TERRA TECHNOLOGIES

Prospectus

For the

Crimson Ridge
Stream Mitigation Bank

March 2012

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APPENDICES

I. INTRODUCTION

A. *Location of Mitigation Bank*

The Sponsor, Habitat Kansas, LLC, owns approximately 14.51 acres of land, including the water rights, in the City of Shawnee in Johnson County, Kansas for which the Sponsor has developed a preliminary mitigation plan to restore, enhance, and maintain stream systems. The approximate center point of the bank site is at 39.047° North 94.848° West, which is generally located near the intersection of 47th Street and Anderson Street in Shawnee (Image 1). It is located in the southwest quarter of Section 34, Township 11S, Range 23E (Figure 1 Township Range Section). The north boundary is a railroad right-of-way and adjacent residential properties; the east and west boundaries are adjacent residential properties; and the west boundary is adjacent agricultural properties.

Image 1. Location of Crimson Ridge Stream Mitigation Bank

Image 2. Approximate Bank Boundaries

Driving directions to the site are as follows. From Interstate 70 East, take exit 224 for KS-7 toward US-73/Bonner Springs/Leavenworth. Travel approximately 0.6 miles, keep left at the fork, and follow the signs for Bonner Springs/Olathe. Turn left onto KS-7 South and travel approximately 4.2 miles south to 47th Street. Turn left onto 47th Street and travel approximately 0.4 miles east to Anderson Street. The bank site is located in the green space between the residential properties on both sides of Anderson Street.

B. *Establishment and Operation of Bank*

The mitigation bank will be established by approval of the Final Mitigation Banking Instrument which will serve as a binding agreement regarding the establishment, use, operation, and maintenance of the Crimson Ridge Stream Mitigation Bank (the Bank) and will be made and entered into, by, and among Habitat Kansas, LLC (Sponsor) and the members of the Interagency Review Team (IRT). The IRT will be chaired by the Kansas City District of the U.S. Army Corps of Engineers (Corps) and will also include as

members the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), and the Kansas Department of Wildlife, Parks and Tourism (KDWPT).

The Final Mitigation Banking Instrument will become valid on the date of the last signatory's signature. The Final Mitigation Banking Instrument may be amended or modified with the written approval of all signatory parties as described in 33 CFR Part 332.8(d). 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.

The Sponsor shall create the stream habitats shown on the Bank Development Plan in Appendix C or as shown in the subsequent As-Built Figure and shall operate the Bank in accordance with the provisions of the Final Mitigation Banking Instrument. The Sponsor shall receive stream credits upon satisfaction of the ecological performance standards outlined in the Final Mitigation Banking Instrument. The credit release schedule shall be tied to the achievement of performance-based milestones such as site grading, planting, and the establishment of specified plant and animal communities as described in the mitigation plan. The credit release schedule will be determined based on several factors such as, but not limited to, the method of compensatory mitigation (restoration, establishment, enhancement or preservation), the likelihood of success, the amount of work needed to generate the credits, and the aquatic resource types and function(s) to be provided by the project. Credits will be sold to third parties at an appropriate market rate to be determined by the Sponsor. In addition, the sale of stream credits available at the Bank 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. Additional mitigation requirements may be necessary to comply with other federal, state, and/or local statues and regulations.

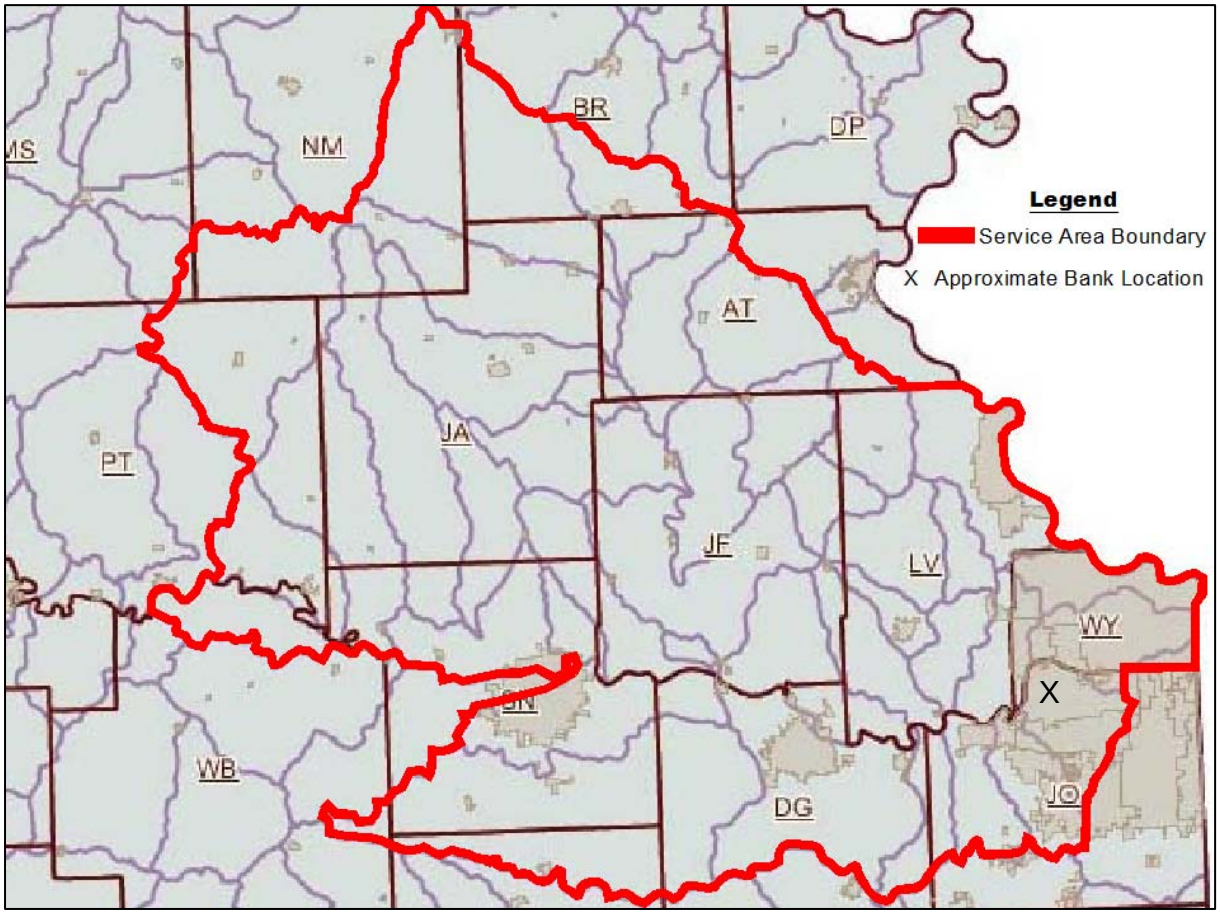
To the extent that specific language in this document changes, modifies, or deletes terms and conditions contained in those documents that are incorporated into the Mitigation Banking Instrument by reference, and that are not legally binding, the specific language within the Mitigation Banking Instrument shall be controlling. If any provision or provisions of this Mitigation Banking Instrument shall be held to be invalid, illegal, unenforceable or in conflict with the law of any jurisdiction, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby unless the deletion of such provision or provisions would result in such a material change so as to cause completion of the responsibilities described in this document to be unreasonable.

II. SERVICE AREA

The service area of the Bank is the 10270104 Lower Kansas 8-digit Hydrologic Unit Code (HUC) watershed in which the bank is located as well as the two adjacent 8-digit HUC watersheds (10270103 Delaware and 10270102 Middle Kansas) that are within the same 6-digit HUC watershed, excepting all of the following 11-digit HUCs: 10270102010,

10270102080, 10270102090, 10270102100, and 10270102120. The service area also includes the entire 10300101 HUC watershed within Wyandotte County and all of 10240011 HUC watershed within Wyandotte and Leavenworth County. The boundaries of this service are shown below in Image 2 along with the location of the Bank. On a case-by-case basis the Corps, in consultation with the IRT, may approve mitigation credits at the Bank to be sold to offset impacts from Department of the Army permit impacts that occur outside this Bank's service area. If determined appropriate, the Corps will determine the number of credits needed to be purchased at the Bank in order to adequately replace the aquatic resources lost at the Department of the Army permit site.

Image 2. Crimson Ridge Stream Mitigation Bank
Service Area Boundary & Bank Location



III. OBJECTIVES

The Sponsor will create the Crimson Ridge Stream Mitigation Bank which will be approximately 14.51 acres in area. The objectives for the Bank and for the watershed are to: restore existing aquatic resources, increase the amount of aquatic and upland habitat, and prevent future aquatic resource impairment. To achieve these goals, the Sponsor proposes to undertake the following activities:

- Restore 7.36 acres of Riparian Corridor
- Enhance 7.15 acres of Riparian Corridor
- Restore 5,458 linear feet of intermittent stream channel
- Restore 262 linear feet of ephemeral stream channel

The completed construction, restoration, enhancement, and management activities will function to meet the Bank's objectives. Removal of invasive species and planting of native herbaceous & woody species will restore impaired resources and result in a net increase the aquatic and upland habitat at the site. Installation of grade-control structures within the intermittent and ephemeral stream channels will prevent future stream instability and create pool-riffle habitat. Stream bank stabilization and riparian corridor restoration will prevent aquatic impairment from excess runoff and sedimentation. All of these activities are in accordance with the provisions of the Bank Development Plan located in Appendix C. The Sponsor shall then maintain the Bank in such condition in perpetuity.

The aquatic benefits provided by the planned restoration activities will compensate for the loss of such habitats within the geographic service area of the Bank. The creation of the Bank will improve water quality by filtering surface and subsurface water that drains across the property and by storing and treating water that floods the site when the tributaries overflow their banks and flood portions of the property. All these benefits (riparian corridor restoration, riparian corridor enhancement, and stream channel restoration) are practices that are needed in the Kansas River watershed to prevent erosion, capture sediment from upstream sources, address water quality problems and improve stream bank stability.

IV. NEED & FEASIBILITY

Numerous historic and current threats to aquatic resources within the watershed necessitate the proposed aquatic resource improvements. Threats to aquatic resources include, but are not limited to excessive nutrient loading, stream bank erosion, land clearing, increased runoff due to urbanization, invasive species, increased sediment loading, reduction of historical water levels, water pollution, and inadequate riparian corridors. Within the Kansas River watershed the two major reservoirs, Perry Lake and Clinton Lake, have impounded nearly one hundred miles of the Wakarusa River, Delaware River, and their tributaries. Impoundment of these streams has eliminated pool and riffle complexes which are vital special aquatic sites for lotic organisms. Other causes of historic habitat loss within the Bank's watershed include agricultural conversion, urbanization, and sedimentation caused by detrimental land use practices. Before settlement by people of European ancestry, the most prominent habitat feature within the watershed was prairie. Historical surveys from the 1850s indicate that 85% of Johnson County, 94% of Douglas County, and 75% of Wyandotte County land cover was native prairie. However, today less than one half of one percent of the high quality prairie in these counties remains (Kindscher *et. al*, 2005). Most of the native prairie loss resulted from conversion to agriculture and urbanization. Continued agricultural activities and

rapid urbanization are the dominant current land use trends within the watershed which contains the urban areas of Johnson County, Topeka, Lawrence, and Kansas City, Kansas, which are four of the largest urban areas in the state. Wyandotte and Johnson County in the Kansas City metropolitan area are the two most heavily urbanized areas in the watershed. The population of Johnson County has grown by nearly 400% over the last 50 years and Wyandotte County, whose population has actually decreased during that time period, is nearly completely urbanized (KWO, 2009). Prior to passing of the Clean Water Act and Federal Emergency Management Agency regulations regarding development within the floodplain, wetlands and streams within the watershed were impacted without regulation and the amount of wetlands, streams and wildlife habitat were significantly reduced.

The restoration and enhancement activities previously stated are technically feasible. With an intensive herbicide application program and minimal seeding and labor the Bank site can be planted with native trees and herbaceous plants to create a diverse riparian habitat that will improve water quality and wildlife habitat. The Bank site is ecologically suitable for stream and riparian corridor restoration. It contains long stretches of intermittent and ephemeral streams that have denuded riparian corridors and require in-stream restoration to re-establish proper hydrologic functioning and wildlife habitat. As a result, the parcel has great potential for restoring riparian corridors along these stream systems and the aquatic habitat value of the site through the reduction of nutrients and sediment travelling to downstream waters and improved aquatic habitat value of the site.

V. OWNERSHIP & LONG-TERM MANAGEMENT

Habitat Kansas, LLC owns approximately 14.51 acres of land, including the water rights, in Shawnee, Johnson County, Kansas for which the Sponsor has developed a preliminary mitigation plan to restore, enhance, and maintain streams and riparian corridors. To ensure that the Bank remains in its desired state in perpetuity, the entire area will be protected by means of conservation easement which will preserve the Bank lands as undeveloped wildlife habitat. A draft conservation easement is included in Appendix D. 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 Bank is approved, copies of the finalized and recorded conservation easement shall be provided to the Corps.

There are no short-term or long-term plans to transfer title of the property to another party. It is the intention of the Sponsor to maintain the property in perpetuity as highly functioning habitat in accordance with the terms of the long-term management plan and the conservation easement. The conservation easement shall restrict any development of the site in perpetuity and shall stay with the property in the instance that the title to the property is transferred to another party.

Routine maintenance of the Bank property will continue for a minimum of fifteen years after approval of the final mitigation banking instrument or until all credits have been sold, whichever is later, at which point the ecosystems on the property will be self-sustaining and self-regulating.

VI. SPONSOR QUALIFICATIONS

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) under contract to the Sponsor. 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 Missouri and Kansas 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 three approved and nine proposed wetland and stream mitigation banks totaling over 1,000 acres. Project examples and additional information regarding Terra Technologies' qualifications are included in Appendix E.

VII. ECOLOGICAL SUITABILITY

The Bank site contains long stretches of three intermittent stream channels and two small ephemeral tributaries. The stream channels are significantly impaired due increased runoff within the local watershed caused by increased land development. All of the intermittent channels display significant levels of accelerated bed and bank erosion. While the stream channels and associated pre-development riparian corridors constitute virtually all of the Bank area, approximately 20% of the pre-development riparian corridor within the Bank has been completely cleared and replaced with turf grasses. The riparian corridor along the streams is in moderate condition with significant populations of invasive and undesirable vegetation. Additionally, significant portions of the riparian corridor along the stream channels has been cleared and replaced with turf grasses. Dominant species within the riparian corridors of intermittent and ephemeral streams include: honey locust (*Gleditsia triacanthos*), Johnsongrass (*Sorghum halepense*), poison ivy (*Toxicodendron radicans*), corral berry (*Symphoricarpos orbiculatis*), black walnut (*Juglans nigra*), Missouri gooseberry (*Ribes missouriense*), hackberry (*Celtis occidentalis*), Canada goldenrod (*Solidago canadensis*), tall fescue (*Festuca arundinacea*), bitter-nut hickory (*Carya cordiformis*), smooth brome (*Bromus inermis*), red cedar (*Juniperus virginiana*), Virginia wild rye (*Elymus virginicus*), common vetch (*Vicia sativa*), cottonwood (*Populus deltoides*), slippery elm (*Ulmus rubra*), and raccoon grape (*Ampelopsis cordata*). As a result of these impairments, the Bank site is ecologically suitable for stream and riparian corridor restoration. Moreover, it can adequately support the planned restoration activities which will greatly increase the aquatic habitat value of the site.

TERRA TECHNOLOGIES

The site is mapped by the FWS' National Wetlands Inventory (NWI) and no wetlands or ponds are indicated within the limits of the property (Figure 2). The topographical map published by the United States Geological Survey indicates the presence of three blue-line tributaries (Figure 3).

In May and June 2008, a scientist with Terra Technologies visited the site for the collection and evaluation of scientific data necessary to determine the extent, magnitude, and spatial limits of jurisdictional environs. Figure 4 shows the results of the Jurisdictional Assessment of the Site. It is the opinion of Terra Technologies that the Site contains one palustrine emergent wetland encompassing 0.06 acre, three intermittent streams totaling 5,513 linear feet, and two ephemeral streams totaling 687 linear feet. Intermittent # 1 and Intermittent # 2 flow south to north along the along the east and west boundaries of the parcel respectively. Intermittent # 1 and Intermittent # 2 make confluence within the northernmost portion of the parcel to form Intermittent # 3. Intermittent # 3 flows from the south to the north and exits the site at the northern boundary. Intermittent # 3 flows directly into the Kansas River approximately 1 mile downstream of the property boundary. Ephemeral # 1 flows from west to east in the southwestern corner of the site and has a direct confluence with Intermittent # 2. Ephemeral # 2 flows from the southwest to the northeast in the northwestern corner of the site. It exits the parcel underneath a railroad berm at the northern boundary and drains into an off-site tributary of Intermittent # 3. Wetland 1 is located within an oxbow along Intermittent # 2. It maintains hydrologic connectivity to downstream waters as it directly abuts Intermittent # 2. The Corps has not issued an Approved or Preliminary Jurisdictional Determination for the Site.

According to the National Cooperative Soil Survey's Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/) administered by the Natural Resources Conservation Service (NRCS), soils on the site are mapped as Kennebec silt loam, frequently flooded (7051); Eudora-Bismarckgrove silt loams, rarely flooded (7106); Eudora silt loam, rarely flooded (7123); Ladoga silt loam, 3 to 8 percent slopes (7285); Ladoga silt loam, 8 to 15 percent slopes (7286); Vinland-Rock outcrop complex, 15 to 45 percent slopes (7658). Kennebec silt loam is listed as hydric for Johnson County, Kansas. The hydric soil map of the site is shown as Figure 5.

VIII. REFERENCES

Kansas Water Office. January 2009. April 10, 2010. Kansas Water Plan. Kansas-Lower Republican River Basin. <http://www.kwo.org/Kansas%20Water%20Plan/SWP/KWP_2008/Vol_III_Docs/KLR/Rpt_KLR_Entire_Basin_Section_KWP_2009.pdf >.

Kindscher, K. W. H. Busby, J. M. Delisle, J. A. Dropkin, and C. C. Freeman. 2005. A Natural Areas Inventory of Douglas, Johnson, Johnson, Miami, and Wyandotte Counties in Northeast Kansas. Open-File Report No. 124. Kansas Biological Survey., Lawrence, KS. 74 pp.

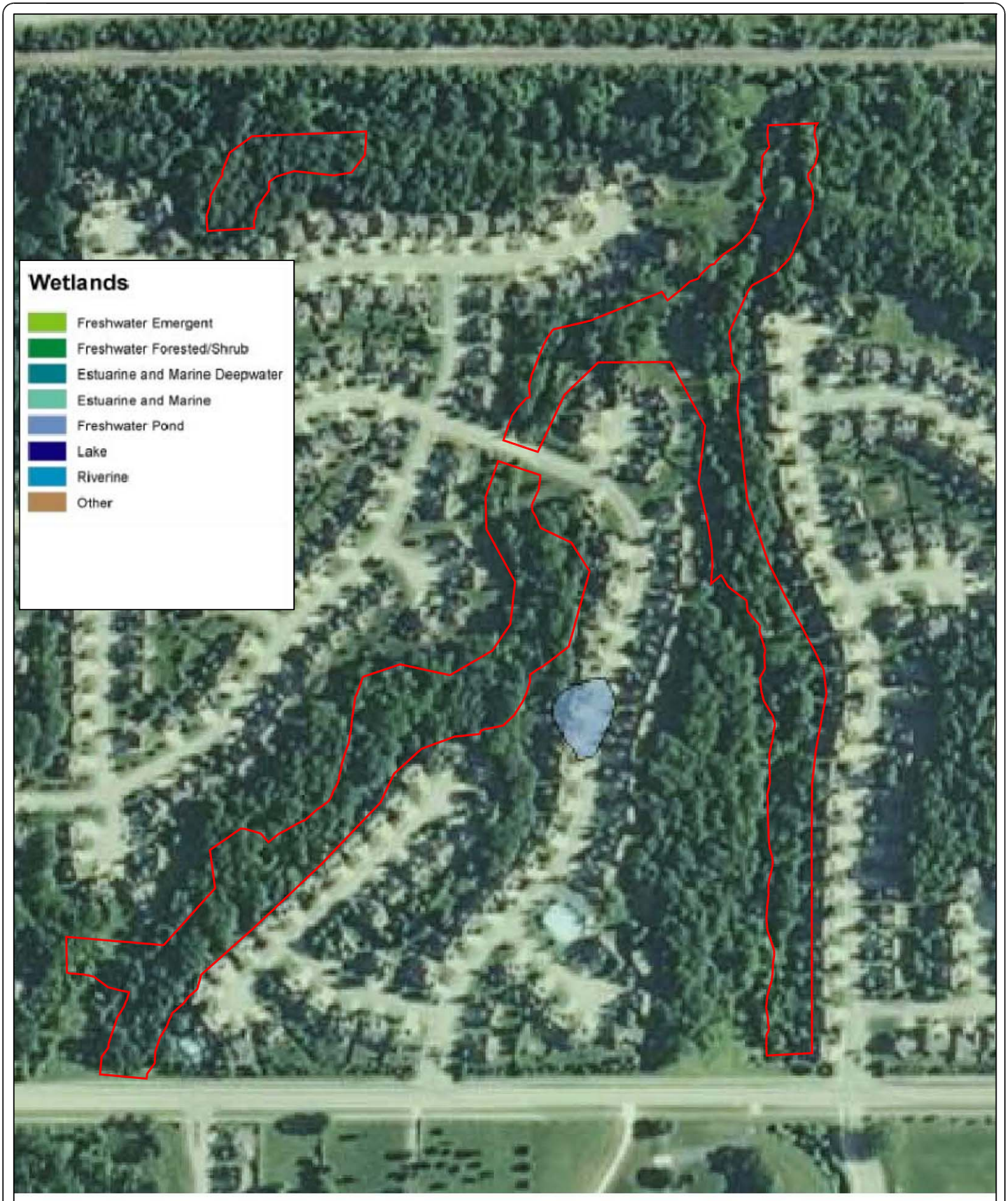
APPENDIX A

FIGURES

JOB NO.	1
SHEET NO.	1
DRAWN BY	DMG
CHECKED BY	
DATE	03/20/12
SHEET TITLE	TOWNSHIP, RANGE, SECTION
PROJECT	CRIMSON RIDGE STREAM MITIGATION BANK
CLIENT	HABITAT–KANSAS LLC
REVISIONS DATE	
REVISIONS DESCRIPTION	

FIGURE 1

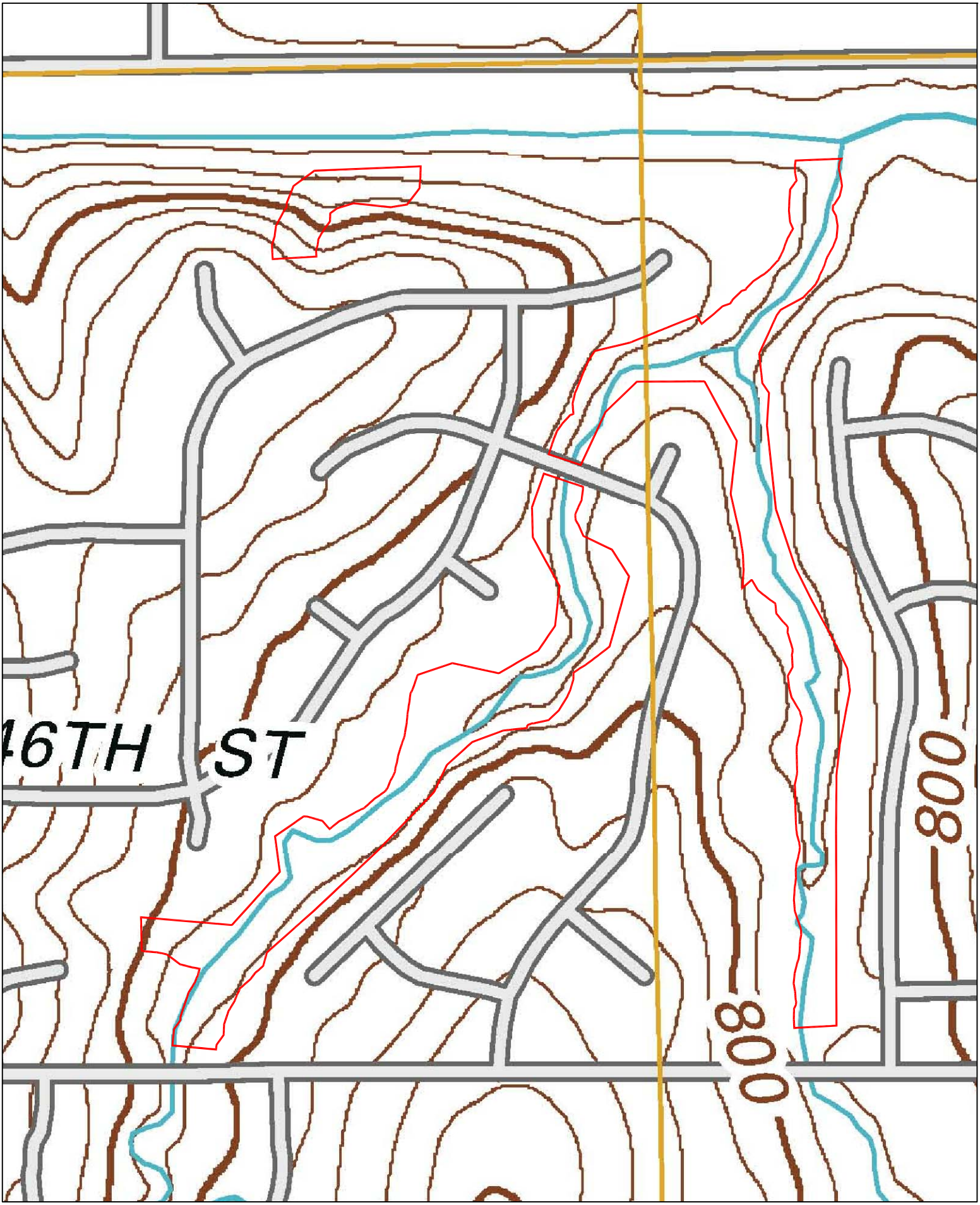
Terra Technologies
1920 W. 143rd St., Ste. 140
Leawood, Kansas
66224
Tel 913.385.9560 Fax 913.385.5295



JOB NO.	1
SHEET NO.	1
DRAWN BY	CAS
CHECKED BY	
DATE	03/20/12
DATE	
REVISIONS DESCRIPTION	
SHEET TITLE	NATIONAL WETLANDS INVENTORY
PROJECT	CRIMSON RIDGE STREAM MITIGATION BANK
CLIENT	HABITAT–KANSAS LLC

FIGURE 2

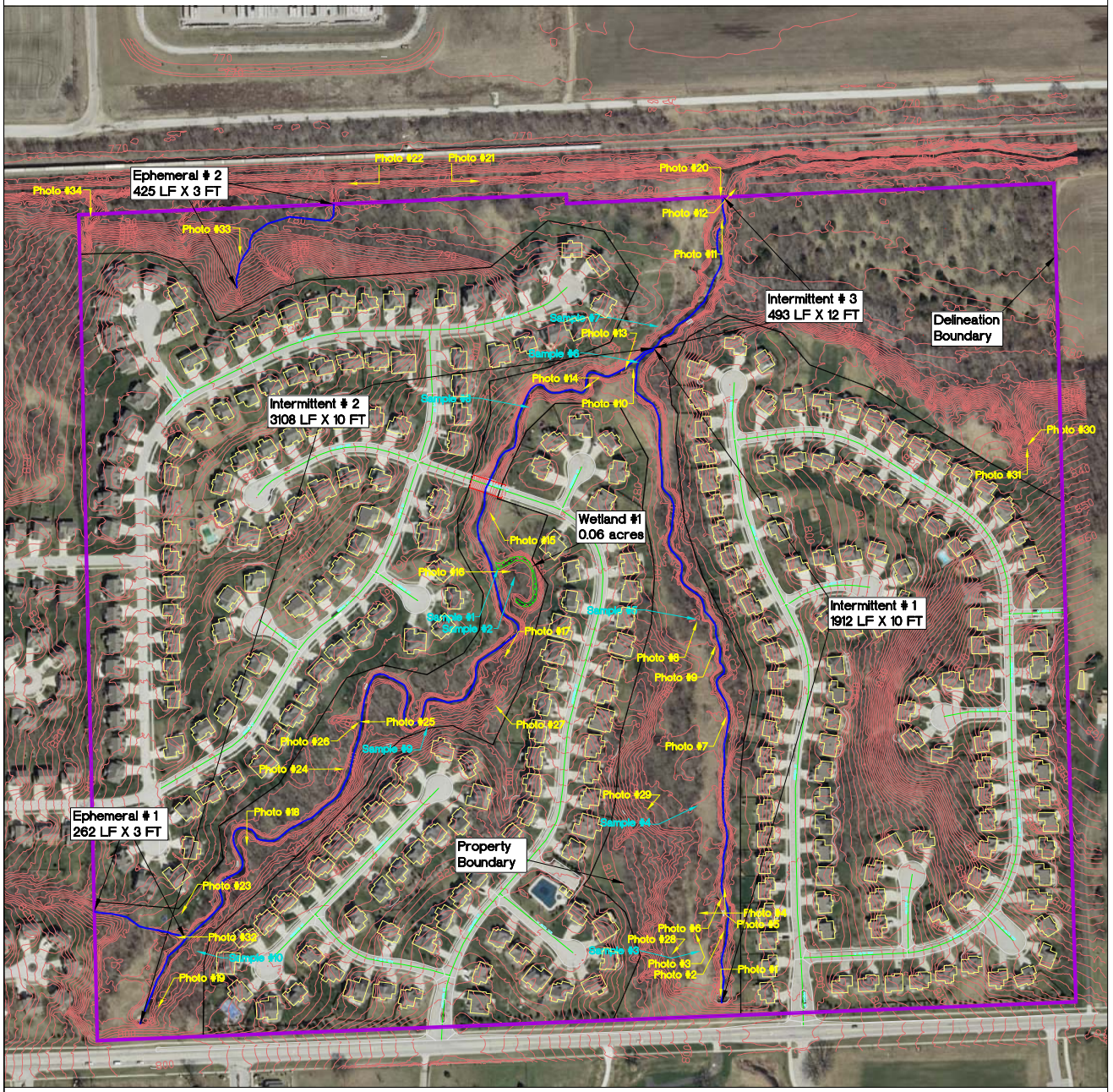
Terra Technologies
1920 W. 143rd St., Ste. 140
Leawood, Kansas
66224
Tel 913.385.9560 Fax 913.385.5295



JOB NO.	1
SHEET NO.	1
DRAWN BY	CMG
CHECKED BY	
DATE	03/20/12
SHEET TITLE	USGS
PROJECT	CRIMSON RIDGE STREAM MITIGATION BANK
CLIENT	HABITAT–KANSAS LLC

FIGURE 3

Terra Technologies
1920 W. 143rd St., Ste. 140
Leawood, Kansas
66224
Tel 913.385.9560 Fax 913.385.5295



JURISDICTIONAL ASSESSMENT

Wetland 1: 0.06 acres

TOTAL WETLAND AREA: 0.06 ACRES

Ephemeral 1: 262 LF, OHWM: 3 FT
Ephemeral 2: 425 LF, OHWM: 3 FT

TOTAL EPHEMERAL LENGTH: 687 LF

Intermittent 1: 1912 LF, OHWM: 10 FT
Intermittent 2: 3108 LF, OHWM: 10 FT
Intermittent 3: 493 LF, OHWM: 12 FT

TOTAL INTERMITTENT LENGTH: 5513 LF

Site Location
T11S-R23E-S34
Shawnee, Johnson County, Kansas
132 Acres

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

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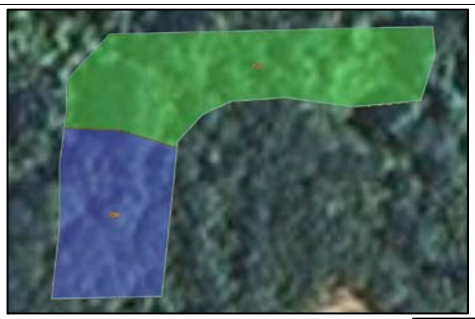
FIGURE 4

SHEET TITLE: JURISDICTIONAL ASSESSMENT
PROJECT: CRIMSON RIDGE STREAM MITIGATION BANK
CLIENT: HABITAT-KANSAS LLC

REVISIONS	
DATE	DESCRIPTION
7/8/08	Corrections per DLF

DATE 07/01/08
CHECKED BY CAG DRAWN BY JMG
SHEET NO. JA
JOB NO. XXX

Hydric Rating by Map Unit— Summary by Map Unit — Johnson County, Kansas (KS091)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7051	Kennebec silt loam, frequently flooded	Partially Hydric	13.5	81.7%
7106	Eudora-Bismarckgrove silt loams, rarely flooded	Not Hydric	0.2	1.4%
7123	Eudora silt loam, rarely flooded	Partially Hydric	1.0	6.2%
7285	Ladoga silt loam, 3 to 8 percent slopes	Not Hydric	1.6	9.9%
7658	Vinland-Rock outcrop complex, 15 to 45 percent slopes	Not Hydric	0.1	0.8%
Totals for Area of Interest			16.5	100.0%



Hydric Rating by Map Unit— Summary by Map Unit — Johnson County, Kansas (KS091)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7123	Eudora silt loam, rarely flooded	Partially Hydric	0.5	61.6%
7286	Ladoga silt loam, 8 to 15 percent slopes	Not Hydric	0.3	38.4%
Totals for Area of Interest			0.9	100.0%

JOB NO. 1 | SHEET NO. 1 | DRAWN BY CAG | CHECKED BY | DATE 03/20/12

SHEET TITLE: HYDRIC SOILS

PROJECT: CRIMSON RIDGE STREAM MITIGATION BANK

CLIENT: HABITAT–KANSAS LLC

DATE | REVISIONS | DESCRIPTION

FIGURE 5

Terra Technologies
1920 W. 143rd St., Ste. 140
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APPENDIX B

PHOTOGRAPHIC DOCUMENTATION

Terra Technologies
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SHEET TITLE: PHOTO POINTS
PROJECT: CRIMSON RIDGE STREAM MITIGATION BANK
CLIENT: HABITAT-KANSAS LLC

REVISIONS	
DATE	DESCRIPTION
7/8/08	Corrections per DLF

DATE 07/01/08
CHECKED BY CAG
DRAWN BY JMG
SHEET NO. JA
JOB NO. XXX

PHOTO LOG

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 1 entering the property. OHWM of Intermittent # 1 averages 10 feet. View faces South. PHOTO #: 1	

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of eastern bank along Intermittent # 1 showing bank erosion and reduced riparian corridor. View faces Northeast. PHOTO #: 2	

PHOTO LOG

DATE: 06/19/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional swale View faces Northwest. PHOTO #: 3	

DATE: 06/19/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional swale further downslope. View faces West. PHOTO #: 4	

PHOTO LOG

DATE: 06/19/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of the confluence of erosional swale with Intermittent # 1. View faces North. PHOTO #: 5	

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of eastern bank along Intermittent # 1 showing bank erosion and failing rip- rap stabilization effort. View faces Northeast. PHOTO #: 6	

PHOTO LOG

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 1 further downstream. View faces Northeast. PHOTO #: 7	

DATE: 06/19/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of riparian condition along Intermittent # 1. View faces Northeast. PHOTO #: 8	

PHOTO LOG

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 1 further downstream with pooling. Considerable debris within the channel and bank erosion present. View faces Northeast. PHOTO #: 9	

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of the confluence of Intermittent # 1 and Intermittent # 2, and the beginning of Intermittent # 3. OHWM of I-3 averages 12 feet. View faces North. PHOTO #: 10	

PHOTO LOG

DATE: 06/19/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of downstream conditions of Intermittent # 3 with eroding banks. View faces North. PHOTO #: 11	

DATE: 06/19/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 3 at the parcel boundary. View faces Northeast. PHOTO #: 12	

PHOTO LOG

DATE: 06/19/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 2 upstream of the confluence with Intermittent # 1. OHWM of I-2 averages 10 feet. View faces Southwest. PHOTO #: 13	

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 2 further upstream. View faces Southwest. PHOTO #: 14	

PHOTO LOG

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 2 at 44th Terrace Bridge. View faces Northwest. PHOTO #: 15	

DATE: 06/19/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Wetland # 1 within high-flow swale along Intermittent # 2. View faces East. PHOTO #: 16	

PHOTO LOG

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 2 further upstream. view faces Southwest. PHOTO #: 17	

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 2 further upstream. View faces South. PHOTO #: 18	

PHOTO LOG

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Intermittent # 2 emerging onto parcel underneath 47th Street. View faces Southwest. PHOTO #: 19	

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of the confluence of Intermittent # 4 with Intermittent # 3. OHWM of Intermittent # 3 averages 4 feet. View faces South. PHOTO #: 20	

PHOTO LOG

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of off-site Intermittent stream. View faces East. PHOTO #: 21	

DATE: 05/13/2008 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of off-site Intermittent stream. View faces West. PHOTO #: 22	

PHOTO LOG

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of depressional area in the southeast corner of the parcel. Depression is erosional area within upland. View faces Southwest. PHOTO #: 23	

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional drainage lacking an OHWM meeting Intermittent # 2. View faces East. PHOTO #: 24	

PHOTO LOG

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional drainage originating from stormwater outfall. View faces West. PHOTO #: 25	

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional drainage from previous photo meeting Intermittent # 2. Water within drainage is backwater from Intermittent # 2. View faces Northeast. PHOTO #: 26	

PHOTO LOG

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional drainage originating from stormwater outfall. Swale has been piped. View faces Northwest. PHOTO #: 27	

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional gully. View faces Southwest. PHOTO #: 28	

PHOTO LOG

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional gully. View faces Southwest.	
PHOTO #: 29	

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional gully originating from strormwater outflow. View faces Southwest.	
PHOTO #: 30	

PHOTO LOG

DATE: 01/06/2011 TAKEN BY: CG	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of erosional gully downslope of the previous photo. View faces North. PHOTO #: 31	

DATE: 01/26/2011 TAKEN BY: DF	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Ephemeral #1. OHWM of E-1 averages X feet. View faces West. PHOTO #: 32	

PHOTO LOG

DATE: 01/26/2011 TAKEN BY: DF	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Ephemeral #2. OHWM of E-2 averages X feet. View faces South.	
PHOTO #: 33	

DATE: 01/26/2011 TAKEN BY: DF	SITE NAME: CRIMSON RIDGE MITIGATION BANK
COMMENTS: Photo of Erosional Feature. View faces South.	
PHOTO #: 34	

APPENDIX C

BANK DEVELOPMENT PLAN

Ephemeral # 2
425 LF X 3 FT

Remove
Abandoned
Sewer Pipe

Intermittent # 3
Restoration 493 LF

Bank Boundary

Intermittent # 3
493 LF X 12 FT

Intermittent # 2
Restoration 686 LF

Intermittent # 2
3108 LF X 10 FT

Regrade
Bank

Wetland #1
0.06 acres

Regrade
Bank

Intermittent # 2
Restoration 2367 LF

Intermittent # 1
1912 LF X 10 FT

Intermittent # 1
Restoration 1912 LF

Remove
Abandoned
Sewer Pipe

Regrade
Bank

Regrade
Bank

Ephemeral # 1
262 LF X 3 FT

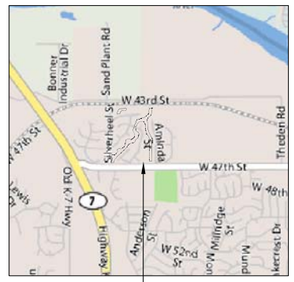
Ephemeral # 1
Restoration
262 LF

Riparian Restoration
7.36 acres

Riparian Enhancement
7.15 acres

Proposed In-Stream Improvements

- Grade Control Structure
- Rock Blanket and Bank Grading
- Remove Abandoned Sewer Main



Site Location
T11S-R23E-S34
Shawnee, Johnson County, Kansas
14.51 acres

GRAPHIC SCALE

125 0 62.5 125 250 500

(IN FEET)
1 inch = 125 ft.

Terra Technologies
1920 W. 143rd St., Ste. 140
Leawood, Kansas
66224
Tel 913.385.9560 Fax 913.385.5295

SHEET TITLE: BANK DEVELOPMENT PLAN (RESTORATION DESIGN)
PROJECT: CRIMSON RIDGE STREAM MITIGATION BANK
CLIENT: HABITAT-KANSAS LLC

REVISIONS

DATE	DESCRIPTION

DATE 03/13/12
CHECKED BY DLF DRAWN BY CAG
SHEET NO. 1
JOB NO. XXX

APPENDIX D

SITE PROTECTION INSTRUMENT

CONSERVATION EASEMENT

THIS DEED OF CONSERVATION EASEMENT is given this _____ day of _____, 20__, by Habitat-Kansas LLC, a Kansas Limited Liability Company, their successors and assigns, having an address of 24820 Miller Road Harrisonville, Missouri 64701 ("Grantor") to Midwest Mitigation Oversight Association, Inc., a Missouri non-profit corporation, its successors and assigns, having an address of 21301 Shelby Lane Belton, MO 64012 ("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 situate in Johnson County, KANSAS, more particularly described in Exhibit A, attached hereto and incorporated herein ("Property"), and

WHEREAS, Department Permit No. _____3 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 permits require that Grantor preserve, enhance, restore, or mitigate wetlands or uplands located on the Property and under the jurisdiction of the Corps; and

WHEREAS, Grantor, in consideration of the issuance of the permits to construct and operate the permitted activity, and as an inducement to Grantee and the Corps to issue the Permits, 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, agricultural, 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, or created pursuant to the Permit shall be retained and maintained in the restored, enhanced, or created condition required by the Permit.

2. **Rights of Grantee:** The following rights are conveyed to Grantee and 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, maintenance, and monitoring activities, or surface water management improvements, which are permitted or required by the Permit, the following activities are prohibited on the Property:

a. Construction or placing of buildings, roads, signs, billboards or other advertising, utilities, or other structures on or above the ground, or the construction or placing of structures below the ground that may impact the surface of the Property;

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 as may be permitted by the Permit, and except for the removal of nuisance, exotic, or non-native vegetation in accordance with a maintenance plan approved by Grantee;

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

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, except as may be permitted or required by the Permit;

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, or as otherwise may be permitted or required by the Permit;

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, except as permitted or required by the Permit;

h. The extraction of water from the Property or adjacent properties owned by Grantor, or the impoundment of water on the Property or on adjacent properties owned by Grantor, 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 any Corps rule, criteria, permit, or 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 KANSAS and shall maintain the hydrology of the Property as it currently exists or as otherwise required by the Permit.

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 or the Corps liable for any damage or injury that may occur on the Property.

10. **Recording Requirements:** Grantor shall record this Conservation Easement in the official records of Johnson County, KANSAS, 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 or any other party violating or attempting to violate these Restrictions. Venue for any such action shall be in Johnson County, KANSAS. 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 Permits.

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 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 Johnson County, KANSAS. 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 Johnson County, KANSAS, 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 KANSAS.

TO HAVE AND TO HOLD unto Grantee forever. 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.

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.

IN WITNESS WHEREOF, the Grantor has executed this Conservation Easement this _____ day of _____, 20___.

Signed in the presence of:

GRANTOR:

_____
Print Witness Name: _____

Habitat-Kansas, LLC
By: _____
Print: David L. Flick
Title: _____

The foregoing Conservation Easement was acknowledged before me this _____day of _____, 20___, by _____ as _____ of _____ who is personally known to me or has produced _____ _____ as identification.

My Commission Expires:

_____
NOTARY PUBLIC

IN WITNESS WHEREOF, the Grantee accepts this Conservation Easement this _____ day of _____, 20___.

Signed in the presence of:

GRANTEE:

_____
Print Witness Name: _____

Midwest Mitigation Oversight Association Inc.
By: _____
Print: James D. Drake
Title: _____

STATE OF MISSOURI/KANSAS
COUNTY OF _____

The foregoing Conservation Easement was acknowledged before me this _____day of _____, 20___, by _____ as _____ of _____ who is personally known to me or has produced _____ _____ as identification.

My Commission Expires:

_____
NOTARY PUBLIC

Exhibit “A”

The Property is defined as part of the SW ¼ of Section 34, Township 11S, Range 23E.

NOTE: Legal description and exhibit to be included prior to recordation of the property.

APPENDIX E

QUALIFICATIONS OF SPONSOR'S TECHNICAL CONSULTANT

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 agrohistology, 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.

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

Terra Technologies has designed and constructed a 70-acre Wetland and Stream Mitigation Bank near Grain Valley, Missouri.

The first wetland or stream mitigation bank on the Missouri side of the Kansas City metro area, this project transformed floodplain agricultural land that has been planted with row crops for several decades into a functioning wetland mitigation site and riparian buffer. The creation of wetlands and riparian corridors on this site will be used to compensate for impacts to wetlands and streams by projects in the bank's service area, which includes virtually all of Jackson, Ray, Lafayette, Saline and Pettis counties as well as parts of Clay, Cass, Johnson, Benton, Morgan, Moniteau, Cooper, Chariton, Carroll, Clinton and Caldwell counties.

The design of the site took advantage of its location adjacent to a perennial stream for the restoration of a wide riparian buffer. Areas further from the stream have soils that are more conducive for wetland development. Large amounts of microtopography throughout the poorly drained soils captures sufficient surface water to develop wetland conditions. Additionally, site excavation has enhanced the hydrology of the site by bringing the soil surface closer to the shallow ground water table.

Most of the site has been planted as a forested wetland, which is appropriate based on the landscape position of the site within the floodplain of a large stream. Within the forested areas, large spaces have been excavated to a greater depth to create shallow marsh areas, which will provide an additional amount of habitat diversity and will enhance habitat for migrating waterfowl, which already use a shallow swale on the site as resting ground.

Terra Technologies oversaw construction of this mitigation bank, is monitoring the site, and is selling the resulting wetland and stream credits to third parties. Construction of the site was completed in 2008.

Osage Plains Wetland & Stream Mitigation Bank
Cass County, Missouri

Terra Technologies designed and constructed a 40.5-acre Wetland and Stream Mitigation Bank located south of Kansas City in Cass County, Missouri. Credits generated by the restoration of wetlands and riparian corridors on the site will be sold to third parties to compensate for impacts to those resources caused by development and public works projects. The bank service area includes virtually all of Cass, Henry, and Bates counties as well as parts of Jackson, Johnson, Benton, St. Clair, Cedar, Barton, and Vernon counties.

Terra Technologies 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. This topographic variability was enhanced to facilitate the creation of wetland hydrology and hydric soil development.

The enhancement of the site's intricate topography led to the creation of a wide variety of microhabitats along a hydrologic gradient, which allowed for the establishment of a high amount of botanical diversity. Terra Technologies has planted appropriate native plant species to match the unique topography, soil, and hydrologic conditions of the site. The forested areas support more than 30 woody species including pin oak, shellbark hickory, and swamp white oak, the scrub-shrub communities include no less than 12 woody species including buttonbush, silky dogwood, shrub indigo, and elderberry, and the herbaceous communities included no less than 50 species including a diverse sedge mix, bulrushes, and numerous attractive wildflowers such as iris and bur marigold.

This project has provided numerous water quality benefits including, but not limited to: flood control, reconnection of a perennial river with its floodplain, and the removal of agricultural pollutants from runoff. In addition, numerous wildlife benefits have been established including amphibian breeding sites, a water source for birds & mammals, a wildlife corridor along the river with no fences, and establishment of small mammal habitat.

ACTIONS

- Intercept & disperse existing hydrology
- Removed 6-12" of topsoil in some areas to lower elevations
- Graded to desired contours
- Created significant microtopography
- Installed surge pipe to capture flow from East Branch of South Grand River
- Planted and hydroseeded

RESULTS

- Restored: 18.43 acres of wetlands
  Forested wetland (6.06 acres)
  Scrub - Shrub wetland (6.84 acres)
  Herbaceous wetland (5.53 acres)
- Enhanced Existing Floodplain Forest (2.12 acres)
- Restored Prairie (0.82 acres)
- Enhanced Existing Forested & Herbaceous Wetlands (1.14 acres)
- Reforested 17.98 acres along more than 3,000 feet of stream bank along one side (stream credits)

Stranger Creek Wetland & Stream Mitigation Bank
Leavenworth County, Kansas

Terra Technologies has established the first approved Wetland and Stream Mitigation Bank in Kansas with a service area that reaches outside of Johnson County. Our restoration plan for this 65-acre restoration site includes the creation of 42 acres of riparian corridor as well as the restoration and enhancement of 18 acres of wetlands which will improve water quality by filtering agricultural runoff that flows onto the site from neighboring properties.

Streams that were transformed into linear agricultural drainageways have been restored to natural stream channels with appropriate sinuosity and entrenchment ratios. These streams now flow into a series of wetlands and eventually into a larger wetland pool in the southern portion of the property. Additionally, the current erosion of the stream bank adjacent to Stranger Creek has been addressed through the construction of a longitudinal peaked stone toe bank stabilization.

Terra Technologies' commitment to botanical diversity resulted in the seeding and planting of more than 100 tree, shrub, and herbaceous species on this site. The creation of berms and microtopography will result in a variety of microhabitats which will allow for the establishment of a wide diversity of plant species. The abundance of different plant species and water levels will produce a significant benefit to wildlife habitat.

In addition to designing, permitting, and overseeing the construction of the mitigation bank, Terra Technologies has begun monitoring and will sell the resulting wetland and stream credits. Construction began in early 2010 and the mitigation bank was approved in 2011.