Till Prairie community types. The prairie community types were included because these areas will be full sun environments until the trees and shrubs reach sufficient size to provide shade which will allow the herbaceous species accustomed to forested environments to become established.

VII. OPERATION AND MAINTENANCE PLAN

The Site will follow the Bank's Operation and Maintenance Plan as described in the Bank's umbrella mitigation banking instrument.



VIII. ECOLOGICAL PERFORMANCE STANDARDS

The performance of the Site will be measured using the ecological performance standards listed below and described in detail in the Bank's umbrella mitigation banking instrument.

The Site will likely receive large and frequent inputs of invasive and undesirable species because of the expected high frequency of flooding from the Platte River (the elevation difference between the 1% annual chance flood water surface elevation and the Site surface is the same as at the Sponsor's nearby Castile Creek mitigation site). Consequently, the management of invasive and undesirable species will likely be a significant challenge and maintaining an invasive species cover less than 5% and a combined cover of 10% for all invasive and undesirable species may be unrealistic. For this reason, the Site's Invasive and Undesirable Species Cover performance standards are modified from the standard performance standard for the Bank because the maximum allowable amount of invasive species is 8% and the total allowable combined amount of invasive and undesirable species is 15%.

Wetland Credits:

Wetlands

- Wetland Hydrology
- Hydric Soils
- Hydrophytic Vegetation
- Desirable Vegetative Cover
- Tree and Shrub Survival (in areas that receive tree and/or shrub plantings)
- Invasive and Undesirable Species Cover
 - Site-specific modification: During the Operations and Maintenance phase of each mitigation site, invasive and undesirable species shall be controlled as follows. Species listed as invasive in Table 4 of the Bank's Umbrella Final Mitigation Banking Instrument will be eradicated upon observation and shall not, in the aggregate, cover more than 8% of the absolute cover of all wetland-credit-generating areas (*i.e.*, wetlands and wetland buffers). In addition, the combined absolute cover of species listed as invasive or undesirable in Table 4 of the Bank's Umbrella Final Mitigation Banking Instrument will not comprise more than 15% of all wetland-credit-generating areas.

Wetland Buffers

- Desirable Vegetative Cover
- Invasive and Undesirable Species Cover



- Site-specific modification: During the Operations and Maintenance phase of each mitigation site, invasive and undesirable species shall be controlled as follows. Species listed as invasive in Table 4 of the Bank's Umbrella Final Mitigation Banking Instrument will be eradicated upon observation and shall not, in the aggregate, cover more than 8% of the absolute cover of all wetland-credit-generating areas (*i.e.*, wetlands and wetland buffers). In addition, the combined absolute cover of species listed as invasive or undesirable in Table 4 of the Bank's Umbrella Final Mitigation Banking Instrument will not comprise more than 15% of all wetland-credit-generating areas.

Stream Credits:

Riparian Buffers

- Desirable Vegetative Cover
- Tree and Shrub Survival (in areas that are to receive tree and/or shrub plantings)
- Invasive and Undesirable Species Cover
 - Site-specific modification: During the Operations and Maintenance phase of each mitigation site, invasive and undesirable species shall be controlled as follows. Species listed as invasive in Table 4 of the Bank's Umbrella Final Mitigation Banking Instrument will be eradicated upon observation and shall not, in the aggregate, cover more than 8% of the absolute cover of all stream-credit-generating areas (*i.e.*, riparian buffers). In addition, the combined absolute cover of species listed as invasive or undesirable in Table 4 of the Bank's Umbrella Final Mitigation Banking Instrument will not comprise more than 15% of all stream-credit-generating areas.

Both upland and wetland habitats occur naturally in riparian landscape positions (Nelson, 2005). Consequently, Riparian Buffer Restoration areas will be allowed to have both wetland and upland habitats within their boundaries. Because there is unavoidable uncertainty about the final locations of any transitions between emergent wetland and forested conditions within the Site's Riparian Buffer Restoration areas, it is possible that some Riparian Buffer Restoration areas will meet all of their performance standards except Tree and Shrub Survival because the area surrounding the sample point has instead developed emergent wetland conditions. If this is the case, the failure to achieve the Tree and Shrub Survival performance standard in these riparian locations will not be cause to initiate default proceedings or to affect credit releases.

In-Stream Mitigation

- Stream Bank Stability (erosion less than 0.5 foot/year; documented with visual inspection and photographs, measured using bank pins), applicable to:



- Pigeon Creek stream channel restoration
- Perennial #3 stream channel restoration
- Ephemeral #3 stream channel restoration
- Floodplain Connectivity (Bank Height Ratio between 1.0 and 1.2; documented with photographs and measured using horizontal rod, plumb bob or level, and measuring tape, or a clinometer or similar tool), applicable to:
 - Pigeon Creek stream channel restoration
 - Perennial #3 stream channel restoration
 - Ephemeral #3 stream channel restoration
- In-Stream Flow-Changing or Grade Control Structures (stable or decreased Bank Height Ratio or any increase in Bank Height Ratio less than 0.2; documented with photographic documentation and visual observation, and measured using a clinometer or similar tool and/or a horizontal rod, plumb bob or level, and measuring tape), applicable to:
 - Pigeon Creek grade control structures
 - Perennial #3 grade control structures
 - Ephemeral #3 grade control structures

IX. MONITORING REQUIREMENTS

The Sponsor agrees to perform all necessary work to monitor the Site following the Monitoring Requirements provisions included in Section IV.I (Monitoring Requirements) of the Bank's umbrella mitigation banking instrument. In addition to those provisions, the following site-specific monitoring procedures will be utilized. Also, as described in the Bank's umbrella mitigation banking instrument, the monitoring procedures will be further described in a separate site monitoring plan that will be submitted to the Corps prior to the first monitoring event. The monitoring plan will provide the complete details of the monitoring strategy, including the location of transects, sample points, and in-stream monitoring locations.

Stream Bank Stability

The Stream Bank Stability ecological performance standard will be measured using bank pins in addition to visual inspection and photographic documentation. The bank pins will be placed on both sides of the channel at three permanent, marked locations in each restored channel as well as at a nearby permanent, marked reference location (likely in the unaltered portion of the Intermittent #1 channel) which will help to correct for the effect of frost heave on the bank pins in the restored channels.



Floodplain Connectivity

The measurement of the difference in elevation between the top of the lowest bank and the thalweg is anticipated to be accomplished using a horizontal rod, plumb bob or level, and measuring tape, but a clinometer or similar tool, along with trigonometry, may be utilized. These measurements will be made in three locations in each restored channel (Pigeon Creek, Perennial #3, and Ephemeral #3).

In-Stream Flow-Changing or Grade Control Structures

The proposed grade control structures will be judged by their bed stability in accordance with the In-Stream Flow-Changing or Grade Control Structures ecological performance standard. Bed stability will be assessed by measuring the difference in relative elevation between the top of the lowest stream bank and the thalweg at permanent marked locations, likely using a clinometer or similar tool and/or a horizontal rod, plumb bob or level, and measuring tape. This will allow for the calculation of the Bank Height Ratio of each location. All grade control structures will be quantitatively measured as well as visually assessed and photographed during each year of monitoring because the number of grade control structures on streams subject to this performance standard on the Site (three) is less than five.

X. LONG-TERM MANAGEMENT PLAN

The Sponsor agrees to perform all long-term management following the provisions included in Section IV.J (Long-Term Management Plan) of the Bank's umbrella mitigation banking instrument in addition to the following provisions.

A full schedule of maintenance tasks and cost estimates for the Site based upon 2018 prices is shown below in Table 10.

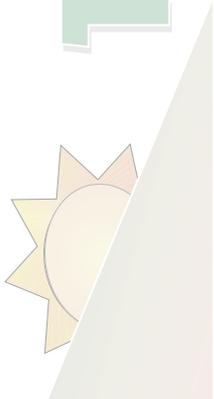


Table 10. Long-Term Management Schedule and Costs

Maintenance Item	Requirement	Acres	% of Area	\$ Cost/Unit	Schedule	Yearly Cost
Prescribed Burning	1 Visit	283	20%	\$10/Acre	Every 10 Years If Feasible	\$57
Tree & Shrub Supplemental Plantings	218 per Acre	267	1.5%	\$1.25/Bare Root Seedling	Every 2 Years If Necessary	\$546
Herbaceous Supplemental Plantings	1,742 per Acre	282	1%	\$3/Plant	Every 2 Years If Necessary	\$7,369
Water Control Berm Maintenance	1 Visit	N/A	N/A	\$500/Visit	Yearly If Necessary	\$500
Grade Control Repair	1 Visit	N/A	N/A	\$500/Visit	Yearly If Necessary	\$500
Newly Planted Timber Stand Improvement	1 Visit	267	25%	\$24/Acre	As Determined By Sponsor	\$1,602
Invasive Species Removal	2 Visits	283	1%	\$200/Acre	Twice Per Year	\$1,132
Trash Removal	1 Visit	N/A	N/A	\$300	Every 2 Years	\$150
Miscellaneous	1 Visit	N/A	N/A	\$250	Yearly	\$250
					Yearly Total	\$12,106

Long-term management will be paid from funds accumulated in the business operating account. Long-term management financial assurances will be established to guarantee that the necessary management activities occur should the Sponsor be unable to accomplish those tasks. These long-term management financial assurances are described in Section XII.B.

The Sponsor will perform long-term management of the Site in perpetuity in accordance with the terms of the long-term management plan and conservation easement which will be held by the Midwest Mitigation Oversight Association. The Site's conservation easement shall stay with the property in the instance that the title to the property is transferred to another party and any new property owner would be bound by all requirements of the conservation easement.

Due to the potential impacts to federally-listed bat species, the Sponsor, or any future long-term steward or owner of the Site property, must contact the Corps prior to any timber management or timber maintenance activities, including any trimming, felling, girdling, *etc.* The Sponsor will provide the Corps with all necessary information so that the Corps can make an effects determination. If the result of the effects determination is anything other than "no effect," then the Corps will consult with the FWS under Section 7 of the



Endangered Species Act. The Corps will notify the Sponsor of the approved activities, with appropriate conditions, at the completion of any Section 7 consultation with the FWS (if necessary) and in consultation with the remainder of the IRT members.

As mentioned in Section VIII (Ecological Performance Standards), the Site will experience a higher than average amount of exposure to invasive and undesirable species because of the frequency of flooding from the Platte River. As a result, the Sponsor will record any observations of invasive or undesirable species at monitoring sample point locations and while travelling between monitoring sample points. The species observed will be noted along with a rough approximation of the size of the infestation and one or more Global Positioning System data points will be taken to assist maintenance staff in locating invasive and undesirable species so they can be treated. The method of control will depend to some degree on which species are present and their unique characteristics and vulnerabilities. In general, the most common treatment method will likely be herbicide application with a product containing glyphosate, including one approved for use in or near aquatic environments if applicable (Rodeo or equivalent). Control of tree saplings should utilize Tordon RTU or equivalent. All label directions and safety precautions will be followed while using approved herbicides. Herbicides will be applied with a backpack or bottle sprayer for best results and to minimize overspray onto native plant materials although a boom sprayer may be used if the size of the infestation warrants it. Other potential treatments methods will include, but are not limited to, removal of the plant and roots from the ground, prescribed burning, and seedhead separation (through hand-cutting or mowing) which reduces seed production and is helpful in depleting the seed source of unwanted species, particularly annual plants.

XI. ADAPTIVE MANAGEMENT PLAN

After initial Site construction, the Sponsor shall maintain the Site using an adaptive management approach that will provide flexibility when dealing with unforeseen issues. The Sponsor agrees to perform any adaptive management following the provisions included in Section IV.K (Adaptive Management Plan) of the Bank's umbrella mitigation banking instrument.

Should site flooding cause damage that requires adaptive management, such as destruction of berms that calls the Sponsor's design into question, or an unexpected influx of invasive species, the Sponsor will submit the potential remedy or remedies to the Corps, in consultation with the IRT, for review and approval.



XII. FINANCIAL ASSURANCES

A. Short-Term Financial Assurances

The Sponsor will follow the provisions included in Section IV.L (Financial Assurances) of the Bank's umbrella mitigation banking instrument. In addition, the Sponsor agrees to provide the following short-term financial assurances for the work described in this Mitigation Plan. The Sponsor shall provide the sum of US\$28,350 as an irrevocable letter of credit from a financial institution that is a member of the Federal Deposit Insurance Corporation to the Midwest Mitigation Oversight Association, a non-profit group that will monitor compliance with the conservation easement.

The amount of short-term financial assurances shall be reduced to \$7,100 (roughly 25% of the initial short-term financial assurances) after the Corps, in consultation with the IRT, has agreed that the Site has completed all initial construction and planting activities and has had several years of successful monitoring results (at the time of Credit Release #5) according to the provisions included in Section IV.L (Financial Assurances) of the Bank's umbrella mitigation banking instrument. A draft copy of a short-term financial assurances letter of credit is included in Appendix D.

The amount of short-term financial assurances was derived by calculating the costs necessary to perform significant remedial activities across half of the Site and to monitor the Site for five years as described below and summarized in Table 11. Based on the credit release schedule identified in Section V.B (Credit Release Schedule) of the Bank's umbrella mitigation banking instrument, fifty percent (50%) of the anticipated credits for the Site are available for release to the Sponsor upon approval of the final mitigation plan, implementation of short-term financial assurances, recordation of the conservation easement, completion of construction and planting, approval of an as-built figure, and Corps' acknowledgment that the Site has successfully established wetland hydrology in the desired areas as demonstrated by the Sponsor in the first monitoring report. The Sponsor holds unencumbered fee simple title to the Site; therefore, no short-term financial assurances are required for land acquisition. All other credit releases are based upon monitoring reports that assess the fulfillment of performance standards and the Site's success. Therefore, short-term financial assurances are provided to perform significant remedial activities across half of the Site, a land area that represents the credits available for sale prior to additional credits being released to the Sponsor which will have to be justified through the achievement of performance standards.

Post-construction maintenance tasks at a mitigation site include replanting of trees and shrubs, selective spraying of invasive species, site mowing, reseeding and monitoring. On several mitigation banks and mitigation sites owned by the Sponsor, historical averages for maintenance are as follows:



Tree/Shrub Replacement:	20% of original planting
Spraying of Invasive Species:	2% of total acreage
Mowing of Site:	Reseeded areas only
Reseeding of Site:	10% of original planting
Monitoring of Site:	\$1,750 per year

These historical averages provide guidance for future budgeted maintenance activities. For the purpose of short-term financial assurance determination, these averages are multiplied by a factor of 1.25 in order to provide additional funds for unplanned expenses including inflation. The Site encompasses roughly 283 acres. Providing planned maintenance of fifty percent (50%) of all establishment, restoration, and rehabilitation areas yields roughly 142 acres of size. Assuming the planting of trees and shrubs at the highest planting density across all of this 142-acre area (as an additional factor of safety), plus the additional assumptions of native seeding at 20 pounds pure live seed (# PLS) per acre, and utilizing standard “for-hire” installation costs, the calculated required short-term financial assurances are as follows:

Table 11. Short-Term Financial Assurances Calculation

Item	Requirement	Acres	% Failure	\$ Cost/Unit	Total Cost
Trees & Shrubs	218/Acre	142	20% x 1.25	\$1.25/Bare Root Seedling	\$9,674
Reseeding	20 # PLS/Acre	142	10% x 1.25	\$50/Acre	\$888
Mowing	1 Visit	142	10% x 1.25	\$50/Acre	\$888
Herbicide Spraying	3 Visits	142	2% x 1.25	\$200/Acre	\$2,130
Water Control Berm Maintenance	1 Visit	N/A	N/A	\$500/Visit	\$500
Stream Channel Restoration Maintenance	1 Visit	N/A	N/A	\$5,000/Visit	\$5,000
Grade Control Repair	1 Visit	N/A	N/A	\$500/Visit	\$500
Monitoring	5 Years	---	---	\$1,750/Year	\$8,750
				TOTAL:	\$28,330



B. Long-Term Management Financial Assurances

The Sponsor shall provide financial assurances that will be used for long-term management of the Site after it becomes self-sustaining should the Sponsor be unable to perform those duties. The starting value of these long-term management financial assurances will be US\$12,150 which is based on the values included in Table 10.

XIII. CREDIT RELEASE SCHEDULE

The Sponsor shall receive wetland credits and/or stream credits based upon the achievement of the Site's ecological performance standards and according to the credit release schedule contained in Section V.B (Credit Release Schedule) of the Bank's umbrella mitigation banking instrument.

XIV. REFERENCES

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U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, USDA-Natural Resources Conservation Service, Missouri Department of



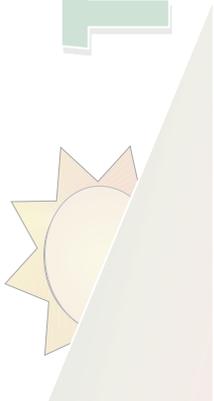
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XV. EXECUTION AND AGENCY CONCURRENCE

The Kansas City District, Corps of Engineers, along with the members of the Interagency Review Team, have participated with the bank sponsor (Swallow Tail, LLC) in the development of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek and this mitigation plan.

I have determined that the final mitigation plan is complete and that the establishment of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek, as part of the Nishnabotna / Platte EDU Wetland and Stream Umbrella Mitigation Bank, will provide appropriate compensation for impacts to wetlands and streams associated with unavoidable impacts to these resources that result from activities authorized by the Kansas City District's issuance of Department of the Army Permits.

Date: _____

Mark D. Frazier
Chief, Regulatory Branch
Operations Division



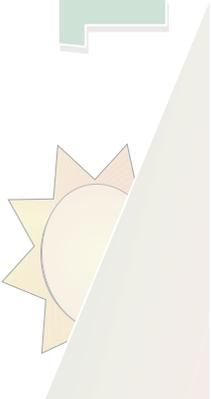
IRT CONCURRENCE:

The U.S. Environmental Protection Agency, Region 7, along with the members of the Interagency Review Team, has participated with the bank sponsor (Swallow Tail, LLC) in the development of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek and this mitigation plan.

I concur that the final mitigation plan is complete and that the establishment of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek, as part of the Nishnabotna / Platte EDU Wetland and Stream Umbrella Mitigation Bank, will provide appropriate compensation for impacts to wetlands and streams associated with unavoidable impacts to these resources that result from activities authorized by the Kansas City District's issuance of Department of the Army Permits.

Jeffery Robichaud
Director
Water, Wetlands, and Pesticides Division

Date: _____

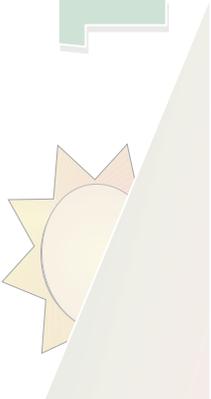


IRT CONCURRENCE:

The U.S. Fish and Wildlife Service, along with the members of the Interagency Review Team, has participated with the bank sponsor (Swallow Tail, LLC) in the development of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek and this mitigation plan.

I concur that the final mitigation plan is complete and that the establishment of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek, as part of the Nishnabotna / Platte EDU Wetland and Stream Umbrella Mitigation Bank, will provide appropriate compensation for impacts to wetlands and streams associated with unavoidable impacts to these resources that result from activities authorized by the Kansas City District's issuance of Department of the Army Permits.

_____ Date: _____
Karen Herrington
Supervisor, Missouri Ecological Services Field Office



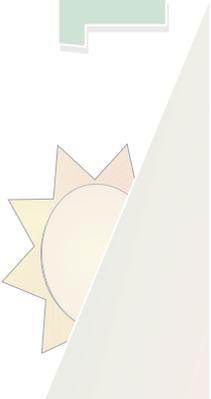
IRT CONCURRENCE:

The Missouri Department of Natural Resources, along with the members of the Interagency Review Team, has participated with the bank sponsor (Swallow Tail, LLC) in the development of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek and this mitigation plan.

I concur that the final mitigation plan is complete and that the establishment of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek, as part of the Nishnabotna / Platte EDU Wetland and Stream Umbrella Mitigation Bank, will provide appropriate compensation for impacts to wetlands and streams associated with unavoidable impacts to these resources that result from activities authorized by the Kansas City District's issuance of Department of the Army Permits.

Leanne Tippett-Mosby
Director, Division of Environmental Quality

Date: _____



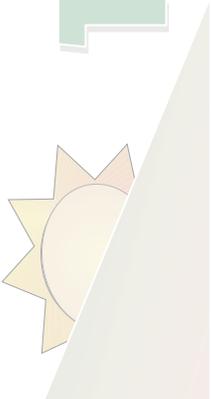
IRT CONCURRENCE:

The Missouri Department of Conservation, along with the members of the Interagency Review Team, has participated with the bank sponsor (Swallow Tail, LLC) in the development of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek and this mitigation plan.

I concur that the final mitigation plan is complete and that the establishment of the Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek, as part of the Nishnabotna / Platte EDU Wetland and Stream Umbrella Mitigation Bank, will provide appropriate compensation for impacts to wetlands and streams associated with unavoidable impacts to these resources that result from activities authorized by the Kansas City District's issuance of Department of the Army Permits.

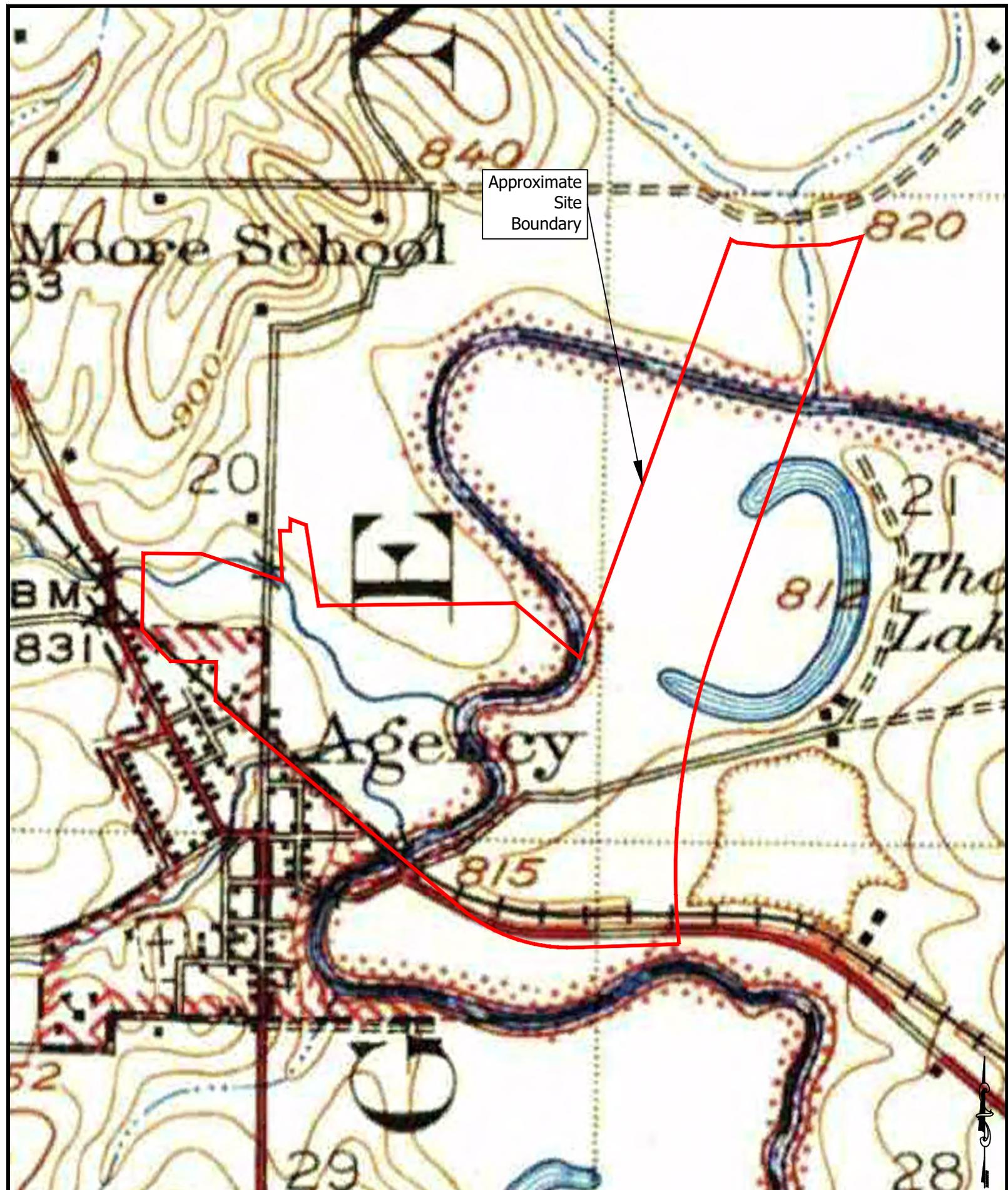
David H. Thorne, Ph.D.
Policy Supervisor, Policy Coordination Unit

Date: _____



APPENDIX A

HISTORICAL TOPOGRAPHIC MAPS AND AERIAL PHOTOGRAPHS



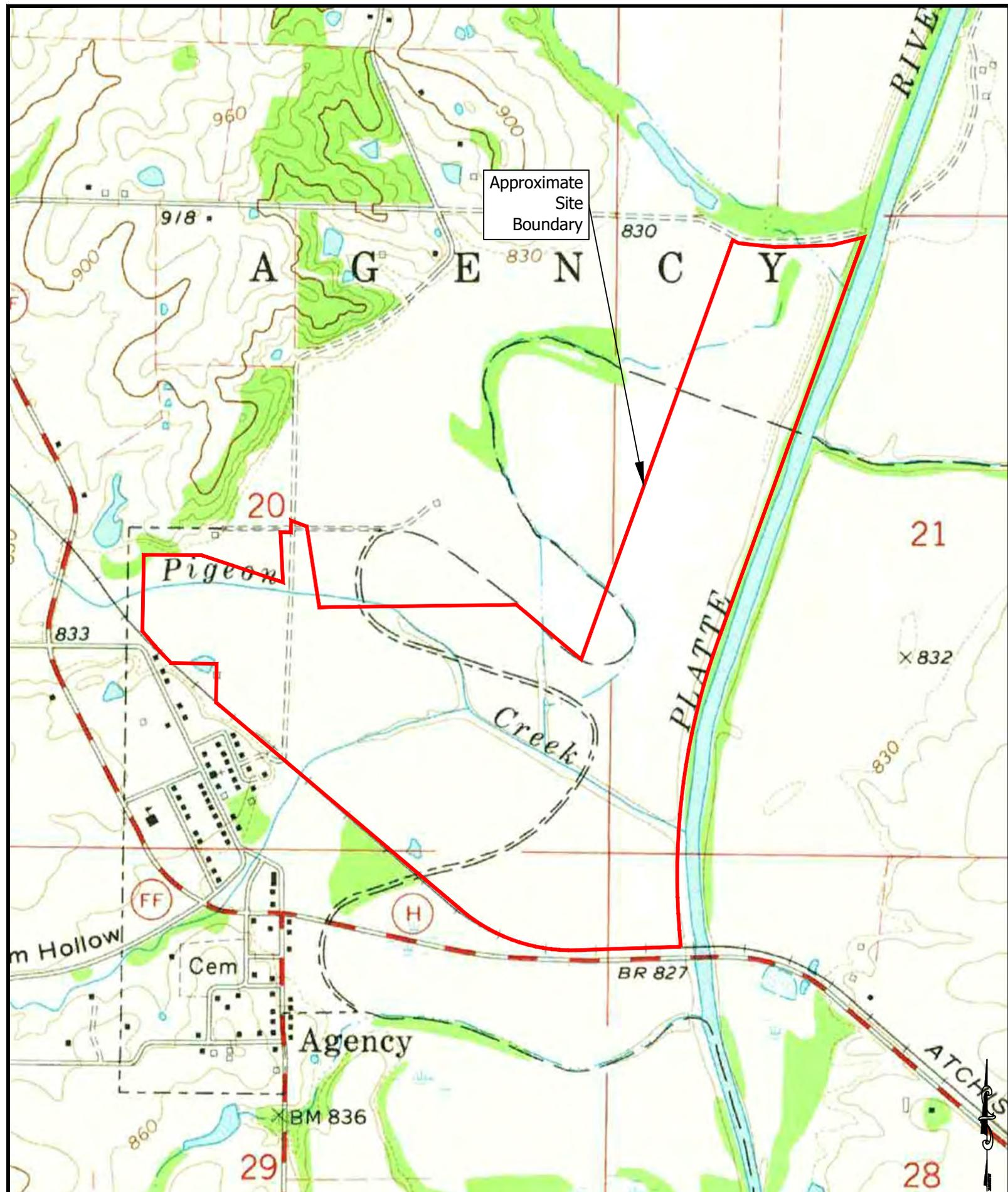
Revisions		
No.	Description	Date



Terra Technologies
6240 West 135th Street, Suite 100 Overland Park, KS 66223

Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

1927 USGS
Topographic Map
DR- ING D-TE
FIG 1 JUN 2018



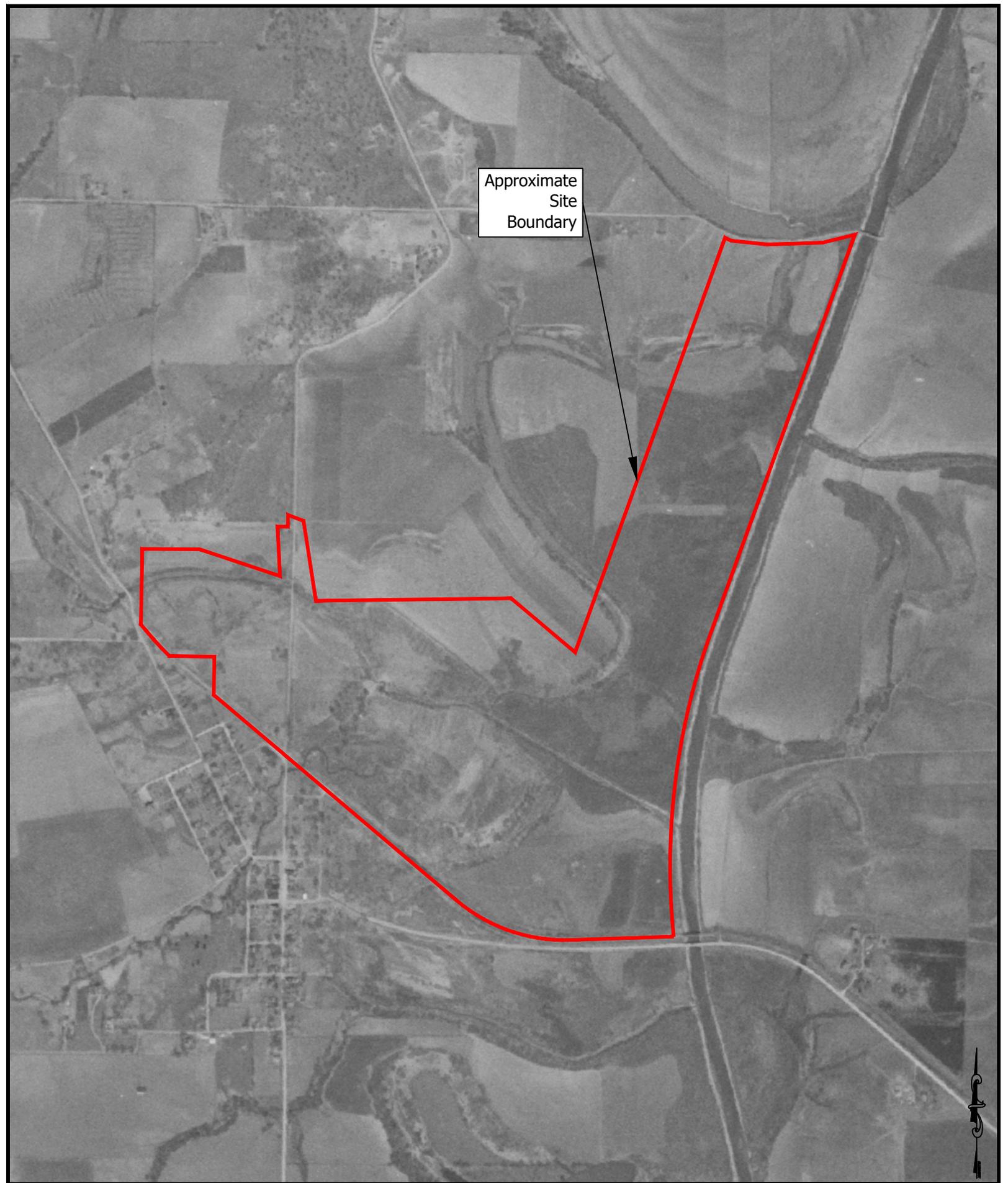
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No.	Description	Date



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6240 West 135th Street, Suite 100 Overland Park, KS 66223

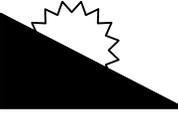
Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

1971 USGS
Topographic Map
DR- ING D-TE
FIG 2 JUN 2018



Approximate
Site
Boundary

Revisions		
No.	Description	Date



**Terra
Technologies**
6240 West 135th Street, Suite 100 Overland Park, KS 66223

Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

1950 Aerial
Photograph
DR- ING D-TE
FIG 3 JUN 2018



6-13-19

6-1-19

Approximate Site Boundary



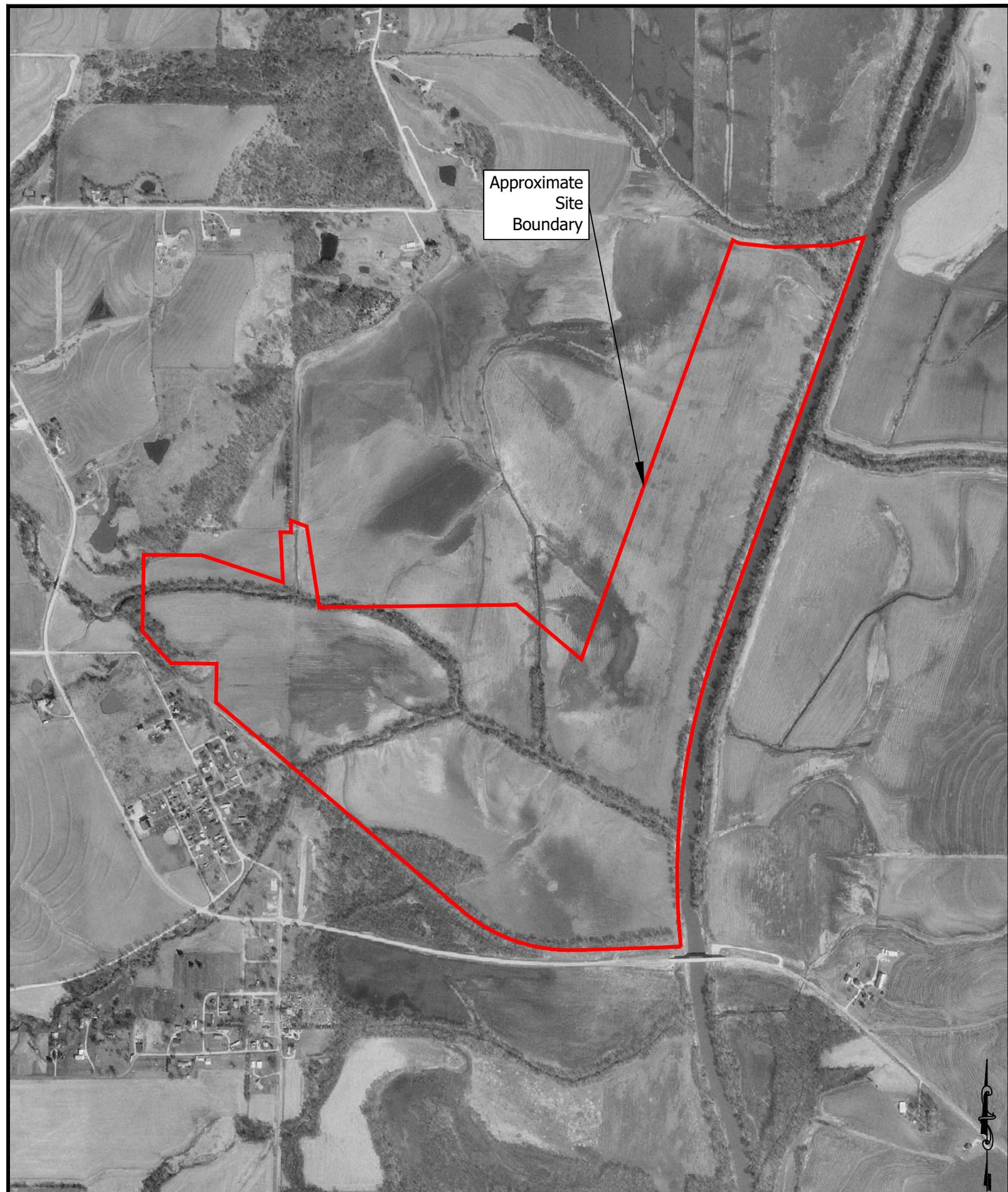
Revisions		
No.	Description	Date



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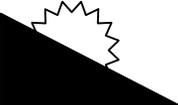
Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

1969 Aerial Photograph
DR- ING D-TE
FIG 4 JUN 2018



Approximate
Site
Boundary

Revisions		
No.	Description	Date



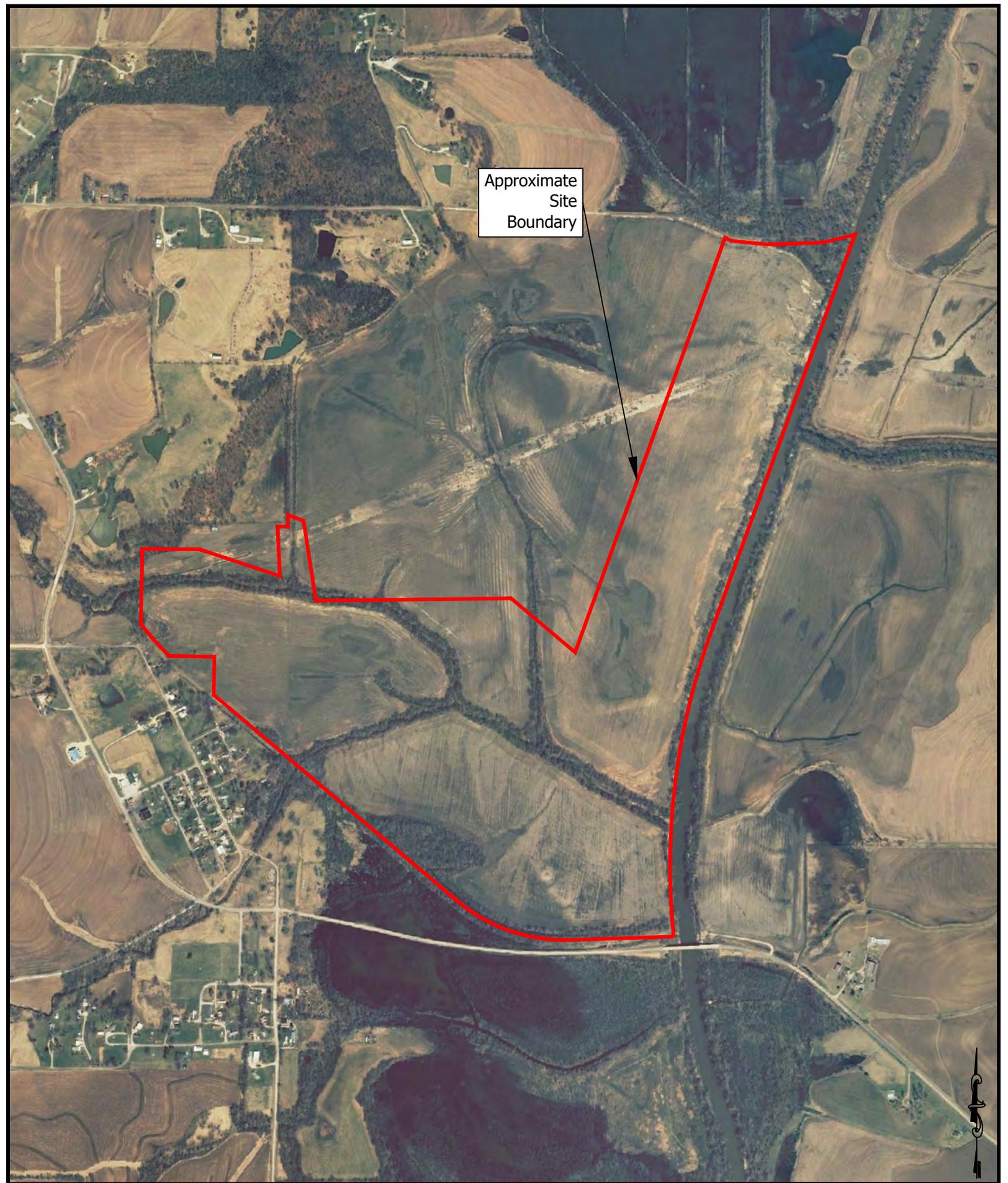
**Terra
Technologies**

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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

March 1997
Aerial Photograph

DR- ING D-TE
FIG 5 JUN 2018



Approximate
Site
Boundary

Revisions		
No.	Description	Date

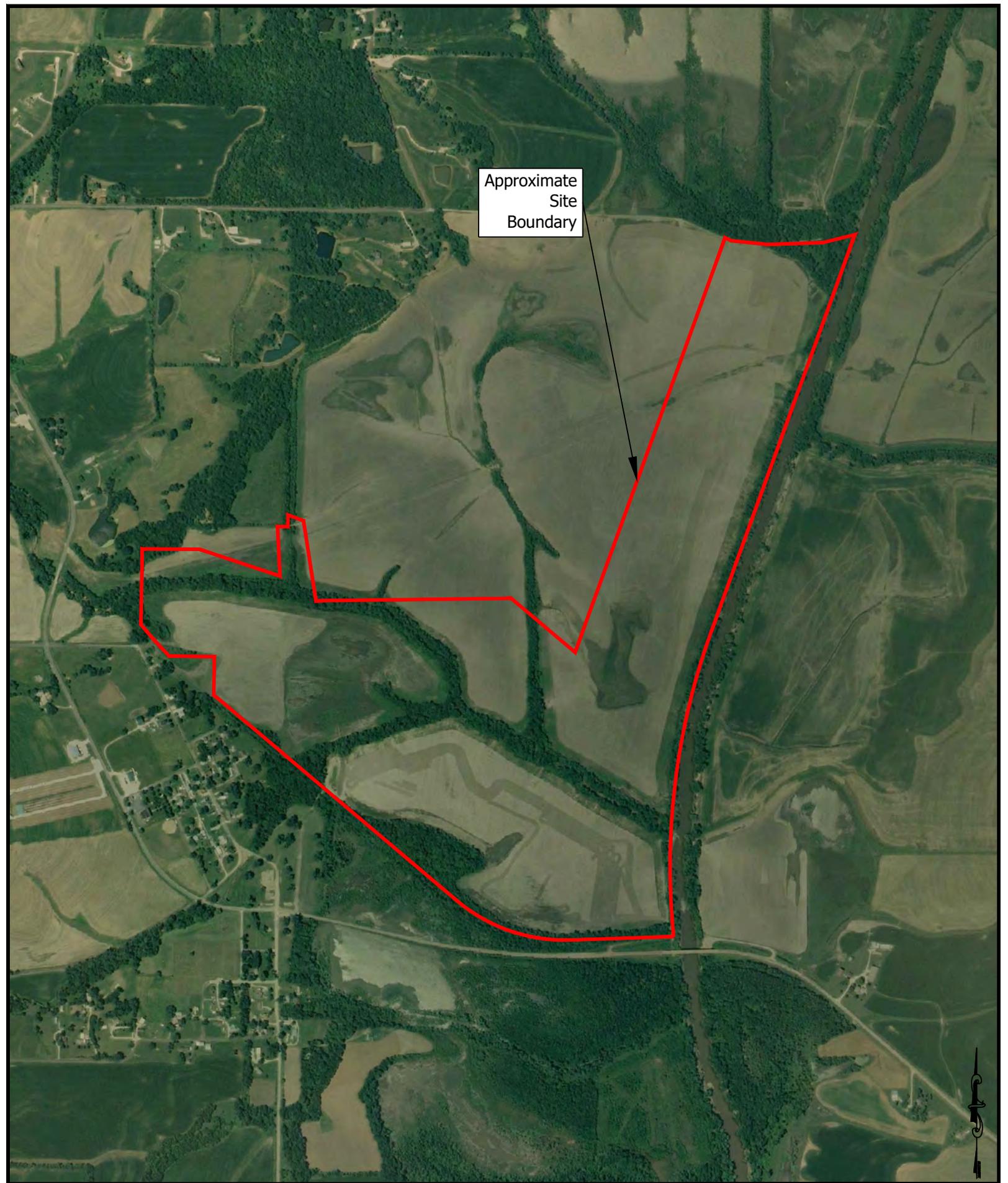


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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

March 2008
Aerial Photograph
DR- ING D-TE
FIG 6 JUN 2018





Approximate
Site
Boundary

Revisions		
No.	Description	Date

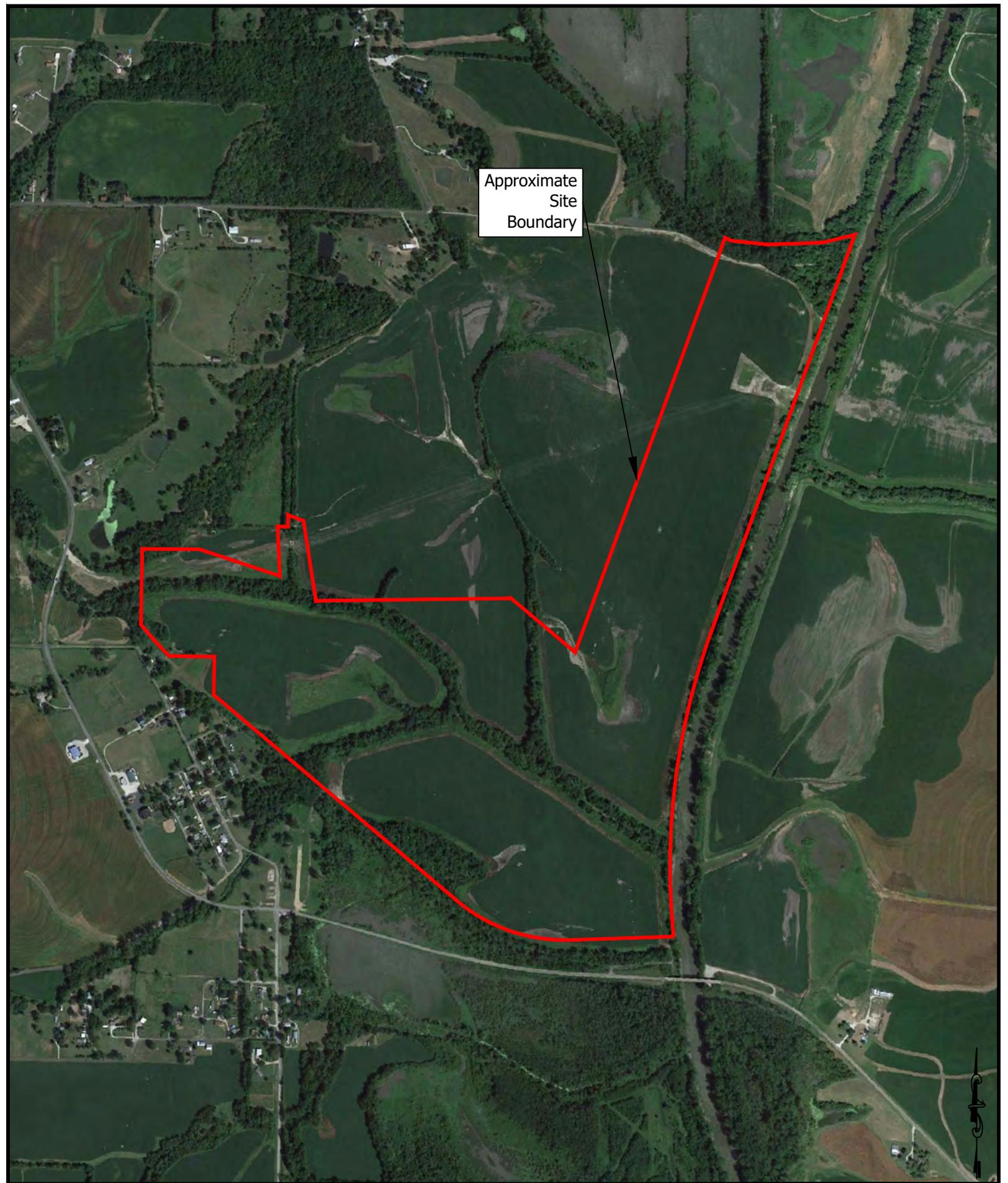


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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

June 2009
Aerial Photograph
DR- ING D-TE
FIG 7 JUN 2018





Approximate
Site
Boundary

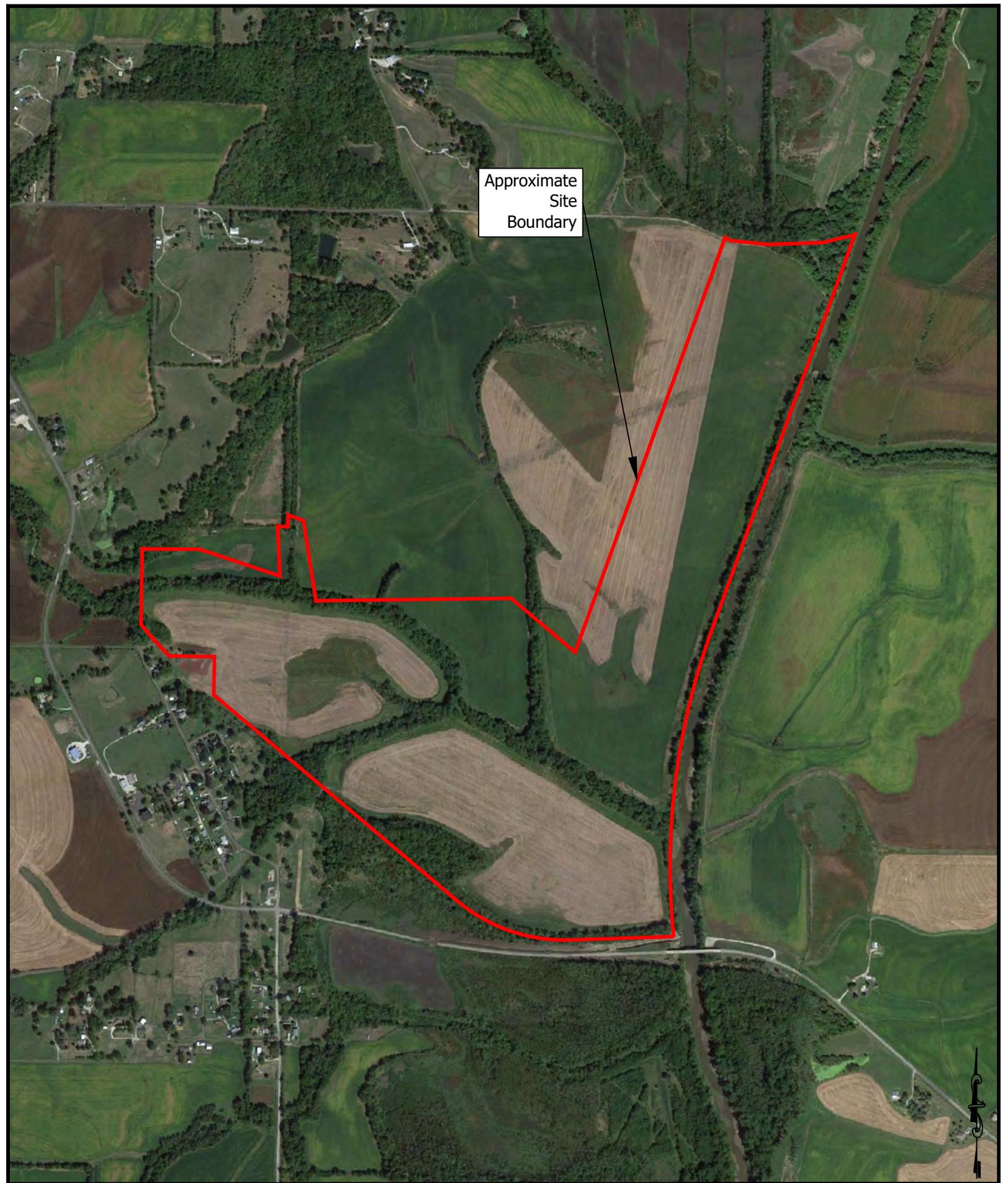
Revisions		
No.	Description	Date



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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

August 2010
Aerial Photograph
DR- ING D-TE
FIG 8 JUN 2018



Approximate
Site
Boundary

Revisions		
No.	Description	Date

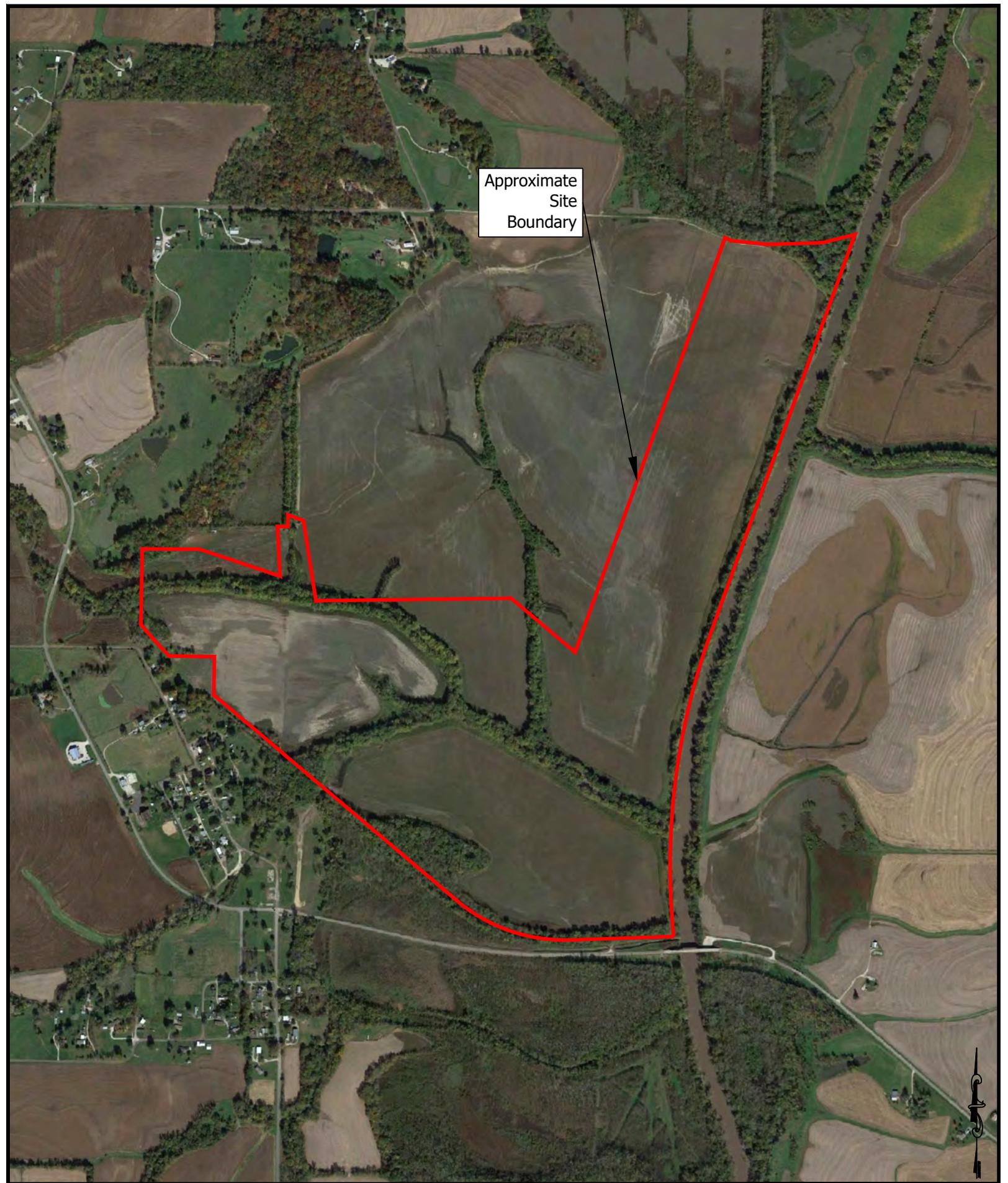


**Terra
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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

September 2012
Aerial Photograph
DR- ING D-TE
FIG 9 JUN 2018





Approximate
Site
Boundary

Revisions		
No.	Description	Date



**Terra
Technologies**
6240 West 135th Street, Suite 100 Overland Park, KS 66223

Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

October 2014
Aerial Photograph
DR- ING D-TE
FIG 10 JUN 2018



APPENDIX B

PHOTOGRAPHIC DOCUMENTATION

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo showing the Platte River (Perennial #1) near the upstream end of the Site at its confluence with Intermittent #2. View faces upstream.	
PHOTO #: 1	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo facing downstream from the same location as the previous image showing the Platte River near the upstream end of the Site at its confluence with Intermittent #2.	
PHOTO #: 2	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo facing upstream showing Intermittent #2 at the confluence with the Platte River.	
PHOTO #: 3	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo looking downstream on Intermittent #2 near the location where it flows onto the Site. View faces downstream.	
PHOTO #: 4	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo facing upstream of the Platte River near the downstream end of the Site at its confluence with Pigeon Creek.	
PHOTO #: 5	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo from the same location as the previous image, facing downstream on the Platte River near the downstream end of the Site at its confluence with Pigeon Creek (the mouth of which is shown in the right side of the photograph).	
PHOTO #: 6	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: CG	
COMMENTS: Photo facing upstream of Pigeon Creek (Perennial #2) as it flows into the Site.	
PHOTO #: 7	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: CG	
COMMENTS: Photo from the same location as the previous image, facing downstream on Pigeon Creek as it flows into the Site.	
PHOTO #: 8	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: AK	
COMMENTS: Photo looking upstream on Ephemeral #3 immediately upstream of the location where it flows into Pigeon Creek. View faces north.	
PHOTO #: 9	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: AK	
COMMENTS: Photo facing downstream showing Pigeon Creek at the confluence with Ephemeral #3. View faces east.	
PHOTO #: 10	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: AK	
COMMENTS: Photo facing upstream of Pigeon Creek and the skeleton of a former bridge at the confluence with Ephemeral #3. View faces west.	
PHOTO #: 11	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo looking upstream on Pigeon Creek at its confluence with Intermittent #1.	
PHOTO #: 12	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo facing upstream showing Intermittent #1 as it flows into Pigeon Creek.	
PHOTO #: 13	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo showing the upland riparian buffer along Intermittent #1. View faces north.	
PHOTO #: 14	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo from the same location as the previous image, looking downstream at Pigeon Creek.	
PHOTO #: 15	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo facing upstream showing Pigeon Creek at the confluence with the Platte River.	
PHOTO #: 16	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing the riparian buffer along Pigeon Creek, which was determined not to be a wetland. View faces north.	
PHOTO #: 17	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo from the same location as the previous image showing the upland riparian buffer along Pigeon Creek. View faces south.	
PHOTO #: 18	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo looking upstream of Perennial #3 as it flows onto the site.	
PHOTO #: 19	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo looking downstream from the most upstream limit of Perennial #3 as it flows onto the Site.	
PHOTO #: 20	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo of location on Perennial #3 where minnows and tadpoles were observed. This position is roughly half way along this stream's path within the Site. View faces upstream.	
PHOTO #: 21	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo of Perennial #3 from the same location as the previous image (where minnows and tadpoles were observed). View faces downstream.	
PHOTO #: 22	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing Ephemeral #6, a tributary of Perennial #3 along with the associated riparian community. View faces upstream.	
PHOTO #: 23	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing where farmed Wetland #22 drains into Ephemeral #6. View faces upstream (northwest).	
PHOTO #: 24	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing Ephemeral #6 at confluence with Perennial #3. View faces upstream on Ephemeral #6.	
PHOTO #: 25	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing Perennial #3 at the confluence with Ephemeral #6. View faces upstream on Perennial #3.	
PHOTO #: 26	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing Perennial #3 at the confluence with Ephemeral #6. View faces downstream on Perennial #3.	
PHOTO #: 27	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: AK	
COMMENTS: Photo showing upland row crop field near the northwest portion of the Site. Note that this portion of the field is at a higher elevation. View faces east.	
PHOTO #: 28	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: AK	
COMMENTS: Photo showing farmed Wetland #6, located in the northwestern portion of the Site. View faces east.	
PHOTO #: 29	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo showing part of the 159.35-acre farmed Wetland #2 from the east side of the Site. View faces north.	
PHOTO #: 30	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo from the same location as the previous image showing farmed Wetland #2 from the eastern side of the Site. View faces east.	
PHOTO #: 31	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo showing scrub shrub Wetland #10, located near the center of the Site. View faces north.	
PHOTO #: 32	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo showing farmed Wetland #14 which is positioned near the northeastern corner of the Site. View faces south.	
PHOTO #: 33	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: SH	
COMMENTS: Photo showing the southern limit of farmed Wetland #2 in the eastern portion of the Site. View faces south.	
PHOTO #: 34	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing the upland agricultural row crop field in the southeastern portion of the Site, which was determined not to be a wetland. View faces east.	
PHOTO #: 35	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing the upland agricultural row crop field and shrub area in the southern portion of the Site, which was determined not to be a wetland. View faces north.	
PHOTO #: 36	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing the upland agricultural row crop field in the southern portion of the Site which was determined not to be a wetland. View faces west.	
PHOTO #: 37	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing forested Wetland #17 to the south of the Site. View faces east.	
PHOTO #: 38	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing farmed Wetland #20 which is located near the southern limit of the Site. View faces east.	
PHOTO #: 39	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing a view of forested Wetland #20 which is positioned along the southern Site boundary. View faces east.	
PHOTO #: 40	

PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing scrub shrub Wetland #18 along the southern Site boundary near Perennial #3. View faces north.	
PHOTO #: 41	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing farmed Wetland #19, located southeast of the previous image. View faces northeast.	
PHOTO #: 42	

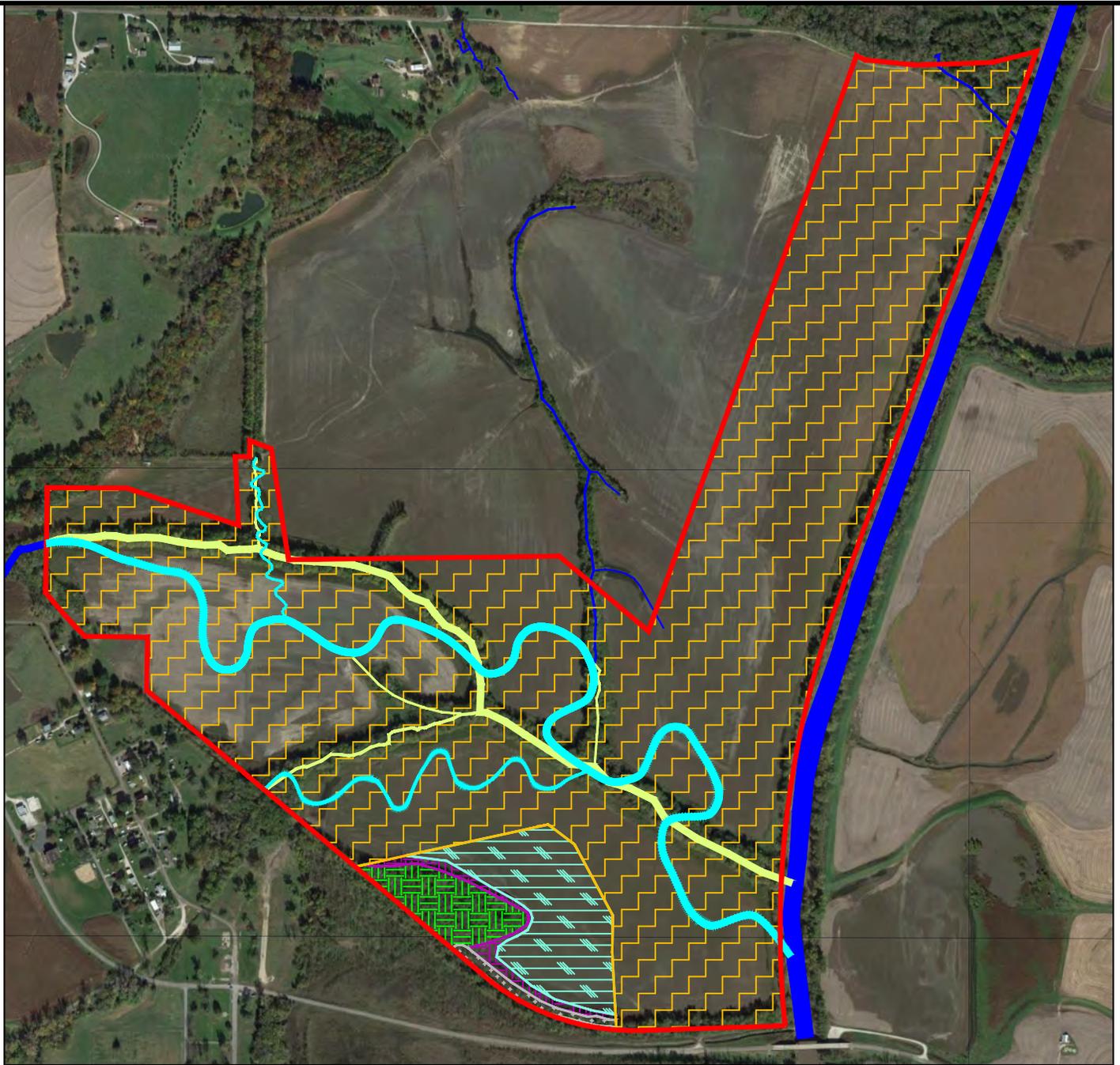
PHOTO LOG

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing scrub shrub Wetland #21, located north of Perennial #3. View faces north.	
PHOTO #: 43	

DATE: 3/20/17	SITE NAME: Nishnabotna / Platte EDU Umbrella Mitigation Bank Site 2 - Pigeon Creek
TAKEN BY: DD	
COMMENTS: Photo showing farmed Wetland #22 in the foreground and scrub shrub Wetland #21 in the background. This wetland is located south of Pigeon Creek and west of Perennial #3. View faces west.	
PHOTO #: 44	

APPENDIX C

MITIGATION PLAN FIGURES

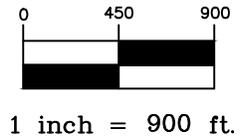


LEGEND

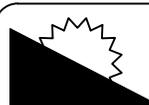
-  **Riparian Buffer Restoration**
257.97 Acres
-  **Emergent Wetland Restoration**
14.45 Acres
-  **Forested Wetland Enhancement**
6.33 Acres
-  **Scrub-Shrub Wetland Enhancement**
2.39 Acres

-  **Wetland Buffers**
1.33 Acres

-  **Site Boundary**
-  **Existing Stream Channel Not To Be Disturbed**
-  **Stream Channel Restoration**
-  **Existing Stream Channel To Be Filled**



Revisions		
No.	Description	Date

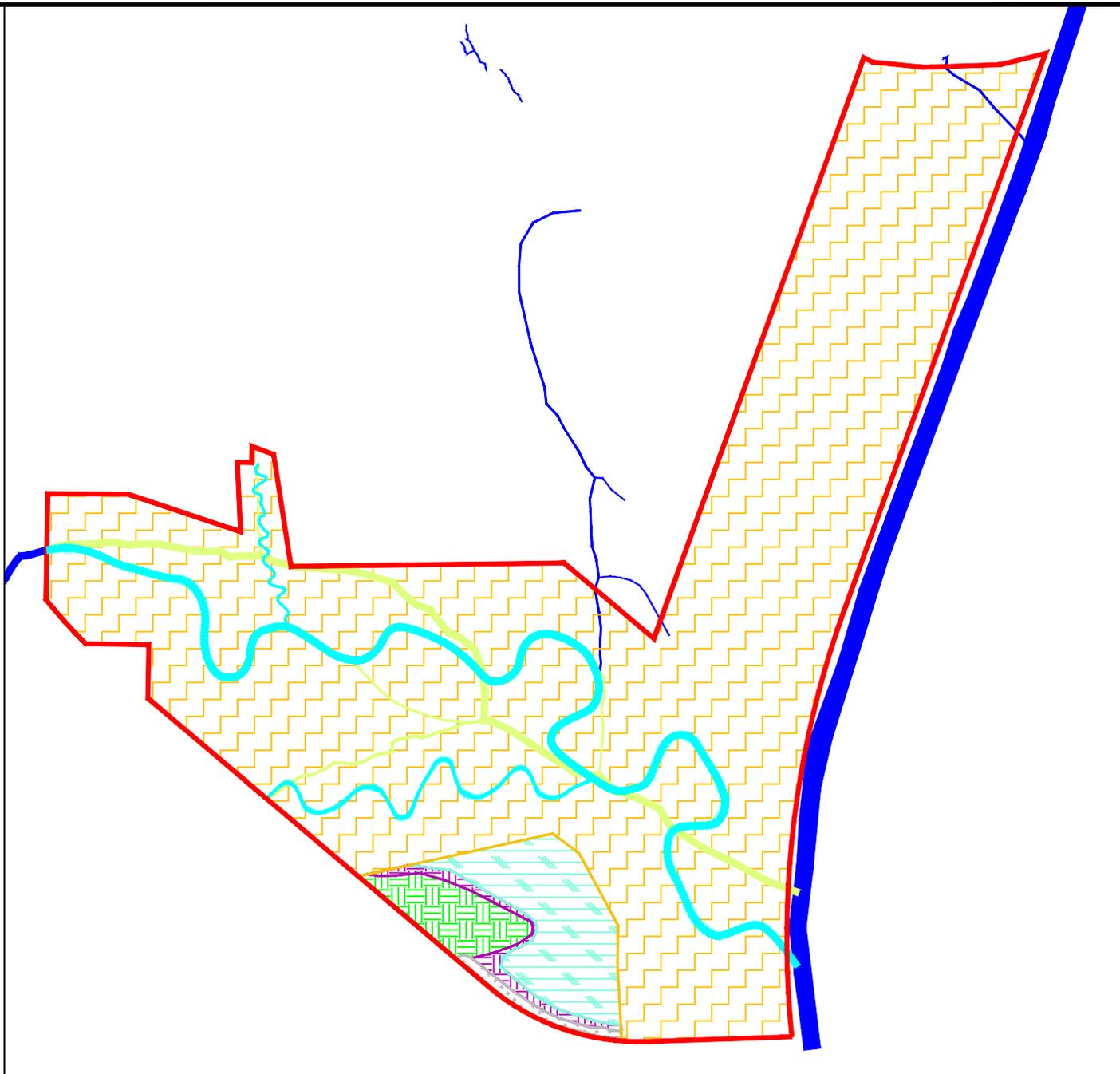


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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Mitigation Plan:
Crediting Figure

DRAWING	DATE
FIG 1	JUN 2018

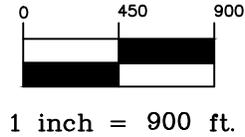


LEGEND

-  **Riparian Buffer Restoration**
257.97 Acres
-  **Emergent Wetland Restoration**
14.45 Acres
-  **Forested Wetland Enhancement**
6.33 Acres
-  **Scrub-Shrub Wetland Enhancement**
2.39 Acres

-  **Wetland Buffers**
1.33 Acres

-  **Site Boundary**
-  **Existing Stream Channel Not To Be Disturbed**
-  **Stream Channel Restoration**
-  **Existing Stream Channel To Be Filled**



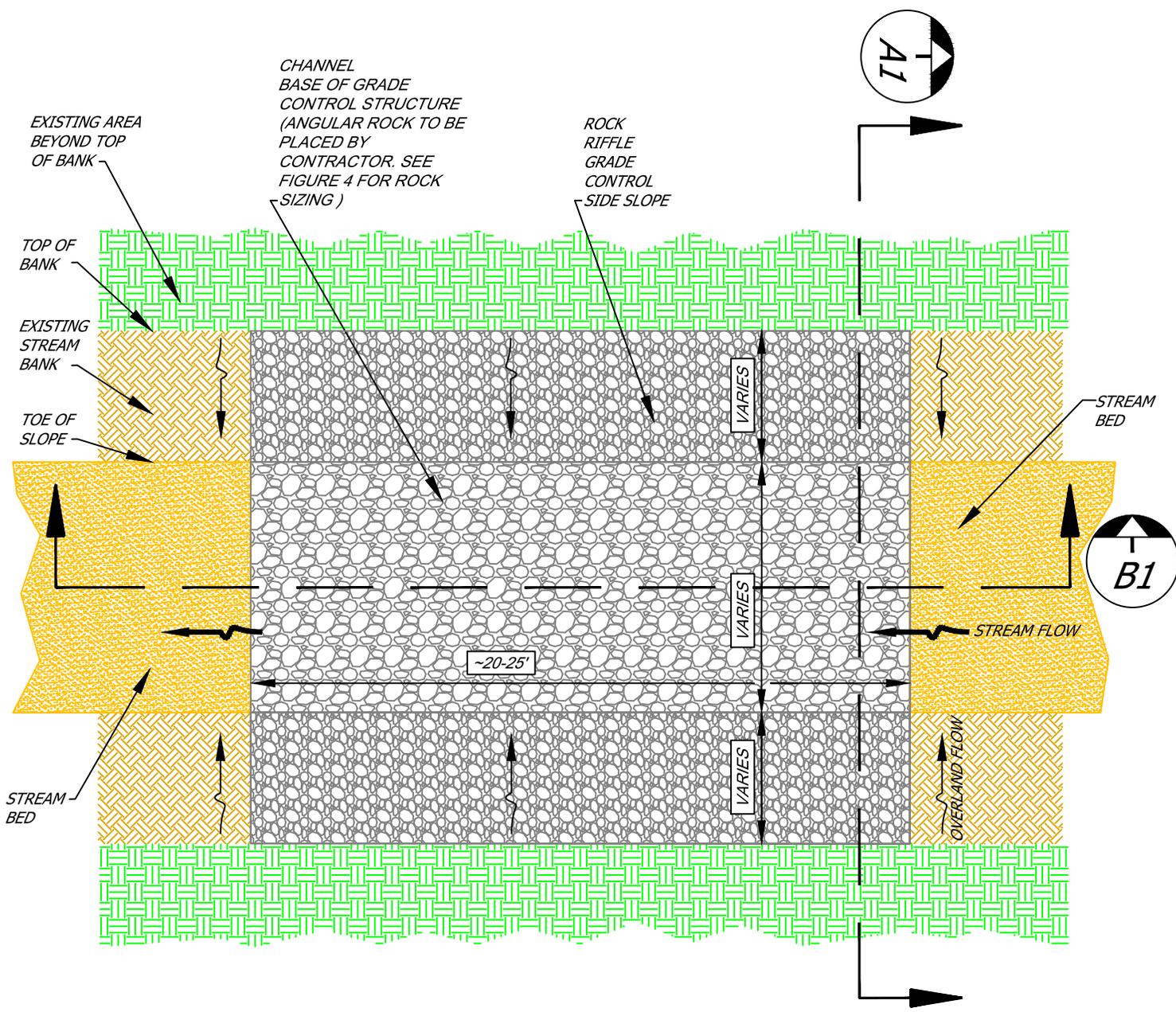
Revisions		
No.	Description	Date



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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Mitigation Plan:
Crediting Figure
(Without Aerial
Photograph)
DRAWING DATE
FIG 2 | JUN 2018



*PERENNIAL & INTERMITTENT STREAM
AT GRADE (NO CREST)
RESTORED CHANNEL
MODIFIED NEWBURY ROCK RIFFLE /
GRADE CONTROL STRUCTURE
PLAN VIEW*

NOT TO SCALE

Revisions		
No.	Description	Date

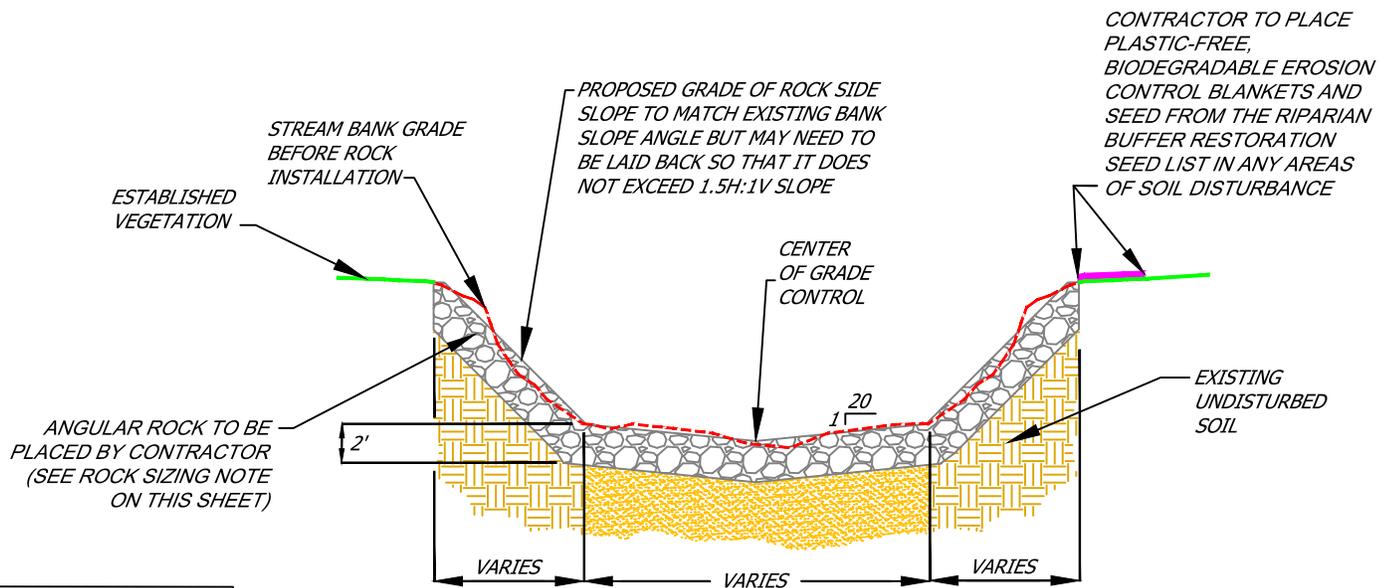


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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Typical Details:
Perennial and Intermittent
Stream Grade Controls
(Plan View)

DRAWING	DATE
FIG 3	JUN 2018



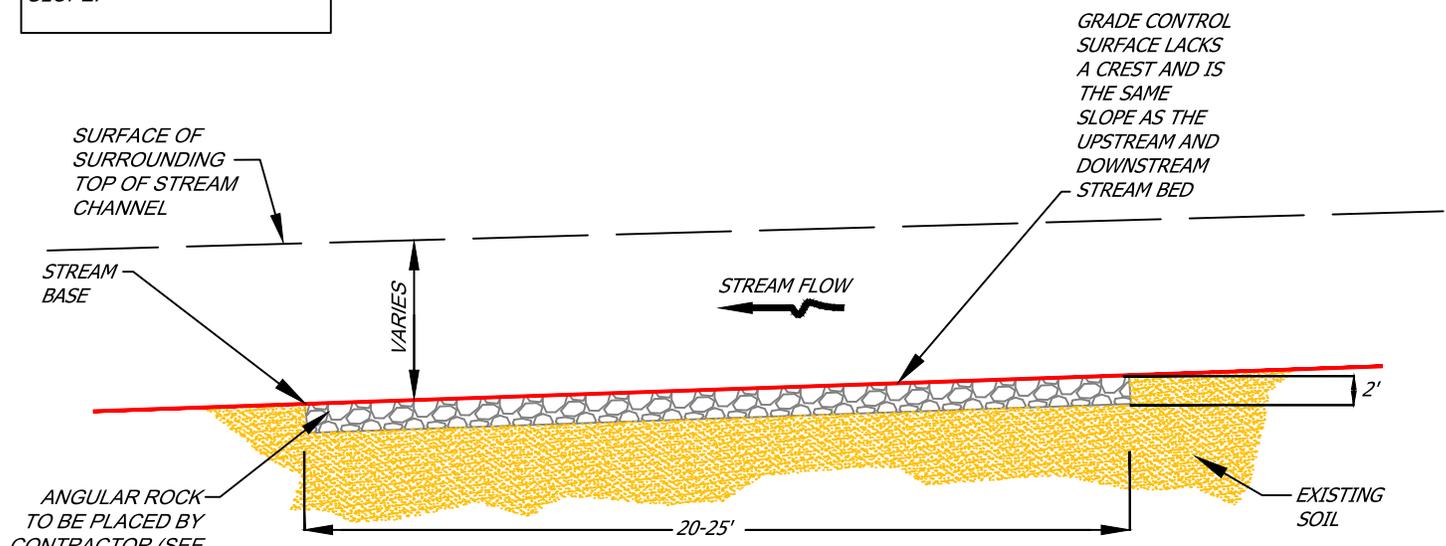
CONSTRUCTION NOTES:

ROCK SIZING:
 75% 12-18 INCH ROCK
 25% 2-INCH CLEAN

EXCAVATE 2'-DEEP HOLE, PLACE 12-18 INCH ROCK, THEN DUMP 2-INCH CLEAN TO FILL GAPS. ADD SOME SOIL BACK TO FILL GAPS AND COMPACT. FINISHED TOP ELEVATION SHOULD MATCH THE UPSTREAM AND DOWNSTREAM UNDISTURBED SLOPE.

(A1) PERENNIAL & INTERMITTENT STREAM AT GRADE (NO CREST) RESTORED CHANNEL MODIFIED NEWBURY ROCK RIFFLE / GRADE CONTROL STRUCTURE CROSS SECTION

NOT TO SCALE



(B1) PERENNIAL & INTERMITTENT STREAM AT GRADE (NO CREST) RESTORED CHANNEL MODIFIED NEWBURY ROCK RIFFLE / GRADE CONTROL STRUCTURE PROFILE

NOT TO SCALE

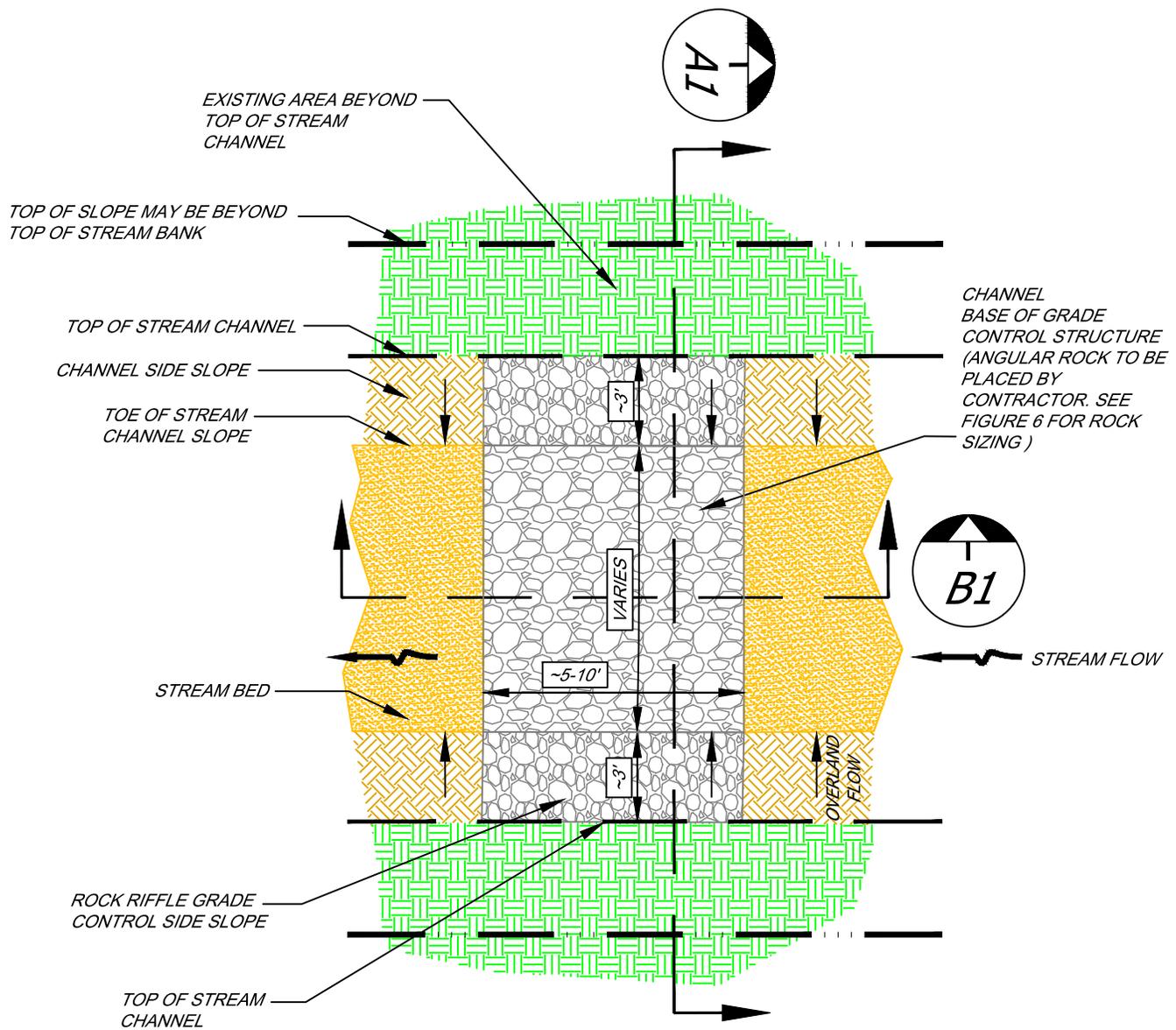
Revisions		
No.	Description	Date

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Nishnabotna / Platte EDU
 Umbrella Mitigation Bank
 Site 2 - Pigeon Creek

Typical Details:
 Perennial and Intermittent Stream Grade Controls (Cross Section and Profile)

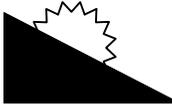
DRAWING DATE
 FIG 4 JUN 2018



**EPHEMERAL #3
 AT GRADE (NO CREST)
 ENGINEERED ROCK RIFFLE
 GRADE CONTROL STRUCTURE
 PLAN VIEW**

NOT TO SCALE

Revisions		
No.	Description	Date

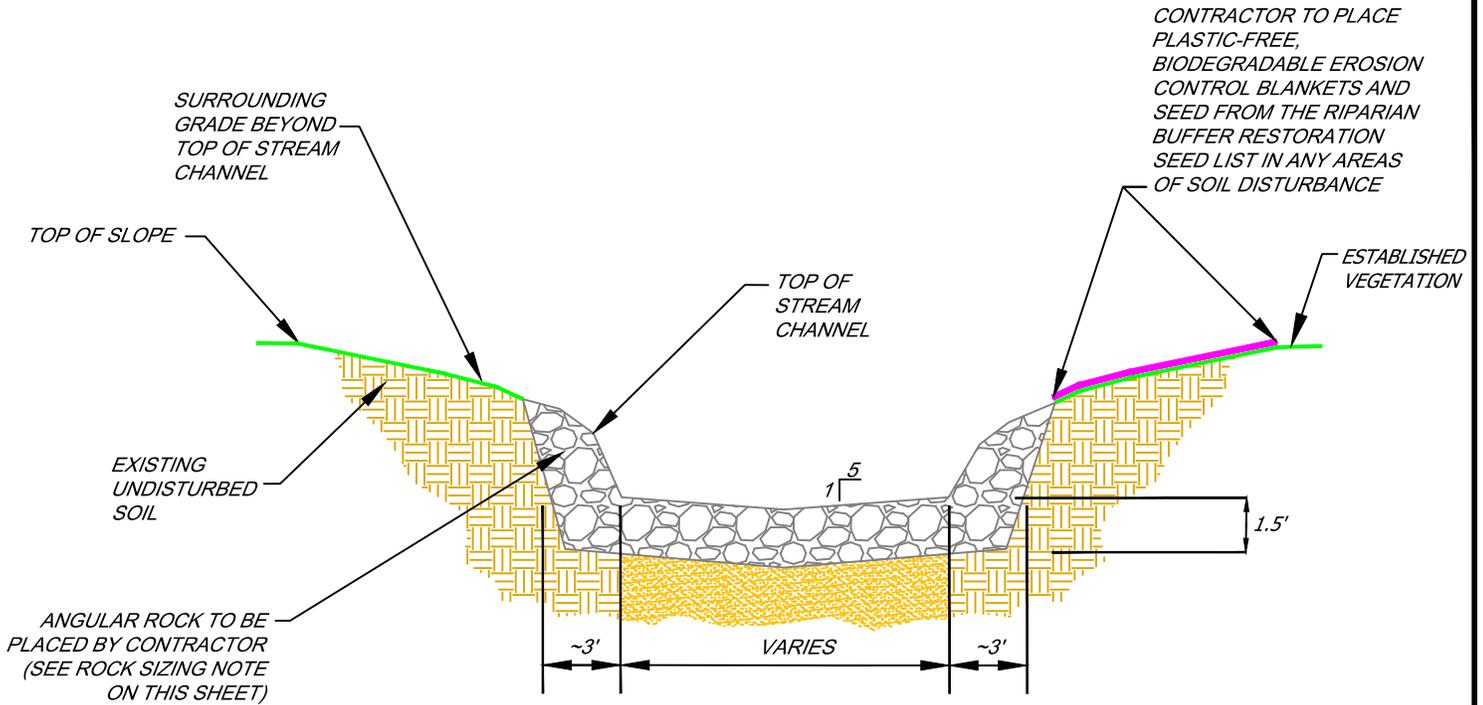


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Nishnabotna / Platte EDU
 Umbrella Mitigation Bank
 Site 2 - Pigeon Creek

Typical Details:
 Ephemeral Stream
 Grade Controls
 (Plan View)

DRAWING	DATE
FIG 5	JUN 2018



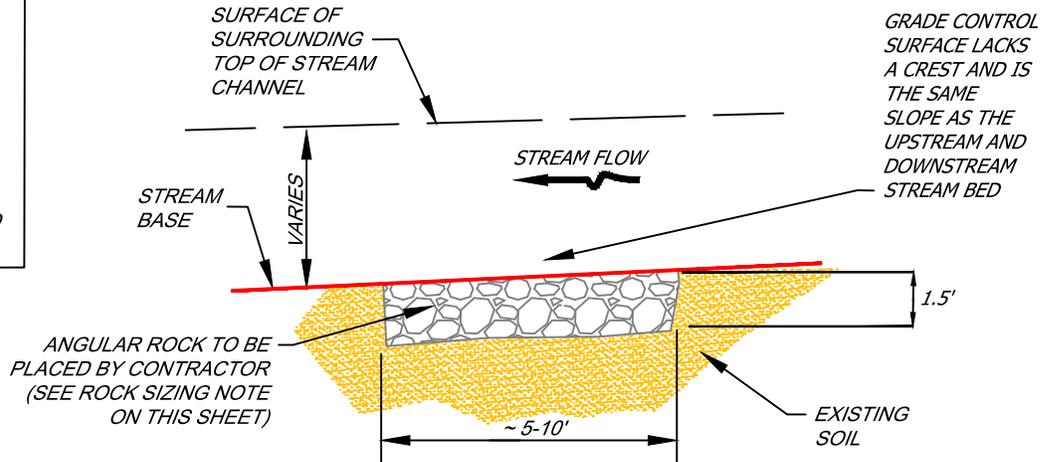
A1 EPHEMERAL #3
AT GRADE (NO CREST)
ENGINEERED ROCK RIFFLE
GRADE CONTROL STRUCTURE
CROSS SECTION

CONSTRUCTION NOTES:

ROCK SIZING:
75% 6-12 INCH ROCK
25% 2-INCH CLEAN

EXCAVATE 2'-DEEP HOLE,
PLACE 6-12 INCH ROCK,
THEN DUMP 2-INCH CLEAN
TO FILL GAPS. ADD SOME
SOIL BACK TO FILL GAPS
AND COMPACT. FINISHED
TOP ELEVATION SHOULD
MATCH THE UPSTREAM AND
DOWNSTREAM UNDISTURBED
SLOPE.

NOT TO SCALE



B1 EPHEMERAL #3
AT GRADE (NO CREST)
ENGINEERED ROCK RIFFLE
GRADE CONTROL STRUCTURE
PROFILE

NOT TO SCALE

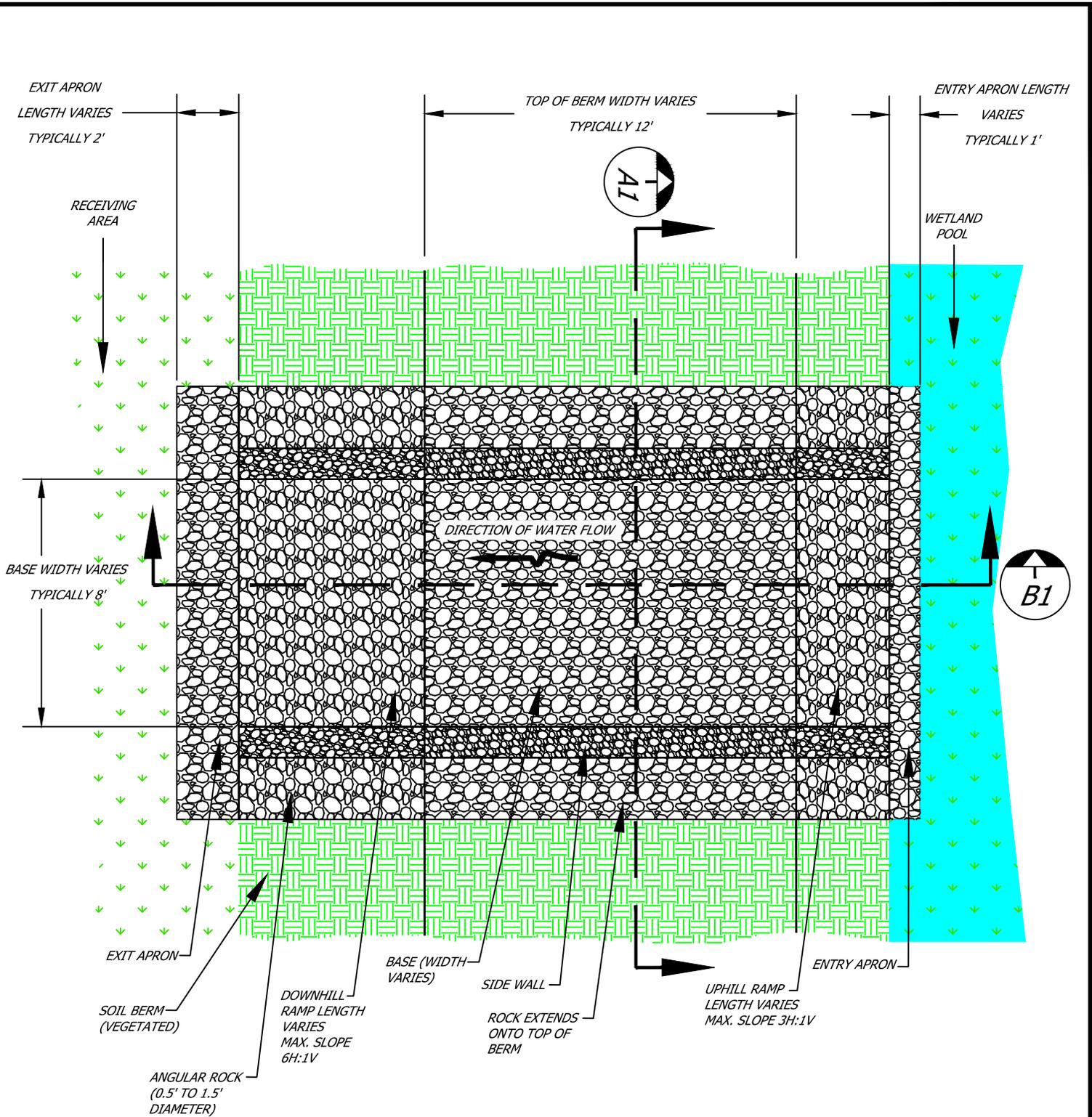
Revisions		
No.	Description	Date

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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Typical Details:
Ephemeral Stream
Grade Controls
(Cross Section and Profile)

DRAWING DATE
FIG 6 JUN 2018



WETLAND POOL ROCK OUTLET STRUCTURE PLAN VIEW

NOT TO SCALE

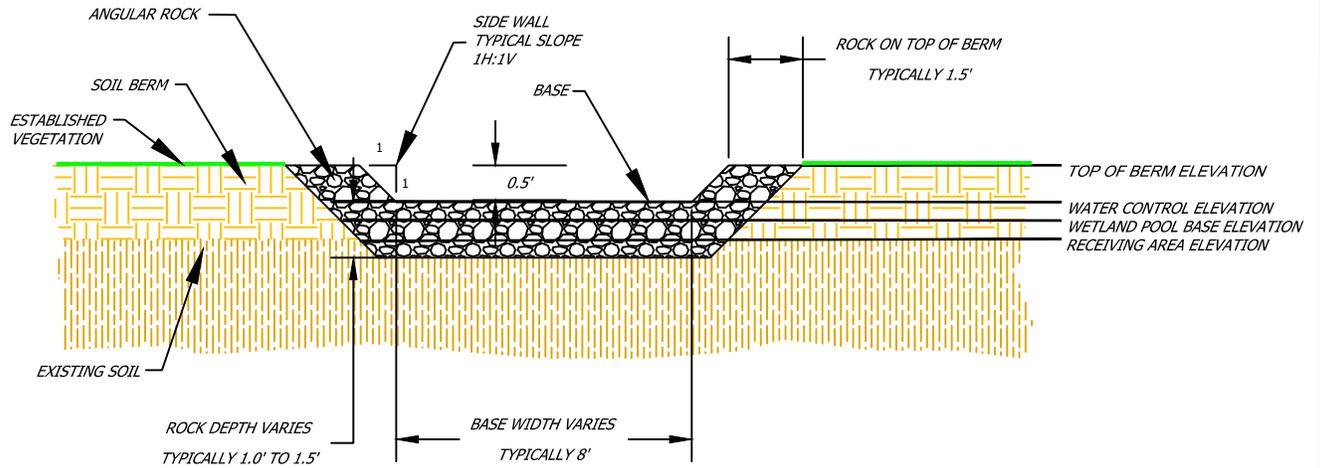
Revisions		
No.	Description	Date

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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Typical Details:
Wetland Pool Rock Outlet
(Plan View)

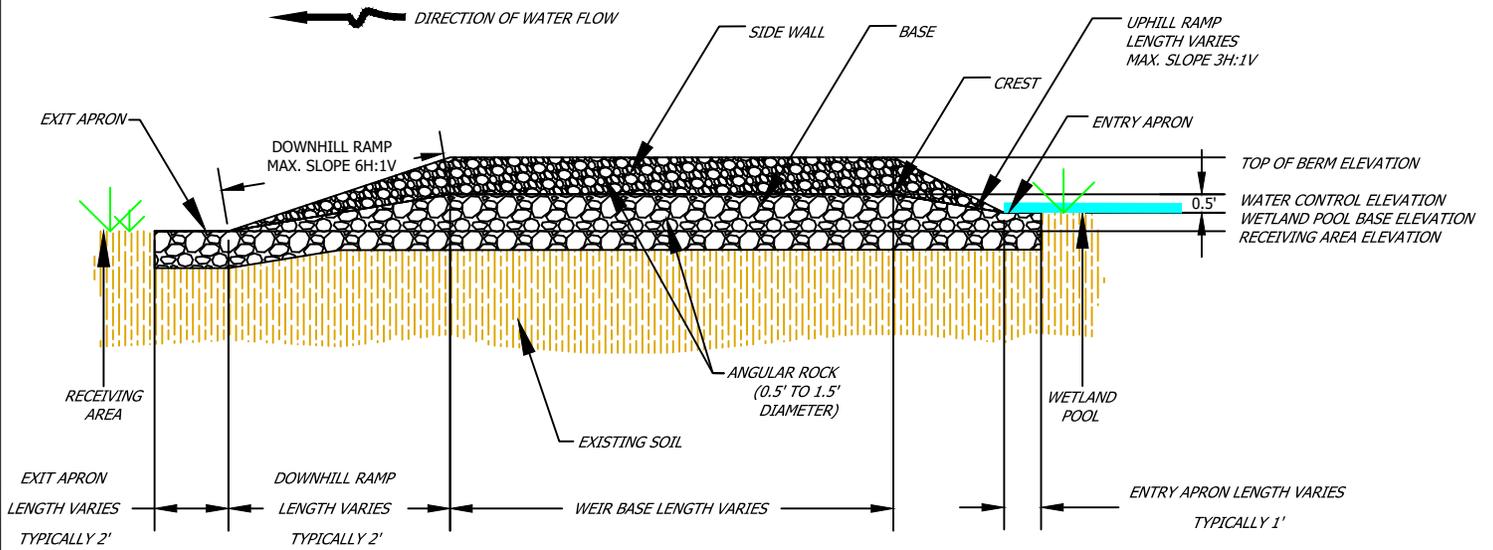
DRAWING DATE
FIG 7 JUN 2018



A1

**WETLAND POOL OUTLET
STRUCTURE
CROSS SECTION**

NOT TO SCALE



B1

**WETLAND POOL OUTLET
STRUCTURE
PROFILE**

NOT TO SCALE

Revisions		
No.	Description	Date

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Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

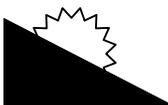
Typical Details:
Wetland Pool Rock Outlet
(Cross Section and Profile)

DRAWING	DATE
FIG 8	JUN 2018

Currently Unforested Riparian Buffer Restoration Tree and Shrub Planting List

Scientific Name	Common Name	Tree or Shrub
<i>Acer saccharinum</i>	Silver Maple	Tree
<i>Carya illinoensis</i>	Pecan	Tree
<i>Carya laciniosa</i>	Shell-Bark Hickory	Tree
<i>Celtis laevigata</i>	Sugar-Berry	Tree
<i>Celtis occidentalis</i>	Common Hackberry	Tree
<i>Diospyros virginiana</i>	Common Persimmon	Tree
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree
<i>Juglans nigra</i>	Black Walnut	Tree
<i>Platanus occidentalis</i>	American Sycamore	Tree
<i>Populus deltoides</i>	Eastern Cottonwood	Tree
<i>Quercus bicolor</i>	Swamp White Oak	Tree
<i>Quercus imbricaria</i>	Shingle Oak	Tree
<i>Quercus macrocarpa</i>	Burr Oak	Tree
<i>Quercus palustris</i>	Pin Oak	Tree
<i>Quercus shumardii</i>	Shumard's Oak	Tree
<i>Salix amygdaloides</i>	Peach-Leaf Willow	Tree
<i>Salix nigra</i>	Black Willow	Tree
<i>Ulmus americana</i>	American Elm	Tree
<i>Ulmus rubra</i>	Slippery Elm	Tree
<i>Amorpha fruticosa</i>	False Indigo Bush	Shrub
<i>Cephalanthus occidentalis</i>	Common Buttonbush	Shrub
<i>Cornus drummondii</i>	Rough-Leaf Dogwood	Shrub
<i>Cornus obliqua</i>	Swamp Dogwood	Shrub
<i>Sambucus nigra</i>	Black Elder	Shrub
<i>Salix interior</i>	Sandbar Willow	Shrub
<i>Symphoricarpos orbiculatus</i>	Coral-Berry	Shrub

Revisions		
No.	Description	Date



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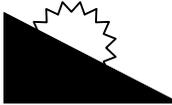
Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Planting and Seeding Lists
DR- ING D-TE
FIG 9 JUN 2018

Wetland Enhancement Planting List

Scientific Name	Common Name	Tree or Shrub
<i>Acer saccharinum</i>	Silver Maple	Tree
<i>Carya illinoensis</i>	Pecan	Tree
<i>Carya laciniosa</i>	Shell-Bark Hickory	Tree
<i>Celtis laevigata</i>	Sugar-Berry	Tree
<i>Diospyros virginiana</i>	Persimmon	Tree
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree
<i>Quercus bicolor</i>	Swamp White Oak	Tree
<i>Quercus palustris</i>	Pin Oak	Tree
<i>Quercus shumardii</i>	Shumard's Oak	Tree
<i>Salix nigra</i>	Black Willow	Tree
<i>Ulmus americana</i>	American Elm	Tree
<i>Ulmus rubra</i>	Slippery Elm	Tree
<i>Amorpha fruticosa</i>	False Indigo-Bush	Shrub
<i>Cephalanthus occidentalis</i>	Common Buttonbush	Shrub
<i>Salix interior</i>	Sandbar Willow	Shrub
<i>Sambucus nigra</i>	Black Elder	Shrub

Revisions		
No.	Description	Date



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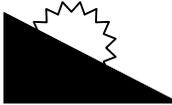
Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Planting and
Seeding Lists
DR- ING D-TE
FIG 10 | JUN 2018

Seeding List: Currently Unforested Riparian Buffer Restoration Areas and Currently Unforested Wetland Buffers

Scientific Name	Common Name	Scientific Name	Common Name
<i>Achillea millefolium</i>	Common Yarrow	<i>Heliopsis helianthoides</i>	Smooth Oxeye
<i>Andropogon gerardii</i>	Big Bluestem	<i>Juncus tenuis</i>	Lesser Poverty Rush
<i>Aquilegia canadensis</i>	Red Columbine	<i>Juncus torreyi</i>	Torrey's Rush
<i>Asclepias incarnata</i>	Swamp Milkweed	<i>Leersia oryzoides</i>	Rice Cut Grass
<i>Asclepias syriaca</i>	Common Milkweed	<i>Lespedeza capitata</i>	Round-Head Bush-Clover
<i>Asclepias tuberosa</i>	Butterfly Milkweed	<i>Liatris aspera</i>	Tall Blazing Star
<i>Asclepias verticillata</i>	Whorled Milkweed	<i>Liatris pycnostachya</i>	Cat-Tail Gayfeather
<i>Asclepias viridiflora</i>	Green Comet Milkweed	<i>Lilium michiganense</i>	Michigan Lily
<i>Baptisia alba</i>	White Wild Indigo	<i>Lobelia siphilitica</i>	Great Blue Lobelia
<i>Baptisia australis</i>	Blue Wild Indigo	<i>Ludwigia alternifolia</i>	Seedbox
<i>Bidens aristosa</i>	Bearded Beggarticks	<i>Lycopus americanus</i>	Cut-Leaf Water-Horehound
<i>Boltonia asteroides</i>	White Doll's Daisy	<i>Lythrum alatum</i>	Wing-Angle Loosestrife
<i>Bouteloua curtipendula</i>	Sideoats Grama	<i>Monarda fistulosa</i>	Oswego-Tea
<i>Calamagrostis canadensis</i>	Bluejoint	<i>Oenothera speciosa</i>	Pinkladies
<i>Carex frankii</i>	Frank's Sedge	<i>Panicum virgatum</i>	Switchgrass
<i>Carex grayi</i>	Gray's Sedge	<i>Penstemon digitalis</i>	Foxglove Beardtongue
<i>Carex hyalinolepis</i>	Shoreline Sedge	<i>Pycnanthemum tenuifolium</i>	Narrow-Leaf Mountain-Mint
<i>Carex scoparia</i>	Pointed Broom Sedge	<i>Ratibida columnifera</i>	Upright Prairie Coneflower
<i>Carex shortiana</i>	Short's Sedge	<i>Ratibida pinnata</i>	Pinnate Prairie Coneflower
<i>Carex stipata</i>	Stalk-Grain Sedge	<i>Rudbeckia hirta</i>	Black-Eyed Susan
<i>Carex vulpinoidea</i>	Common Fox Sedge	<i>Rudbeckia laciniata</i>	Green-Head Coneflower
<i>Chamaecrista fasciculata</i>	Sleepingplant	<i>Rudbeckia subtomentosa</i>	Sweet Coneflower
<i>Chasmanthium latifolium</i>	Indian Wood-Oats	<i>Rudbeckia triloba</i>	Brown-Eyed-Susan
<i>Coreopsis palmata</i>	Prairie Tickseed	<i>Salvia azurea</i>	Azure Blue Sage
<i>Coreopsis tripteris</i>	Tall Tickseed	<i>Schizachyrium scoparium</i>	Little Bluestem
<i>Cyperus esculentus</i>	Chufa	<i>Schoenoplectus tabernaemontani</i>	Soft-Stem Club-Rush
<i>Dalea candida</i>	White Prairie-Clover	<i>Scirpus atrovirens</i>	Dark-Green Bulrush
<i>Dalea purpurea</i>	Purple Prairie-Clover	<i>Senna marilandica</i>	Maryland Wild Sensitive-Plant
<i>Desmanthus illinoensis</i>	Prairie Bundle-Flower	<i>Silphium integrifolium</i>	Rosinweed
<i>Diarrhena obovata</i>	Hairy Beakgrain	<i>Silphium laciniatum</i>	Compassplant
<i>Drymocallis arguta</i>	Tall Cinquefoil	<i>Sium suave</i>	Hemlock Water-Parasnip
<i>Echinacea angustifolia</i>	Blacksamson Echinacea	<i>Solidago gigantea</i>	Late Goldenrod
<i>Echinacea pallida</i>	Pale Purple Coneflower	<i>Sorghastrum nutans</i>	Yellow Indian Grass
<i>Echinochloa muricata</i>	Rough Barnyard Grass	<i>Spartina pectinata</i>	Freshwater Cord Grass
<i>Eleocharis obtusa</i>	Blunt Spike-Rush	<i>Sporobolus compositus</i>	Tall Dropseed
<i>Eleocharis palustris</i>	Common Spike-Rush	<i>Sporobolus heterolepis</i>	Prairie Dropseed
<i>Elymus canadensis</i>	Nodding Wild Rye	<i>Symphotrichum laeve</i>	Smooth Blue American-Aster
<i>Elymus villosus</i>	Hairy Wild Rye	<i>Symphotrichum novae-angliae</i>	New England American-Aster
<i>Elymus virginicus</i>	Virginia Wild Rye	<i>Symphotrichum oblongifolium</i>	Aromatic Aster
<i>Eryngium yuccifolium</i>	Button Eryngo	<i>Symphotrichum oolentangiense</i>	Skyblue Aster
<i>Eupatorium perfoliatum</i>	Common Boneset	<i>Tradescantia ohioensis</i>	Bluejacket
<i>Eupatorium serotinum</i>	Late-Flowering Thoroughwort	<i>Tridens flavus</i>	Purpletop Tridens
<i>Eutrochium purpureum</i>	Sweet-Scented Joe-Pye-Weed	<i>Tripsacum dactyloides</i>	Eastern Mock Grama
<i>Helenium autumnale</i>	Fall Sneezeweed	<i>Verbesina alternifolia</i>	Wingstem
<i>Helianthus annuus</i>	Common Sunflower	<i>Vernonia baldwinii</i>	Baldwin's Ironweed
<i>Helianthus grosseserratus</i>	Saw-Tooth Sunflower	<i>Vernonia fasciculata</i>	Prairie Ironweed
<i>Helianthus maximilianii</i>	Maximilian Sunflower	<i>Veronicastrum virginicum</i>	Culver's-Root
<i>Helianthus mollis</i>	Ashy Sunflower	<i>Zizia aurea</i>	Golden Alexanders
<i>Helianthus tuberosus</i>	Jerusalem Artichoke	<i>Triticum x Agropyron</i>	Regreen Sterile Wheat (Cover Crop)

Revisions		
No.	Description	Date



Terra Technologies
6240 West 135th Street, Suite 100 Overland Park, KS 66223

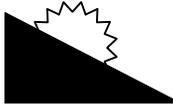
Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Planting and Seeding Lists
DR- ING D-TE
FIG 11 JUN 2018

Seeding List: Wetlands

Scientific Name	Common Name	Scientific Name	Common Name
<i>Alisma subcordatum</i>	American Water-Plantain	<i>Leersia oryzoides</i>	Rice Cut Grass
<i>Alisma triviale</i>	Northern Water-Plantain	<i>Liatris pycnostachya</i>	Cat-Tail Gayfeather
<i>Asclepias incarnata</i>	Swamp Milkweed	<i>Lobelia siphilitica</i>	Great Blue Lobelia
<i>Bidens aristosa</i>	Bearded Beggarticks	<i>Ludwigia alternifolia</i>	Seedbox
<i>Bidens cernua</i>	Nodding Burr-Marigold	<i>Ludwigia palustris</i>	Marsh Primrose-Willow
<i>Bidens frondosa</i>	Devil's-Pitchfork	<i>Lycopus americanus</i>	Cut-Leaf Water-Horehound
<i>Boltonia asteroides</i>	White Doll's Daisy	<i>Lythrum alatum</i>	Wing-Angle Loosestrife
<i>Calamagrostis canadensis</i>	Bluejoint	<i>Mimulus ringens</i>	Allegheny Monkey-Flower
<i>Carex bicknellii</i>	Bicknell's Sedge	<i>Panicum virgatum</i>	Switchgrass
<i>Carex frankii</i>	Frank's Sedge	<i>Penstemon digitalis</i>	Foxglove Beardtongue
<i>Carex grayi</i>	Gray's Sedge	<i>Penthorum sedoides</i>	Ditch-Stonecrop
<i>Carex hyalinolepis</i>	Shoreline Sedge	<i>Physostegia virginiana</i>	Obedient-Plant
<i>Carex hystericina</i>	Porcupine Sedge	<i>Sagittaria latifolia</i>	Duck-Potato
<i>Carex lupulina</i>	Hop Sedge	<i>Schoenoplectus acutus</i>	Hard-Stem Club-Rush
<i>Carex normalis</i>	Greater Straw Sedge	<i>Schoenoplectus fluviatilis</i>	River Club-Rush
<i>Carex scoparia</i>	Pointed Broom Sedge	<i>Schoenoplectus pungens</i>	Three-Square
<i>Carex shortiana</i>	Short's Sedge	<i>Schoenoplectus tabernaemontani</i>	Soft-Stem Club-Rush
<i>Carex stipata</i>	Stalk-Grain Sedge	<i>Scirpus atrovirens</i>	Dark-Green Bulrush
<i>Carex vulpinoidea</i>	Common Fox Sedge	<i>Scirpus pendulus</i>	Rufous Bulrush
<i>Cyperus esculentus</i>	Chufa	<i>Silphium perfoliatum</i>	Cup-Plant
<i>Echinochloa muricata</i>	Rough Barnyard Grass	<i>Sium suave</i>	Hemlock Water-Parsnip
<i>Eleocharis acicularis</i>	Needle Spike-Rush	<i>Solidago gigantea</i>	Late Goldenrod
<i>Eleocharis obtusa</i>	Blunt Spike-Rush	<i>Solidago rigida</i>	Hard-Leaf Flat-Top-Goldenrod
<i>Eleocharis palustris</i>	Common Spike-Rush	<i>Sparganium eurycarpum</i>	Broad-Fruit Burr-Reed
<i>Elymus virginicus</i>	Virginia Wild Rye	<i>Spartina pectinata</i>	Freshwater Cord Grass
<i>Eupatorium perfoliatum</i>	Common Boneset	<i>Symphotrichum lanceolatum</i>	White Panicked American-Aster
<i>Eupatorium serotinum</i>	Late-Flowering Thoroughwort	<i>Symphotrichum novae-angliae</i>	New England American-Aster
<i>Helenium autumnale</i>	Fall Sneezeweed	<i>Tradescantia ohiensis</i>	Bluejacket
<i>Hibiscus laevis</i>	Halberd-Leaf Rose-Mallow	<i>Verbena hastata</i>	Simpler's-Joy
<i>Iris virginica</i>	Virginia Blueflag	<i>Veronicastrum virginicum</i>	Culver's-Root
<i>Juncus dudleyi</i>	Dudley's Rush	<i>Zizia aurea</i>	Golden Alexanders
<i>Juncus torreyi</i>	Torrey's Rush	<i>Triticum x Agropyron</i>	Regreen Sterile Wheat (Cover Crop)

Revisions		
No.	Description	Date



Terra Technologies
6240 West 135th Street, Suite 100 Overland Park, KS 66223

Nishnabotna / Platte EDU
Umbrella Mitigation Bank
Site 2 - Pigeon Creek

Planting and Seeding Lists
DR- ING D-TE
FIG 12 | JUN 2018

APPENDIX D

FINANCIAL ASSURANCES: LETTER OF CREDIT EXAMPLE



September 1, 2017

Midwest Mitigation Oversight Association
21301 Shelby Lane
Belton, Missouri 64012

Gentlemen:

We hereby open our irrevocable credit in favor of the Midwest Mitigation Oversight Association for the sum or sums not to exceed a total of EIGHTEEN THOUSAND THREE HUNDRED AND TEN AND ZERO CENTS (\$18,310.00), to be made available by the request of the United States Army Corps of Engineers for payment at sight upon the presentation of a draft accompanied by the following statement:

“The undersigned certifies that a claim is presented against Swallow Tail, L.L.C., as it has been determined by the United States Army Corps of Engineers that Swallow Tail, L.L.C. has defaulted on some or all of the obligations, covenants, terms, and conditions of the Central Plains/Blackwater/Lamine EDU Umbrella Mitigation Bank Instrument, and the amount of the drawing will be used to implement corrective measures for the mitigation site. Under Letter of Credit No. 75201211-75028, we are providing this documentation instructing Country Club Bank to pay proceeds in the amount of \$18,310.00 (or a lesser amount determined by the United States Army Corps of Engineers to be sufficient to bring the mitigation project back into compliance with its Mitigation Banking Instrument) to the Midwest Mitigation Oversight Association to direct the activities requested by the United States Army Corps of Engineers. Please wire said proceeds to the Midwest Mitigation Oversight Association’s current account at the financial institution of its choice.”

This Letter of Credit must remain valid until Swallow Tail, L.L.C. receives a letter of notification from the United States Army Corps of Engineers stating that Swallow Tail, L.L.C. has met all of the success criteria as well as all of the terms and conditions contained within the Central Plains/Blackwater/Lamine EDU Umbrella Mitigation Bank Instrument and Bank Development Plan or until all compensatory mitigation credits have been sold at the bank, whichever is later.

The annual expiration date for this Letter of Credit is September 1, 2018. **However, this Letter of Credit is automatically renewable for each subsequent year, following annual expiration, until such time that the United States Army Corps of Engineers provides the letter of notification releasing Swallow Tail, L.L.C. from its requirement to maintain this Letter of Credit at Country Club Bank.** Country Club Bank and Swallow Tail, L.L.C. will notify the United States Army Corps of Engineers, annually, that the value of the required Letter of Credit is in full force and effect for the annual renewal period. Swallow Tail, L.L.C. and/or Country Club Bank must notify the United States Army Corps of Engineers immediately upon the commencement of any bankruptcy proceedings. This notification must be sent to United States Army Corps of Engineers, 635 Federal Building, 601 East 12th Street, Kansas City, Missouri 64106-2824 (Attn: OD-R, Suite 402).

If Country Club Bank can no longer provide a valid Letter of Credit, the Corps of Engineers and Swallow Tail, L.L.C. must be notified at least 60-days prior to the annual, or any other, expiration date of the current Letter of Credit.

This Letter of Credit is subject to the Uniform Customs and Practice for Documentary Credits, 2007 Revision, ICC Publication No. 600.

Any notice required hereunder will be deemed to have been given when received by you.

COUNTRY CLUB BANK



Bryan Mallory
Regional President

APPENDIX E

SITE PROTECTION INSTRUMENT EXAMPLE

CONSERVATION EASEMENT

THIS DEED OF CONSERVATION EASEMENT is given this _____ day of _____, 20____, by _____, having an address of _____ ("Grantor") to _____, having an address of _____ ("Grantee"). As used herein, the term "Grantor" shall include any and all heirs, successors, or assigns of the Grantor, and all subsequent owners of the Property (as hereinafter defined), and the term "Grantee" shall include any successor or assignee of Grantee.

WITNESSETH:

WHEREAS, Grantor is the sole owner in fee simple title of certain lands situated in _____ County, Missouri, more particularly described in Exhibit A, attached hereto and incorporated herein ("Property"); and

WHEREAS, Department of the Army (DA) Regulatory Action No. _____ of the U.S. Army Corps of Engineers ("Corps") (hereinafter referred to as the "Regulatory Action") authorizes certain activities which affect waters of the United States; and

WHEREAS, this Regulatory Action requires that Grantor preserve, enhance, restore, or mitigate wetlands or uplands located on the Property; and

WHEREAS, Grantor, in consideration of the authorization of this Regulatory Action to construct and operate the permitted activity, and as an inducement to the authorization of the Regulatory Action, is willing to grant a perpetual Conservation Easement over the Property; and

NOW THEREFORE, in consideration of the above and mutual covenants, terms conditions, and restrictions contained herein, together with other good and valuable consideration, the adequacy and receipt of which is hereby acknowledged, Grantor hereby voluntarily grants and conveys a perpetual Conservation Easement for and in favor of Grantee upon the property, which shall run with the land and be binding upon the Grantor, and shall remain in full force and effect forever.

The scope, nature, and character of this Conservation Easement shall be as follows:

1. **Purpose:** The purpose of this Conservation Easement is to retain and maintain land or water areas on the Property in their natural, vegetative, hydrologic, scenic, open, or wooded condition and to retain such areas as suitable habitat for fish, plants, or wildlife. Those wetland or upland areas that are to be restored, enhanced, created, or preserved on the Property shall be retained and maintained in the restored, enhanced, created, or preserved condition as described in the Regulatory Action and/or in the associated compensatory mitigation plan for the Property.

2. **Rights of Grantee:** The following rights are conveyed to the Grantee and to the Corps by this easement:

a. The right to take action to preserve and protect the environmental value of the Property; and

b. The right to prevent any activity on or use of the Property that is inconsistent with the purpose of this Conservation Easement, and to require the restoration of areas or features of the Property that may be damaged by any inconsistent activity or use;

c. The right to enter upon and inspect the Property in a reasonable manner and at reasonable times to determine if Grantor is complying with the covenants and prohibitions contained in this Conservation Easement; and

d. The right to proceed at law or in equity to enforce the provisions of this Conservation Easement, and to prevent the occurrence of any of the prohibited activities hereinafter set forth.

3. Prohibited Uses: Except for restoration, creation, enhancement, preservation, maintenance, and monitoring activities, or surface water management improvements, required by the Regulatory Action, or required by the compensatory mitigation plan, or are otherwise approved by the Corps, the following activities are prohibited on the Property:

a. Construction of any structure or object (i.e., buildings, roads, above or below ground utilities, signs, billboards etc.) without written approval from the Corps of Engineers prior to construction;

b. Dumping or placing of soil or other substance or material as landfill, or dumping or placing of trash, waste, or unsightly or offensive materials;

c. Removal or destruction of trees, shrubs, or other vegetation, except for the removal of nuisance, exotic, or non-native vegetation in accordance with a maintenance plan approved by Corps;

d. Planting of nuisance, exotic, or non-native plants as listed by the State of Missouri;

e. Exploration for, or extraction of, oil or gas in such a manner as to affect the surface, or excavation, dredging, or removal of coal, loam, peat, gravel, soil, rock, or other material substance;

f. Use of motorized and non-motorized vehicles, the keeping or riding of horses, grazing, livestock confinement, or other surface use that may affect the natural condition of the Property, except for vehicle use for purposes of maintenance and upkeep;

g. Tilling, plowing, planting of crops, digging, mining, or other activities that are or may be detrimental to drainage, flood control, water conservation, water quality, erosion control, soil conservation, or fish and wildlife habitat preservation, including but not limited to ditching, diking, and fencing;

h. The extraction of water from the Property or the impoundment of water on the Property so as to affect the hydrology of the Property;

i. Acts or uses detrimental to the aforementioned retention and maintenance of land or water areas;

j. Acts or uses detrimental to the preservation of the structural integrity or physical appearance of sites or properties of historical, architectural, archaeological, or cultural significance.

4. **Reserved Rights:** Grantor reserves all rights as owner of the Property, including the right to engage in uses of the Property that are not prohibited herein, and that are not inconsistent with the intent and purposes of this Conservation Easement.

5. **Taxes:** Grantor shall pay any and all applicable real property taxes and assessments levied by competent taxing authority on the Property.

6. **Maintenance:** Grantor shall, at Grantor's sole expense, operate, maintain and keep up the Property consistent with the purpose of this Conservation Easement. Grantor shall remove from the Property any nuisance, exotic, or non-native plants as listed by the State of Missouri and shall maintain the hydrology of the Property as it currently exists or as otherwise required by the Regulatory Action or as required by the compensatory mitigation plan or as required by the Corps approved final mitigation banking instrument.

7. **Hazardous Waste:** Grantor covenants that if any hazardous substances or toxic waste exist or has been generated, treated, stored, used, disposed of, or deposited in or on the Property, or there are or have been any underground storage tanks on the Property, Grantor shall be responsible for any and all necessary costs of remediation.

8. **Public Access:** No right of access by the general public to any portion of the Property is conveyed by this Conservation Easement, and Grantor further covenants not to hold any portion of the Property open to general use by the public except with the written permission of the Corps [and Grantee].

9. **Liability:** Grantor shall continue to retain all liability for any injury or damage to the person or property of third parties that may occur on the Property arising from ownership of the Property. Neither Grantor, nor any person claiming by or through Grantor, shall hold Grantee liable for any damage or injury that may occur on the Property.

10. **Recording Requirements:** Grantor must record this Conservation Easement in the official records of _____ County, Missouri, and shall re-record it at any time Grantee or the Corps may require to preserve their rights. Grantor shall pay all recording costs, fees and taxes necessary at any time to record this Conservation Easement in the public records. Grantor shall thereafter insert the terms and restrictions of this Conservation Easement in any subsequent deed or other legal instrument by which Grantor divests himself/herself/itself of any interest in

the Property, and shall provide a photocopy of the recorded Conservation Easement to the new owner(s).

11. **Enforcement:** The terms and conditions of this Conservation Easement may be enforced in an action at law or equity by the Grantee or the Corps against the Grantor violating or attempting to violate these Restrictions. Venue for any such action shall be in _____ County, Missouri. Enforcement of this Conservation Easement shall be at the reasonable discretion of the Grantee or the Corps, and any forbearance on behalf of Grantee or the Corps to exercise its or their rights hereunder in the event of any breach by Grantor shall not be deemed or construed to be a waiver of rights. Any costs incurred in enforcing, judicially or otherwise, the terms, provisions, and restrictions of this Conservation Easement, including without limitation, the costs of suit, and attorney's fees, shall be borne by and recoverable against the non-prevailing party in such proceedings, except that such costs shall not be recoverable against the Corps. In addition, if the Grantee or the Corps shall prevail in an enforcement action, such party shall also be entitled to recover that party's cost of restoring the land to the natural vegetative and hydrologic condition existing at the time of execution of these Restrictions or to the vegetative and hydrologic condition required by the Regulatory Action and/or as required by the associated compensatory mitigation plan.

12. **Assignment of Rights:** Grantee shall hold this Conservation Easement exclusively for conservation purposes. Grantee will not assign its rights and obligations under this Conservation Easement, except to another legal entity qualified to hold such interests under applicable state and federal laws and committed to holding this Conservation Easement exclusively for the purposes stated herein. Grantee shall notify the Corps in writing of any intention to reassign this Conservation Easement to a new grantee at least sixty (60) days in advance thereof, and the Corps must accept the assignment in writing. The new grantee shall then deliver a written acceptance to the Corps. The assignment instrument must then be recorded and indexed in the same manner as any other instrument affecting title to real property and a copy of the assignment instrument shall be furnished to the Corps. Failure to comply with the assignment procedure herein stated shall result in invalidity of the assignment. In the event of dissolution of the Grantee or any successor, or failure for 60 days or more to execute the obligations of this Conservation Easement, the Grantee shall transfer this Conservation Easement to a qualified and willing grantee. Upon failure of the Grantee or any successor to so transfer the Conservation Easement, the Corps shall have the right to sue to force such an assignment to a grantee to be identified by the Court.

13. **Successors:** The covenants, terms, conditions, and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of the parties hereto and their respective personal representatives, heirs, successors, and assigns, and shall continue as a servitude running in perpetuity with the Property.

14. **Notices:** All notices, consents, approvals, or other communications hereunder shall be in writing and shall be deemed properly given if sent by United States certified mail, return receipt requested, addressed to the appropriate party or successor-in-interest.

15. **Severability:** If any provision of this Conservation Easement or the application thereof to any person or circumstances is found to be invalid, the remainder of the provisions of this Conservation Easement shall not be affected thereby, as long as the purpose of the Conservation Easement is preserved.

16. **Alteration or Revocation:** This Conservation Easement, granted in perpetuity, may be amended, altered, released, canceled, or revoked only by written agreement between the parties hereto or their heirs, assigns, or successors in interest, which shall be filed in the public records of _____ County, Missouri. No action shall be taken, however, without advance written approval thereof by the Corps. Corps approval shall be by letter attached as an exhibit to the document amending, altering, canceling, or revoking the Conservation Easement, and said letter shall be informal and shall not require notarization. It is understood and agreed that Corps approval requires a minimum of sixty (60) days written notice, and that the Corps may require substitute or additional mitigation, a separate conservation easement or alternate deed restrictions, or other requirements as a condition of approval. Any amendment, alteration, release, cancellation, or revocation together with written Corps approval thereof shall then be filed in the public records of _____ County, Missouri, within 30 days thereafter.

17. **Controlling Law:** The interpretation and performance of this Conservation Easement shall be governed by the laws of the State of Missouri.

GRANTOR FURTHER COVENANTS that Grantor is lawfully seised of said Property in fee simple; that the Property is free and clear of all encumbrances that are inconsistent with the terms of this Conservation Easement and that no mortgages or other liens exist; that Grantor has good right and lawful authority to convey this Conservation Easement, and that it hereby fully warrants and defends the title to the Conservation Easement hereby conveyed against the lawful claims of all persons whomsoever.

TO HAVE AND TO HOLD, the Grantor covenants that he, she, or they are vested with good title to the easement area and will warrant and defend the same on behalf of the Grantee against all claims and demands. The Grantor covenants to comply with the terms and conditions enumerated in this document for the use of the easement area and adjacent lands for access, and to refrain from any activity not specifically allowed or that is inconsistent with the purposes of this easement deed. The covenants, terms, conditions, restrictions, and purpose imposed with this Conservation Easement shall be binding upon Grantor, and shall continue as a servitude running in perpetuity with the Property.

Dated this _____ day of _____, 20 _____

Grantor(s): _____
Print Name

Signature

Signature(s) continued:

Print Name

Signature

ACKNOWLEDGEMENT

STATE OF MISSOURI

COUNTY OF _____

On this ____ day of _____ in the year 20____, before me, the undersigned notary public, personally appeared _____, known to me to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged that he/she/they executed the same for the purposes therein contained. In witness whereof, I hereunto set my hand and official seal.

Notary Public
Residing at _____

My Commission
Expires _____

ACCEPTANCE BY GRANTEE:

I _____ (print name), _____ (title), being the duly authorized representative of the Grantee, do hereby accept this Conservation Easement Deed with respect to the rights and duties of the, Grantee.

Dated this ____ day of _____, 20 ____.

Signature

Title

APPENDIX F

MISSOURI STATE HISTORIC PRESERVATION OFFICE CORRESPONDENCE



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

April 24, 2017

David Flick
Swallow Tail LLC
24820 Miller Road
Harrisonville, Missouri 64701

Re: Pidgeon Creek Project (COE) Buchanan County, Missouri

Dear Mr. Flick:

Thank you for submitting information on the above referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which requires identification and evaluation of cultural resources.

We have reviewed the April 2017 report entitled *Cultural Resource Investigations, Phase I Survey, Pidgeon Creek Project, Buchanan County, Missouri* by the Environmental Research Center of Missouri, Inc. Based on this review it is evident that a thorough and adequate cultural resources survey has been conducted of the project area. We concur that archaeological sites 23BN1140, 23BN1141, 23BN1142, 23BN1143, and the barn are not eligible for inclusion in the National Register of Historic Places, and that the Bridge over Pidgeon Creek should be considered unevaluated at this time. There will be **no historic properties affected** and, therefore, we have no objection to the initiation of project activities.

Please be advised that, should project plans change, information documenting the revisions should be submitted to this office for further review. In the event that cultural materials are encountered during project activities, all construction should be halted, and this office notified as soon as possible in order to determine the appropriate course of action.

If you have any questions, please write Judith Deel at State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102 or call 573/751-7862. Please be sure to include the SHPO Log Number **(031-BN-17)** on all future correspondence or inquiries relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Toni M. Prawl, Ph.D.
Director and Deputy State
Historic Preservation Officer

TMP:jd

c Amber Tilley, EPA
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