

TERRA TECHNOLOGIES

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# Prospectus Mitigation Banking Instrument

For the  
**Nishnabotna / Platte EDU  
Wetland & Stream  
Umbrella Mitigation Bank**



October 2014

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**TABLE OF CONTENTS**

**I. INTRODUCTION..... 1**

**II. OBJECTIVES ..... 1**

**III. ESTABLISHMENT AND OPERATION..... 2**

**IV. SERVICE AREA..... 7**

**V. GENERAL NEED AND TECHNICAL FEASIBILITY..... 8**

**VI. CURRENT AND LONG-TERM OWNERSHIP ARRANGEMENTS AND LONG-TERM MANAGEMENT STRATEGY..... 11**

**VII. SPONSOR QUALIFICATIONS ..... 13**

**VIII. ECOLOGICAL SUITABILITY..... 14**

**IX. WATER RIGHTS, MINERAL RIGHTS & EXISTING REAL ESTATE ENCUMBRANCES..... 14**

**X. REFERENCES..... 15**

**APPENDICES**

- Appendix A: Financial Assurances: Letter of Credit Example**
- Appendix B: Site Protection Instrument Example**
- Appendix C: Sponsor Qualifications**

**TERRA TECHNOLOGIES**



## I. INTRODUCTION

Swallow Tail, LLC (the Sponsor) is proposing to establish the Nishnabotna / Platte EDU Wetland & Stream Umbrella Mitigation Bank (the Bank) which will describe the establishment and operation of individual wetland and/or stream mitigation sites (mitigation sites) within the watershed service area in northwest Missouri. The Final Umbrella Mitigation Banking Instrument will define general guidelines applicable to all mitigation sites authorized as part of the Bank but certain site-specific details will be included in the mitigation plan for each mitigation site. These mitigation plans will become attachments to this umbrella mitigation banking instrument upon approval. The establishment of this umbrella mitigation bank will streamline the production of the Sponsor's mitigation plans and reduce regulatory workloads in the watershed service area in comparison to the establishment of multiple separate mitigation banking instruments. Consequently, mitigation sites will be more rapidly developed which will be beneficial to water quality and wildlife habitat, as well as being of service to the regulated public.

## II. OBJECTIVES

The objectives of this proposed umbrella mitigation bank are: 1) to provide appropriate compensatory mitigation for impacts to jurisdictional aquatic habitats such as streams and wetlands authorized under Sections 404 and 401 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899 within the watershed service area and, 2) to improve the water quality and wildlife habitat functions provided by the mitigation sites in a manner that would simultaneously address the specific mitigation needs of the mitigation sites and the larger aquatic needs of the watershed. This would be done by re-establishing the native habitats that would have likely existed on the mitigation sites before agricultural conversion and by increasing the quantity and quality of stream, wetland, buffer and upland habitat and the associated ecosystem functions. Typical anticipated mitigation activities include addressing stream bed and bank instability; reversing past stream channelization efforts by restoring natural stream channel alignment and/or cross section; riparian buffer restoration and enhancement; wetland restoration, rehabilitation, establishment and enhancement; and buffer and upland establishment and enhancement. The Sponsor shall then legally protect the mitigation sites as natural habitat in perpetuity.



### III. ESTABLISHMENT AND OPERATION

#### A. Umbrella Mitigation Bank Operation & Document Organization

The Final Umbrella Mitigation Banking Instrument will serve as a binding agreement regarding the establishment, use, operation and maintenance of the Bank and is made and entered into, by, and among the Sponsor and the members of the Interagency Review Team (the IRT). The IRT is chaired by the Kansas City District of the U.S. Army Corps of Engineers (the Corps) and will also include as members the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), the Missouri Department of Natural Resources (MDNR) and the Missouri Department of Conservation (MDC).

The Final Umbrella Mitigation Banking Instrument will become valid on the date of the last signatory's signature. The Final Umbrella Mitigation Banking Instrument may be amended or modified with the written approval of all signatory parties as described in the Mitigation Rule at 33 CFR Part 332.8(d). The addition and approval of mitigation sites and the expansion of previously approved mitigation sites will be included as modifications (*i.e.*, attachments) to the Final Umbrella Mitigation Banking Instrument using the procedures described in the Mitigation Rule at 33 CFR Part 332.8(g)(1). Any of the IRT members may terminate their participation upon written notification to all signatory parties. Participation of the IRT members will terminate 30 days after written notification.

After Corps and IRT approval of mitigation sites the Sponsor shall perform the mitigation activities described in the mitigation plan of each mitigation site or as shown in any subsequent As-Built Figures and shall operate all mitigation sites in accordance with the provisions of the Final Umbrella Mitigation Banking Instrument and the corresponding mitigation plan. The Sponsor shall receive wetland credits and stream credits upon satisfaction of the ecological performance standards outlined in the Final Umbrella Mitigation Banking Instrument and/or the mitigation plan of each mitigation site. After all ecological performance standards have been met and after all credits have been released to the Sponsor, the Bank will have received the total number of wetland credits and stream credits stated in the mitigation plan of each mitigation site to use as compensatory mitigation for impacts to waters of the U.S., including wetlands, authorized by Sections 404 and 401 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. The amount of stream credits granted to the Sponsor will be determined by the Corps and IRT and will be proportionate to the amount of functional lift accomplished at the site which will be calculated through the use of the 2013 Missouri Stream Mitigation Method (U.S. Army Corps of Engineers, 2013a) or any subsequently approved method of credit assessment. Wetland credits will be determined on an acreage



basis depending on the type of mitigation activity (establishment, rehabilitation or enhancement) unless a new method of wetland credit assessment is adopted after the approval of the Final Umbrella Mitigation Banking Instrument. Credits will be sold to third parties at appropriate market rates to be determined by the Sponsor. The sale of these wetland credits and stream credits available at the mitigation sites only pertain to the mitigation requirements of the Department of the Army permit issued under the authorities of Section 404 of the Clean Water Act and/or under Section 10 of the Rivers and Harbors Act of 1899 and any associated Section 401 water quality certification as administered by the State of Missouri. Additional mitigation requirements may be necessary to comply with other federal, state, and/or local statutes and regulations. Per Corps' and EPA's joint regulation for *Compensatory Mitigation for Losses of Aquatic Resources* (the Mitigation Rule) at 33 CFR 332.3(j)(1)(ii), proposed mitigation activities may address requirements of multiple regulatory programs and authorities for the same activity.

This Prospectus addresses all requirements of a complete Prospectus as described in the Corps' *Mitigation Banking Instrument Outline for Proposed Mitigation Banks within the State of Missouri* (U.S. Army Corps of Engineers, 2013) in addition to some supplemental information provided by the Sponsor. After this Prospectus has been placed on Public Notice and the public comments have been submitted to the Sponsor, the Sponsor will address those comments and submit the Draft Umbrella Mitigation Banking Instrument which will contain the necessary information required by the *Mitigation Banking Instrument Outline for Proposed Mitigation Banks within the State of Missouri*, including but not limited to baseline information, determination of credits, mitigation work plan, ecological performance standards, monitoring requirements, management plans, financial assurances, credit release schedule and default and closure provisions. An example letter of credit that would be used as financial assurances is included in Appendix A. The Corps and IRT will then have the opportunity to comment on the Draft Umbrella Mitigation Banking Instrument. The Sponsor will then incorporate the comments into the document and submit the Final Umbrella Banking Instrument for Corps and IRT review.

The main body of the Final Umbrella Banking Instrument will discuss how the Bank will be established and operated and will include the following:

- Location
- Establishment and Operation
- Current and Long-Term Ownership Arrangements and Long-Term Management Strategy
- Sponsor Qualifications
- Legal Responsibility for Compensatory Mitigation
- Watershed Approach
- Service Area



- Mitigation Plan Guidelines
  - Objectives
  - Site Selection (General Discussion of Prioritization Criteria)
  - Site Protection Instrument
  - Determination of Credits (Methodology)
  - Operation and Maintenance Plan Guidelines
  - Common Ecological Performance Standards (Wetland Hydrology, Hydrophytic Vegetation, Hydric Soils, Desirable Vegetative Cover, Tree & Shrub Survival, Invasive Species, *etc.*)
  - Monitoring Requirement Guidelines
  - Long-Term Management Plan Guidelines
  - Adaptive Management Plan Guidelines
  - Financial Assurance Guidelines
- Credit Release Schedule Guidelines
- Accounting Procedures
- Reporting
- Default and Closure

The mitigation plans for each mitigation site will be attachments to the Final Umbrella Banking Instrument. These mitigation plans will include the following:

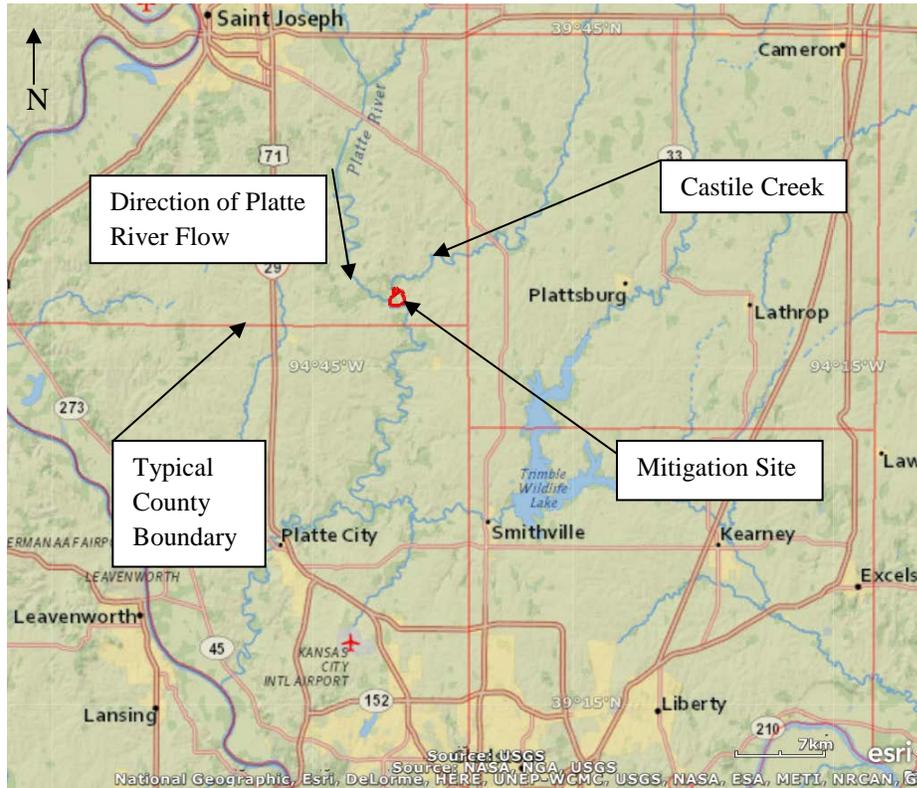
- Location (Including Map[s] and Shapefile)
- Objectives
- Site Selection (Including Descriptions of Existing Easements and Documentation of Acquisition and Protection of Water Rights)
- Site Protection Instrument (If Different Than Instrument Main Body)
- Baseline Information
- Determination of Credits
- Mitigation Work Plan
- Operation and Maintenance Plan
- Site-Specific Ecological Performance Standards (If Different Than Instrument Main Body)
- Site-Specific Monitoring Requirements (If Different Than Instrument Main Body)
- Site-Specific Long-term Management Plan (Including Legal Mechanism & Responsible Party)
- Site-Specific Adaptive Management Plan
- Financial Assurances
- Credit Release Schedule
- Other Information Required by the Corps



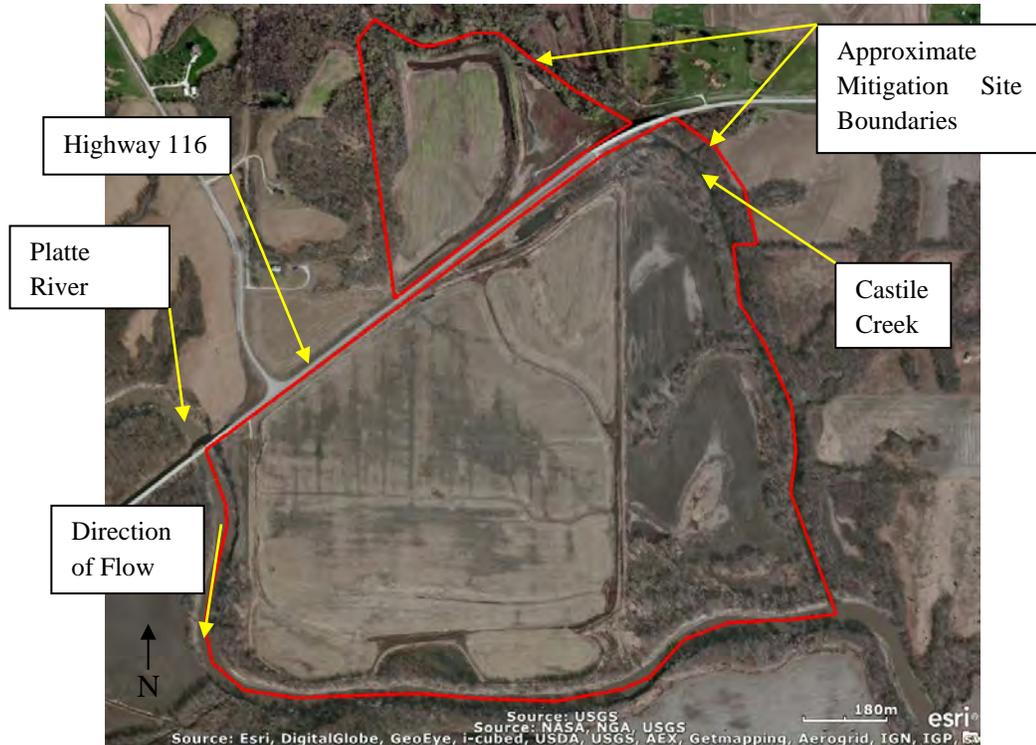
B. Initial Mitigation Site

The Sponsor has an initial mitigation site within the service area whose mitigation plan will be included in the Bank’s Draft Mitigation Banking Instrument. The proposed Castile Creek Wetland & Stream Mitigation Site is approximately 299.80 acres in size and is located in the southeastern corner of Buchanan County, Missouri, at the confluence of the Platte River and Castile Creek. This mitigation site consists of agricultural lands bisected by Missouri Highway 116. This location is shown below in Figure 1 (ESRI, 2014a). Figure 2 shows an aerial photograph of the Bank along with its proposed boundaries (ESRI, 2014).

**Figure 1. Castile Creek Wetland & Stream Mitigation Site Location**



**Figure 2. Castile Creek Wetland & Stream Mitigation Site  
Aerial Photograph with Approximate Boundaries**



The agricultural conversion of the Castile Creek Wetland & Stream Mitigation Site decreased the quantity and quality of wetland, in-stream, riparian and upland natural habitats on the site. 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 1.5 miles of levees have been built to significantly reduce flooding on more than 170 acres of the Platte River and Castile Creek floodplains, actions that had substantial ramifications to stream and riparian ecosystem functioning. In addition, the crop production on the site has contributed to the impaired water quality of the Platte River, Castile Creek and downstream waters by increasing sediment, chemical and nutrient inputs.

Beyond the aquatic ecosystem functions gained through the restoration, establishment, enhancement and rehabilitation of hundreds of acres of riparian buffer, wetland and upland habitat, the Castile Creek Wetland & Stream Mitigation Site offers some exceptional opportunities for mitigation. These include breaching the Platte River and Castile Creek levees to restore floodplain connectivity to much of the site and restoring natural alignment and cross section to several floodplain ephemeral streams that have been previously removed or degraded by agricultural activities and levee construction.

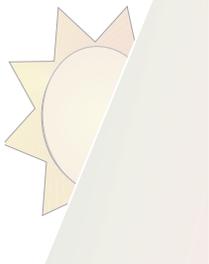


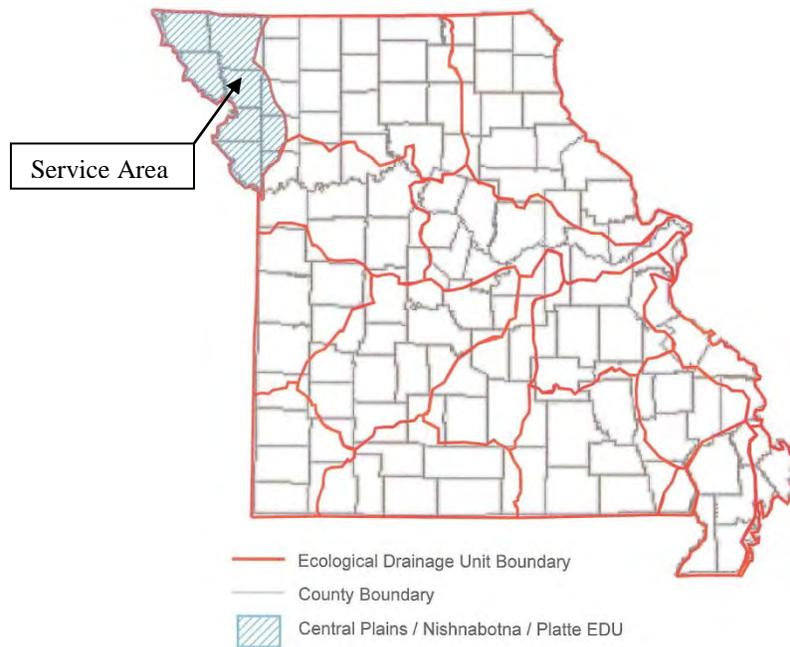
In addition, mitigation on Castile Creek is encouraged because that waterway qualifies as a primary priority area under the Missouri Stream Mitigation Method due to its status as a Designated Fish Spawning Area. This primary priority area designation is granted to "...streams [that] provide important contributions to biodiversity on an ecosystem scale or high levels of function contributing to landscape or human values" (U.S. Army Corps of Engineers, 2013a). Also, the portion of the Bank along Castile Creek south of Highway 116 was considered by MDC as a high-level priority for their acquisition in order to protect the stream frontage within that area (Bayless & Travnichek, n.d., Table Lu05). Moreover, in their watershed inventory and assessment for the Platte River, MDC stated that they would focus their resources to preserve and improve riparian buffers within that watershed along Castile Creek and parts of Honey Creek because both of those streams have habitats unique within the Platte River basin (Bayless & Travnichek, n.d.).

For all of the reasons stated above, the Castile Creek Wetland & Stream Mitigation Site has significant potential for wetland and stream mitigation. Additional details will be provided as a mitigation plan attachment to the Bank's Draft Mitigation Banking Instrument.

#### **IV. SERVICE AREA**

The proposed service area of the Bank is the portion of the Central Plains / Nishnabotna / Platte Ecological Drainage Unit (EDU) within Missouri. This service area consists of the watershed of the Missouri River between the northwestern corner of the state to near downtown Kansas City. The primary tributaries to the Missouri River in this service area include the Nishnabotna River, the Tarkio River, the Nodaway River, the One Hundred and Two River, and the Platte River. The boundaries of this service area are shown below in Figure 3.



**Figure 3. Service Area Boundaries**

On a case-by-case basis the Corps, in consultation with the IRT, may approve mitigation credits to be sold to offset impacts from Department of the Army permit impacts that occur outside this service area. If determined appropriate, the Corps will determine the number of credits needed to be purchased in order to adequately replace the aquatic resources lost at the Department of the Army permit site.

The EDUs within Missouri generally consist of the state's major watersheds. They are combinations of 8-digit Hydrologic Unit Code (HUC) watersheds grouped together because of a common drainage area, geomorphology and aquatic species assemblages. As a result, all areas within an EDU contain aquatic species that are evolutionarily divergent from those in neighboring EDUs because of the distinct aquatic habitats that are unique to each EDU (Sowa *et al.*, 2005). The concept of EDUs was originated by The Nature Conservancy's Freshwater Initiative with the goal of creating a meaningful geographic unit of ecologically similar drainage basins within which restoration and conservation sites can be selected to guarantee that target species and habitats are characterized across important environmental gradients. This commonality between the aquatic habitats within each of these major drainages makes the EDU an appropriate watershed boundary unit for centralized mitigation within Missouri.

## V. GENERAL NEED AND TECHNICAL FEASIBILITY

The service area is a Missouri watershed shown to be in need of restoration. All states were required by the federal government to write a Unified Watershed Assessment in



order to formally measure and prioritize the restoration or protection need of water resources within all eight-digit HUC watersheds in each state. The State of Missouri Unified Watershed Assessment, which was created by a steering committee which included as members MDNR, the Center for Applied Research and Environmental Systems (CARES), the Natural Resources Conservation Service (NRCS), the U.S. Forest Service and the U.S. Department of Agriculture Farm Service Agency, ranked all of the 8-digit HUCs in Missouri in terms of restoration priorities with a specific focus on watersheds in greatest need of restoration. The results of this analysis placed the Platte River subbasin (HUC 10240012) that contains the Bank as the 18<sup>th</sup> highest restoration priority out of the 66 8-digit HUCs in Missouri and stated that this subbasin had a moderate probability of rehabilitation. The factors that influenced the prioritization of this subbasin include the fact that atrazine is a significant pollutant; the moderate biological impairment by channel alterations, sedimentation and nonpoint sources; the fact that there are three public drinking water intakes; a high cropland erosion index; and one lake on the 303(d) Total Maximum Daily Load list (Missouri Unified Watershed Assessment Steering Committee, 1998).

The Missouri Resource Assessment Partnership (MoRAP), a collection of University of Missouri employees who have produced a number of digital data and maps related to natural resources, has undertaken a thorough analysis of the type and severity of threats to aquatic resources throughout Missouri in order to create Human Stressor Index values for each small drainage area (Aquatic Ecological System). This analysis characterized the level of stress on riverine ecosystems across the state from eleven unique and fairly uncorrelated factors: percent urban cover, percent agricultural cover, number of introduced species, amount of hydrologic modification or fragmentation by major impoundments, population change between 1990 and 2000, number of small impoundments, density of stream road crossings, density of coal mines, density of NPDES permitted discharges, density of lead mines, and density of confined animal feeding operations (Sowa *et al.*, 2005). While this analysis was focused solely on riverine ecosystems, the results can be safely extrapolated to be applicable to all aquatic resources. This is because the same stressors act similarly on stream, wetland and open water habitats due to the ecological parallels between these systems and the close physical, chemical and biological relationships between neighboring aquatic habitats. Additionally, the results from each Aquatic Ecological System can be combined to provide a thorough presentation of the type and severity of threats to aquatic resources within each service area.

The aquatic resources in the proposed service area are highly stressed as almost all of the portion of the Central Plains / Nishnabotna / Platte EDU in Missouri is shown to be in the upper two levels of the Human Stressor Index. The locations of greatest aquatic stress are along the Nodaway River, the Missouri River downstream of its confluence with the



Nodaway River, the One Hundred and Two River watershed, and the upper Platte River watershed. All of these areas are ranked in the top level of overall Human Stressor Index (Sowa *et al.*, 2005).

Assessing the service area as a whole, the median value for each stressor shows a relatively high level of stress from agricultural activities, a moderate to high level of disturbance from stream road crossings and a moderate to low level of stress from the number of introduced species, small impoundments, and the density of permitted discharges with a relatively low level of disturbance from all other stressors. There was relatively little variation in the level of disturbance caused by each individual aquatic threat across the service area as almost all of the service area was impacted by agriculture at the highest level possible. The One Hundred and Two River watershed and the area around Milton have the greatest amount of disturbance possible from both agriculture and small impoundments and the Nodaway River watershed is severely impacted by agriculture and the density of stream road crossings. The Aquatic Ecological System that contains the virtually all of the portion of the Kansas City metropolitan area in the service area had the highest possible rating for the density of stream road crossings and also had a moderate to high amount of impacts from percent urban cover, population change (*i.e.*, land development), density of permitted discharges and number of small impoundments (Missouri Resource Assessment Partnership, 2005).

The conclusions of the MoRAP analysis are corroborated by those of MDC and MDNR. In its watershed inventories and assessments for the Platte and Nodaway Rivers, MDC found that the main water quality problems in the Platte River watershed are soil erosion from agricultural lands and stream banks, minimal riparian buffers and modified stream flow patterns because of agricultural conversion. Channelization and the creation of levees has been widespread in the assessed watersheds (and throughout this service area), resulting in the direct loss of aquatic habitat, downcutting, significant erosion, and the hydrologic disconnection of rivers from their floodplains. All of these problems are agricultural in nature as the impact of nonpoint sources of pollution far outweighs that of point sources in this service area (Bayless & Travnichek, n.d. & Horton, Bayless & Kerns, n.d.). Additionally, according to MDNR (1996), the major water quality areas of concern in this service area are:

- Atrazine and other herbicides are present in many drinking water reservoirs throughout the year (including Smithville Lake) and in streams used for potable water during summer and spring
- Industrial spills and inadequate waste disposal in certain parts of the Kansas City metropolitan area are leading to areas of groundwater contamination of the alluvial aquifers
- Channelization has impaired aquatic habitat quality throughout much of the Tarkio River, Nodaway River, Platte River, and One Hundred and Two River



Based on the findings described above, the main threat to aquatic resources in this service area is agriculture, followed by stream road crossings and to a lesser degree introduced species, small impoundments and the density of permitted discharges, with a relatively low level of disturbance from all other stressors at the watershed level. Impacts to aquatic resources resulting from agricultural activities include insufficiently wide riparian buffers; non-point source pollution of nutrients, herbicides and pesticides; the conversion of wetlands; stream channelization, excessive sediment loads, and livestock damage. In developed areas, aquatic resources are impacted by such threats as increases in surface water flows and resulting erosion, stream channelization, wetland conversion and water pollution from point and nonpoint sources. The mitigation activities proposed as part of the Bank will address these watershed needs by converting agricultural ecosystems to the natural habitats that likely previously existed on the site; significantly reducing invasive species cover; widening riparian buffers; establishing large wetland areas that will treat nutrient, chemical and sediment pollution; and restoring natural stream channel alignments and cross sections.

The proposed wetland and stream mitigation activities are technically feasible. As described later in this document, the Sponsor has a history of selecting mitigation sites that are ecologically suitable for stream and riparian buffer restoration. These locations have contained stretches of perennial, intermittent and ephemeral streams that have denuded and/or degraded riparian buffers and require in-stream restoration to re-establish proper channel cross section, remedy bank instability or reverse past channelization efforts which present great potential for restoring in-stream and riparian buffer habitat. In addition, the Sponsor's previously approved mitigation sites have had topography, soils and hydrology amenable to wetland restoration, establishment, rehabilitation and enhancement.

## **VI. CURRENT AND LONG-TERM OWNERSHIP ARRANGEMENTS AND LONG-TERM MANAGEMENT STRATEGY**

The Flick Family Irrevocable Trust will own the real estate containing each mitigation site, including the water rights and mineral rights, and the Sponsor will develop mitigation plans to establish, restore, rehabilitate, and enhance onsite streams, riparian buffers, wetlands, buffers and/or uplands at each mitigation site. There are no short-term or long-term plans to transfer title of each property to another party. It is the intention of the Sponsor to legally preserve the property as open space habitat in accordance with the terms of the long-term management plan included in the Final Umbrella Mitigation Banking Instrument and each mitigation site conservation easement. Conservation



easements will be the legal means to ensure that each mitigation site remains as natural habitat in perpetuity. The conservation easements shall prohibit any development of the site and shall stay with the mitigation site property in the instance that the title to the property is transferred to another party. A draft conservation easement is included in Appendix B. The terms of the easement will be enforceable by the Corps and the Midwest Mitigation Oversight Association, a non-profit group that will hold the conservation easement and will monitor the Sponsor's compliance with the conditions of the easement. After the mitigation site is approved, copies of the finalized and recorded conservation easement shall be provided to the Corps.

The Midwest Mitigation Oversight Association is a conservation-based non-profit corporation established in 2007 with the sole purpose of holding and monitoring natural resource mitigation conservation easements. The Midwest Mitigation Oversight Association has been approved by the Kansas City, St. Louis and Little Rock Districts of the U.S. Army Corps of Engineers as a legally-binding recipient of conservation easements for mitigation sites and currently holds easements on thousands of acres of federal mitigation parcels in Missouri and Kansas. The board of directors consists of professionals whom all meet stringent requirements in order to be on the board, including the possession of a broad scientific background related to natural resources, conservation science or applied ecology. These board members have more than fifty combined years of professional natural resource experience in wetland and stream regulations, habitat maintenance and construction.

The long-term management strategy for each mitigation site is to provide limited maintenance and management of the mitigation site as needed after all parties have determined that the mitigation site is successful and that more intensive monitoring and management is no longer necessary. Active management of each mitigation site will continue for a minimum of fifteen (15) years after approval of the mitigation site or until all credits from the mitigation site have been sold (unless the remaining credits are indefinitely suspended or removed), whichever is later. At that point, the ecosystems within the mitigation site will not require active management. Long-term management will commence at the end of the active management phase of mitigation site operation and will include continued maintenance of the mitigation site for purposes of such activities as controlling invasive species, maintaining water control berms, prevention of trespassing and removal of litter, as necessary. Costs associated with these activities will be paid for by the revenues from credit sales. It is the intent of the Sponsor to oversee the long-term management of each mitigation site in perpetuity, but should the Sponsor for any reason decide to transfer the long-term management of a mitigation site to a currently unknown entity, the Sponsor will notify the Corps prior to the transfer of the long-term management responsibilities. At that time the appropriate funding mechanism for a mitigation site, as outlined in the Mitigation Rule at 33 CFR 332.7(d), will be determined.



## VII. SPONSOR QUALIFICATIONS

The Sponsor operates five existing approved wetland and stream mitigation banks within the Kansas City District of the Corps. Project descriptions of these mitigation banks are included in Appendix C. These approved wetland and stream mitigation banks together encompass roughly 474 acres and include more than 150 acres of floodplain wetland establishment, restoration and enhancement as well as many acres of wetlands established within riparian buffers that function solely as stream mitigation. These approved mitigation banks have also legally protected both sides of almost 4.7 miles of streams and more than 3.25 miles of streams on one side and have expanded riparian buffers on these streams with more than 223 acres of new riparian buffer plantings. The Sponsor also has four proposed wetland and stream mitigation banks in the Corps' Kansas City District and two proposed wetland and stream mitigation banks in the Corps' Little Rock District under current review that are either entirely or partially constructed. The design, construction, management and monitoring of these proposed mitigation banks further demonstrates the Sponsor's qualifications to perform mitigation related to wetland, riparian, stream and upland habitats.

Specific to the design and construction of stream channel restoration projects, the Sponsor's approved Stranger Creek Wetland and Stream Mitigation Bank included the restoration of more than a half mile of two highly degraded farm ditches to their natural condition as intermittent stream channels with appropriate channel morphology and riparian buffers. Also as part of that project, a longitudinal peak stone toe bank stabilization was engineered and constructed along about 300 feet of Stranger Creek to address an area experiencing extreme erosion. In addition, willow plantings along perennial stream banks have been utilized at two of the Sponsor's approved mitigation banks in order to stabilize eroding stream banks utilizing natural methods.

Services related to project planning and design as well as construction oversight and monitoring of the Bank will be contracted to the scientists and engineers at Terra Technologies, Inc. (Terra Technologies). Terra Technologies is an environmental engineering company with offices in Leawood, Kansas and St. Louis, Missouri. The firm has significant experience with compensatory mitigation projects with approximately 600 successful mitigation sites in Kansas and Missouri since the company's founding in 1992. Additionally, Terra Technologies has extensive expertise in the planning, design and construction of large-scale wetland and stream mitigation projects as the firm has designed and overseen construction of all of the Sponsor's approved and proposed mitigation banks.

The licensed professional engineers and biologists at Terra Technologies have significant experience in stream design, restoration, stabilization and enhancement as they have

designed stream improvements for many waterways throughout Missouri and Kansas including projects for the City of Leawood, Kansas; the City of Overland Park, Kansas; the City of Merriam, Kansas; the City of Shawnee, Kansas; the City of Lawrence, Kansas; the City of Independence, Missouri; the City of Blue Springs, Missouri; the City of St. Charles, Missouri; the Metropolitan St. Louis Sewer District, and; the U.S. Army Corps of Engineers Kansas City District among many others. In addition, Terra Technologies was also awarded the Conservation Award in 1999 from the Kansas Department of Wildlife and Parks Environmental Services Section for their work with municipalities and private entities.

## VIII. ECOLOGICAL SUITABILITY

Each mitigation site will be ecologically suitable as a large-scale wetland and/or stream mitigation site because of its location, baseline conditions, and mitigation opportunities. All of these aspects will be discussed in the mitigation plan for each mitigation site. Each of the Sponsor's approved mitigation banks have been ecologically suitable for wetland and stream mitigation based upon an assessment of such characteristics as each site's stream mitigation priority status, proximity to existing protected natural areas, topography, floodplain limits, soils, existing wetland and stream locations and boundaries, degree of ecological degradation, and resulting mitigation opportunities. The same factors will be evaluated for each of the Bank's mitigation sites.

## IX. WATER RIGHTS, MINERAL RIGHTS & EXISTING REAL ESTATE ENCUMBRANCES

Missouri is a state governed by riparian doctrine water law. As such, river and stream flows are not treated as property to be owned. Instead, riparian land owners have the right to use and enjoy those waters in a reasonable manner. These water rights are inextricably bound to the legal ownership of real estate property that borders or underlies waterways or is located above groundwater. Consequently, those water rights cannot be legally separated from the ownership of the riparian lands and sold to other entities as is the policy in many western states which typically utilize the prior appropriation doctrine (*i.e.*, first in time, first in right) (Gaffney & Hays, 2000).

The Flick Family Irrevocable Trust will hold the water rights on each mitigation site. There is no plan for irrigation or mechanized distribution of water at any mitigation site. All water necessary for wetland and/or stream mitigation will be attained by stream flows, precipitation, overland sheet flow and overbank flood flows based on the Flick Family Irrevocable Trust's water rights. In addition, the plant species proposed for each mitigation site will be native species and therefore generally drought resistant.



The Flick Family Irrevocable Trust will also own all mineral rights on each mitigation site. Consequently, the potential for future mineral exploration or extraction will not threaten the long-term sustainability of each mitigation sites as the mitigation sites' conservation easements will prohibit mineral extraction. Additionally, any existing real estate encumbrances on each mitigation site will be disclosed to the Corps and IRT.

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**APPENDIX A**

**FINANCIAL ASSURANCES:  
LETTER OF CREDIT EXAMPLE**

EXAMPLE



December 4, 2013

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 EIGHTY THREE THOUSAND EIGHT HUNDRED FIFTY AND NO/100 DOLLARS (\$83,850.00), 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 Clear Fork Stream and Wetland Stream Mitigation Bank Instrument, and the amount of the drawing will be used to implement corrective measures for the mitigation bank. Under Letter of Credit No. 75201211-75010, we are providing this documentation instructing Country Club Bank to pay proceeds in the amount of \$83,850.00 (or a lesser amount determined by the United States Army Corps of Engineers to be sufficient to bring the mitigation bank 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 Clear Fork Stream and Wetland Stream 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 August 2014. However, this Letter of Credit is automatically renewed 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

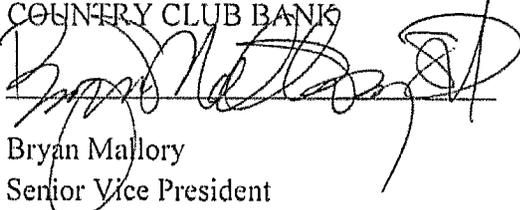
of Engineers, annually, that the value of the required Letter of Credit is in full force and effect for the annual renewal period. Swallow Tail, L.L.C. and/or Country Club Bank must notify the United States Army Corps of Engineers immediately upon the commencement of any bankruptcy proceedings. This 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 120-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  
Senior Vice President

**APPENDIX B**

**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 Permit No. \_\_\_\_\_ of the U.S. Army Corps of Engineers ("Corps") (hereinafter referred to as the "Permit") authorizes certain activities which affect waters of the United States; and

**WHEREAS**, the Permit requires that Grantor preserve, enhance, restore, or mitigate wetlands or uplands located on the Property; and

**WHEREAS**, Grantor, in consideration of the issuance of the Permit to construct and operate the permitted activity, and as an inducement to the issuance of the Permit, 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 Permit 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 Permit, 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/KANSAS and shall maintain the hydrology of the Property as it currently exists or as otherwise required by the Permit 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.

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 Permit 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 seized 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 C**

### **SPONSOR QUALIFICATIONS**

# SWALLOW TAIL, LLC

## Clear Fork Wetland & Stream Mitigation Bank Johnson County, Missouri

**Swallow Tail** operates the 212-acre Clear Fork Wetland & Stream Mitigation Bank which will serve as compensatory mitigation for impacts to wetlands and streams across most of the Missouri portion of the Kansas City metropolitan area as well as much of the west-central part of the state.

This former agricultural property includes over a mile of both sides of the Clear Fork of the Blackwater River and more than a mile and a third of tributary streams. Almost all of these streams were surrounded by row crop fields with only narrow riparian buffers and a stretch of Clear Fork more than 1,000 feet in length was entirely devoid of riparian vegetation along one side. The mitigation activities completed on the site have addressed the needs of the property and the watershed through the planting of 98 acres of new riparian buffers and the establishment of about 60 acres of herbaceous wetlands, 18 acres of forested wetlands and 5 acres of scrub-shrub wetlands. In addition, roughly 19 acres of existing riparian buffers were enhanced and about 10 acres of upland buffers were established or preserved.

These habitat improvements will provide important water quality and wildlife habitat benefits. In particular, agricultural runoff from approximately 570 acres of surrounding farmland is diverted into the roughly 60 acres of contiguous wetlands in the southern portion of the mitigation bank which allows for significant pollutant removal, flood abatement and wildlife habitat creation. Additionally, because this mitigation bank is situated along Clear Fork between Knob Noster State Park and the Ralph and Martha Perry Memorial Conservation Area, it will serve as a valuable stopover point for wildlife traveling between these two important protected areas.



# SWALLOW TAIL, LLC

## Osage Plains Wetland & Stream Mitigation Bank Cass County, Missouri



**Swallow Tail** is the Sponsor of the first approved private wetland and stream mitigation bank in western Missouri. The primary restoration activities on this roughly 40-acre property included the widening of the riparian corridor of the East Branch of the South Grand River to 300 feet on one side for more than a half mile and the restoration and enhancement of about 20 acres of wetlands in a diversity of habitats and landscape positions. These improvements to water quality and wildlife habitat are used for compensatory mitigation for impacts to waters of the United States in the Central Plains / Osage / South Grand Ecological Drainage Unit which encompasses the upper portion of the Osage River watershed in Missouri.

Swallow Tail recognized that the site, which had been in row crop production for decades, had a significant amount of local topographic variability and a favorable position in the landscape for wetland development. The enhancement of the site's intricate topography has led to a wide variety of microhabitats along a hydrologic gradient which allowed for the establishment of a high amount of botanical diversity because of Swallow Tail's extensive planting of a wide diversity of appropriate native plant species to match the unique topography, soil and hydrologic conditions of the site.

The site receives almost 400 acres of local runoff from adjacent agricultural properties via several small streams that flow across the property into the East Branch of the South Grand River. By detaining much of that runoff in the site's restored and enhanced floodplain wetlands, the Sponsor was able to decrease the amount of nutrients, sediment and agricultural pollution that flows into the East Branch of the South Grand River and downstream waters, including Truman Lake and Lake of the Ozarks. In addition, the East Branch of the South Grand River floods the site at least annually so the development of a significant amount of floodplain wetlands on the site also provides some level of water quality improvement of those flood waters. Moreover, the excavation of the eastern floodplain areas and the creation of floodplain pools in the western half of the site has significantly increased the flood storage capacity of the property.



Wildlife has responded very favorably to the restoration of the site's riparian, wetland and upland buffer habitats. A variety of frogs and salamanders now inhabit the site along with a diversity of waterfowl, wading birds, turtles and other species adapted to the shallow marsh habitat that is the site's dominant feature.

The Bank has completed its final year of formal monitoring having met all of its performance standards successfully.



## SWALLOW TAIL, LLC

### **Sni-A-Bar Creek Wetland & Stream Mitigation Bank Jackson County, Missouri**

Swallow Tail restored this roughly 70-acre mitigation bank adjacent to Sni-A-Bar Creek, which is a primary tributary of the Missouri River. This site previously consisted of two row crop fields and a moderately thin existing riparian corridor along the stream. Some of the attributes of this property that made it a good candidate for restoration included its position in the floodplain, the long length of perennial streams along the periphery of the site and the presence of poorly drained hydric soils. In addition, the observation of several small degraded wetlands existing in shallow depressions was a sign of the potential of this site to support a much greater amount of wetlands under the right conditions.

In order to improve water quality and wildlife habitat on the property, several activities were undertaken to restore the mitigation bank to its likely pre-settlement state. The riparian corridor of Sni-A-Bar Creek was widened to 300 feet on one side for more than a mile and the same was done to roughly 750 linear feet of an unnamed perennial tributary. Additionally, the connection between the stream and its floodplain was enhanced by creating multiple holes in two agricultural levees that regularly protected the farm fields from flooding. Roughly 27.5 acres of forested and herbaceous wetlands were established on the floodplain in order to provide water quality, wildlife habitat and flood abatement benefits.

The increase in quality and quantity of stream, riparian and wetland ecosystems is being used as compensatory mitigation for unavoidable impacts to waters of the United States throughout the Central Plains / Blackwater / Lamine Ecological Drainage Unit which includes the watersheds of the primary tributaries to the Missouri River from Kansas City to mid-Missouri.

Approved in 2009, this site is continuing to mature and progress through the appropriate stages of ecological succession that have been accelerated by Swallow Tail's planting of a diversity of early, mid- and late successional herbaceous and woody species throughout the site.



## SWALLOW TAIL, LLC

### Stranger Creek Wetland & Stream Mitigation Bank Leavenworth County, Kansas



**Swallow Tail** owns and operates the 65-acre Stranger Creek Wetland & Stream Mitigation Bank which has been approved as the first stream mitigation bank in Kansas and the first wetland mitigation bank outside of Johnson County.

This property contains one side of a half mile of Stranger Creek, the largest tributary to the Lower Kansas River. Although it is listed by the State of Kansas as a High-Priority Fishery Resource, Stranger Creek is heavily impacted by agriculture in the vicinity of this property. Before the initiation of restoration activities, this parcel was a row crop farm field with relatively thin riparian corridors along Stranger Creek and an intermittent tributary. The Stranger Creek stream bank was highly eroded along a portion of this property and two small intermittent streams that carry runoff from the adjacent agricultural properties across the site had been previously channelized into functionally impaired drainage ditches. As a result of these factors and the presence of similar conditions throughout its watershed, Stranger Creek is listed as being impaired biologically by excess nutrients and/or sediments downstream of this restoration site.



Swallow Tail recognized the restoration potential of this site and initiated several important ecological improvements. These included reducing stream bank erosion along Stranger Creek by constructing a 300-foot long longitudinal peaked stone toe bank stabilization project and planting willow cuttings along 1,800 feet of the Stranger Creek bank, widening the Stranger Creek riparian corridor to 300 feet, creating or restoring more than 18 acres of floodplain wetlands and restoring more than 3,000 linear feet of the channelized intermittent streams to natural stream channels in their likely historic alignment with 200-foot wide riparian corridors.

As a result of these restoration activities, this mitigation bank is reducing the amount of nutrients and sediment flowing to Stranger Creek across the property, is providing additional flood storage capacity and is acting as valuable habitat for wildlife. After only two full growing seasons, the site is supporting a variety of reptiles, amphibians, waterfowl and wading birds. The ecological restoration and enhancement of the wetland and stream habitats on this property are being used as compensation for impacts to those habitats in much of northeastern Kansas, including most of Johnson County.



## SWALLOW TAIL, LLC

### Camp Branch Wetland & Stream Mitigation Bank Cass County, Missouri

**Swallow Tail** owns and operates an 87-acre wetland and stream mitigation bank located along more than a mile of the Camp Branch of Big Creek south of the Kansas City metropolitan area. The mitigation activities on this property serve as compensation for impacts to wetlands and streams in the unglaciated portion of the Osage River watershed within Missouri which encompasses the very west-central part of the state.

Before the Sponsor's mitigation activities much of this property existed as a mixture of farm fields, stream corridors and bottomland woods. The landscape position of this site within the floodplain has resulted in the presence of hydric soils throughout almost all of the property and a large number of small wetlands continued to exist despite many years of agricultural activity. All of these qualities along with relatively thin riparian corridors made this site very suitable for wetland and stream restoration and enhancement.

Camp Branch is listed as potentially impaired by habitat degradation because of rural non-point source pollution, which means that there is some indication of impairment but there is not enough data to properly list the stream as officially impaired.



The upper Osage River watershed which includes Camp Branch has been largely converted to agricultural land uses and stream channelization, levee construction, impoundment and the clearing of riparian corridors have been common practices. These activities have resulted in stream incision, loss of floodplain connectivity, loss of stream and wetland habitats and excess sediment and nutrient levels in waterways.

In response to the needs of the watershed, this mitigation bank includes more than ten acres of floodplain wetlands and in excess of forty acres of newly planted riparian buffer. Existing riparian buffers have been enhanced and almost two miles of streams have been protected on both sides with another third of a mile protected on one side. These additional riparian buffers and wetlands will help to absorb and filter sediment and agricultural pollution from more than 350 acres of adjacent agricultural land that drains across the site and from flood flows from Camp Branch. Additionally, the restored habitats which were constructed in 2009 provide high quality habitat to a number of wildlife species.

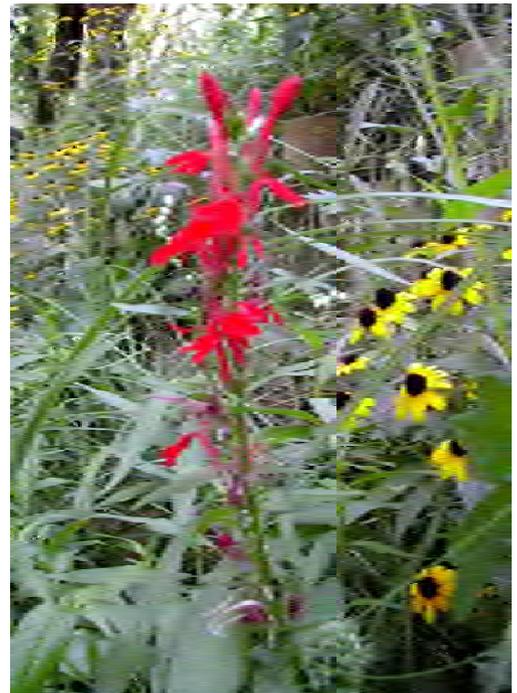
## INTRODUCTION

**Terra Technologies Inc.** is an innovative consulting firm with a focus on Clean Water Act Section 404 and 401 permitting and compensatory mitigation as well as biotechnical and environmental engineering. This focus requires an extensive amount of horticultural and biological expertise that also has application in a broad range of areas including large and small scale wetland and stream system development, wildlife habitat enhancement projects, ecologically-sensitive stream stabilization design and environmental remediation. The scientists and engineers at Terra Technologies provide a wide array of services including Clean Water Act 404/401/402 permit applications, compensatory mitigation design, rare and endangered species audits, environmental investigations, development of erosion and sediment control plans, and rain garden/natural stream channel design.

***Terra Technologies has successfully completed numerous biotechnical design projects across the Midwest. No less than 40 mitigation, constructed wetland, and stream bank stabilization projects are currently in construction or design in the greater St. Louis, Columbia, and Kansas City areas. Our scientists will also perform 100+ wetland delineations, covering approximately 15,000 development acres annually.***

Terra Technologies combines the skills and experience of licensed professional engineers with the fields of wetland ecology, horticulture, soil bioengineering, stream geomorphology, agrohistology, botany, wildlife biology and agronomy. This unique combination allows for the consideration and implementation of a broad range of solutions for Clean Water Act permitting, compensatory mitigation and storm water problems in both urban and rural areas. With a professional staff of experienced scientists and engineers, our clients have the advantage of diversified resources and the expertise of the entire firm.

Terra Technologies has been involved with numerous compensatory mitigation projects, including several large wetland and stream mitigation banks. Our design approach considers the existing site topography, hydrology, soils, and vegetation and then increases the amount of surface hydrology





through the manipulation of water inputs and the creation of extensive and varied microtopography. This microtopography creates a variety of hydrologic gradients within the onsite soils which leads to a diversity of microhabitats that support a wide diversity of plant life. All compensatory projects are seeded and planted with a large number of appropriate native herbaceous and woody species.

Our firm also has extensive expertise with stream stabilization and restoration projects. Terra Technologies can specify and implement a variety of materials and techniques including erosion control blankets, turf reinforcing matrices, wire reinforced turf reinforcing matrices, geocellular confinement, biogabions, preplanted coir fiber logs, landscaped open-face modular wall systems, articulated concrete block systems, pool and riffle systems, bonded fiber matrices, and others. Terra Technologies constantly looks at new applications for existing products that can be used for biotechnical solutions. When appropriate, pure vegetative stabilization approaches can also be effective. In all of our compensatory mitigation approaches Terra Technologies strives to provide long term solutions that work with, rather than against, natural environmental processes.

The key to any compensatory mitigation project is the long-term establishment of appropriate site hydrology as well as self-sustaining and low maintenance vegetation that is indigenous to the area. If the vegetation fails to establish, the long-term success of the project is in serious question. Pioneering vegetation often invades the initial establishment phase but is usually considered undesirable over the long term. Many of the initial plant materials mature and die within the first few growing seasons or dominate the environment such that more desirable plant materials cannot become established. A mature restoration project should contain





a balanced mix of desirable riparian vegetation and grasses that do not require extensive maintenance to preserve the balance and control undesirable vegetation. Therefore, a complete understanding of the succession of plant communities is necessary to assure the long-term success of the project. Terra Technologies brings the necessary knowledge of agrostology, horticulture, soil bioengineering, and botany to the project to assure long-term success.

***Terra Technologies is comprised of highly qualified professionals with extensive experience and a range of engineering and scientific disciplines. We are recognized by our clients for providing value-added environmental engineering alternatives while responding rapidly to clients' needs. In total, more than 600 mitigation projects have been completed since the Company was founded in 1992.***

