

MITIGATION BANKING INSTRUMENT
GIN CITY MITIGATION BANK
HARRIS COUNTY, TEXAS
SWG-2011-01181

Sponsor:

Gin City Restoration, LLC
12417 FM 1960
Huffman, Texas 77336

Prepared By:

SWCA Environmental Consultants
10245 West Little York Road, Suite 600
Houston, Texas 77040

For Approval By:

U.S. Army Corps of Engineers
Galveston District
Interagency Review Team

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1.0 Introduction

Section 404 of the Clean Water Act (CWA) (33 USC 1344 et seq.) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) authorize the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into waters of the United States (U.S.), including wetlands, and for activities in or affecting navigable waters of the United States. The Department of the Army (DA), through the U.S. Army Corps of Engineers (USACE) Regulatory Program, makes decisions to issue or deny permits based on a public interest review (33 CFR Parts 320-330) and, for activities subject to regulation under Section 404, in compliance with the U.S. Environmental Protection Agency's (EPA) *Guidelines for the Specification of Disposal Sites for Dredged and Fill Material* (40 CFR Part 230), known as the Section 404(b)(1) guidelines.

The USACE requires mitigation for adverse impacts to waters of the U.S., including wetlands, associated with activities regulated under Sections 404 and 10 that are likely to occur and that would be of importance to the human or aquatic environment. The Council on Environmental Quality has defined mitigation to include avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. The 404(b)(1) guidelines provide tools to evaluate impacts to the aquatic ecosystem and measures that can be taken to minimize those impacts. For those impacts that remain after all appropriate steps to avoid and minimize adverse impacts have been taken, appropriate and practicable compensatory mitigation is required to offset those remaining unavoidable adverse impacts.

Guidance pertaining to the type and extent of mitigation that may be required by the USACE is provided in the February 6, 1990, *Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act 404(b)(1) Guidelines*. The memorandum of agreement (MOA) also emphasizes the importance of a national goal to achieve an overall no net loss of the nation's remaining wetlands base.

Compensatory mitigation includes restoring, enhancing, establishing (creating), and/or in, certain circumstances, preserving the aquatic system functions that would be lost or impaired due to a USACE-authorized activity. Compensatory mitigation may be implemented to offset the adverse impacts of one or more USACE-authorized projects within a single consolidated mitigation project. Consolidated mitigation projects generally result in greater overall environmental benefit than those achieved with numerous, small, individual mitigation projects and are usually more cost-effective to implement.

The 1990 mitigation MOA noted, without providing further guidance, that mitigation banking may be an acceptable form of compensatory mitigation under certain conditions. The USACE (1995) issued guidance that detailed how mitigation banks could be used to satisfy the mitigation requirements of the 404(b)(1) guidelines. More recently, the USACE and EPA jointly issued the *Compensatory Mitigation for Losses of Aquatic Resources* (CMLAR) for the purpose of establishing standards and criteria for the use of all types of compensatory mitigation, including mitigation banks, to offset unavoidable impacts to waters of the U.S. authorized under Section 404 of the Clean Water Act (USACE-EPA, 2008). The CMLAR further explained that previously issued guidances (USACE, 1995 and USACE, 2002) were "no longer to be used as compensatory mitigation policy in the [USACE] Regulatory Program." As such, the CMLAR now acts as the governing policy for all USACE mitigation projects.

The CMLAR defines a mitigation bank as "a site, or suite of sites, where resources (e.g., wetlands, streams, riparian areas) are restored, established, enhanced, and/or preserved for the purpose of providing

compensatory mitigation for impacts authorized by DA permits." In general a mitigation bank provides compensatory mitigation credits to "a permittee whose obligation to provide compensatory mitigation is transferred to the mitigation bank sponsor." The bank sponsor typically funds the establishment of the mitigation bank in anticipation of recouping that investment by selling mitigation credits to offset adverse project impacts to the aquatic environment authorized through the issuance of permits under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899.

Through the CMLAR, the USACE and EPA recognize that the potential advantages of mitigation banking over other forms of compensatory mitigation include reduction of risk, uncertainty, and temporal loss of resource functions and services; consolidation of compensatory mitigation on more ecologically valuable parcels; more rigorous scientific and technical analysis, planning, and implementation; site identification in advance; project-specific planning; and significant investment of financial resources. Furthermore, the CMLAR states that "the District Engineer should give preference to the use of mitigation bank credits when these considerations are applicable", thereby establishing a hierarchical preference for (1) mitigation bank credits, (2) in-lieu fee program credits, (3) permittee-responsible mitigation under a watershed approach, (4) permittee-responsible mitigation through on-site and/or in-kind mitigation, (5) permittee-responsible mitigation through off-site and/or out-of-kind mitigation as means of compensation options available to offset USACE-authorized impacts to the aquatic environment.

2.0 Bank Information

2.1 Contact Information

Mitigation Bank Name: GIN CITY MITIGATION BANK
Owner/Sponsor: Gin City Restoration, LLC
Primary Contact: Suzanne Jamison
Mailing Address: P.O. Box 1174
Huffman, Texas 77336
Phone Number: 818-415-1685
Fax Number: 281-324-3100
Email Address: Gin-City@sbcglobal.net

Conservation Easement Holder: Texas Land Conservancy
Primary Contact: Mark Steinbach, PhD.
Mailing Address: 6626 Silvermine Drive, Suite 300
Austin, Texas 78736
Phone Number: 512-301-6363
Email Address: Mark@TexasLandConservancy.org

Environmental Consultant: SWCA Environmental Consultants
Primary Contact: Catherine Mayhew
Mailing Address: 10245 West Little York Road, Suite 600
Houston, Texas 77040
Phone Number: 713-934-9900
Fax Number: 713-934-9906
Email Address: CMayhew@SWCA.com

Financial Assurances Holder: Prosperity Bank – Winnie Branch
Primary Contact: Rhonda Devillier, President
Mailing Address: 146 Spur 5
Winnie, Texas 77665
Phone Number: 409-296-3000
Email Address: Winnie@ProsperityBankTX.com

2.2 Location

The Gin City Mitigation Bank (GCMB) is located approximately 0.78 mile east of the City of Huffman, Texas (Figure 1). The Universal Transverse Mercator zone 15 coordinates for the bank are North 3322858.57 meters and East 301213.86 meters. The entire project site is within the 100-year floodplain or floodway of Cedar Bayou. The site is located along the bayou reach approximately 22.9 miles upstream of Negrohead Lake, which adjoins Galveston Bay.

2.3 Service Area

The service area described herein was developed with consideration of regional watersheds and ecoregions. The bank is located in the inland portion of EPA Level 3 Western Gulf Coastal Plain Ecoregion approximately one

mile east of the southern extent of the South Central Plains Ecoregion as described in *Ecoregions of Texas* (Griffith et al., 2004). The bank is also located in EPA Level 4 Northern Humid Gulf Coastal Prairies ecoregion approximately one mile east of the EPA Level 4 Flatwoods, 10 miles west of the Floodplains and Low Terraces, and 16 miles northwest of the Texas-Louisiana Coastal Marshes ecoregions (Figure 2). Ecoregion boundaries are inexact and are typically gradual. Although the overall forest composition of the forested wetlands may differ slightly in these adjacent ecoregions, they share several dominant woody species (e.g., water oak, willow oak, elm, bald cypress) with varying co-dominant species (Griffith and Omernik, 2009). The similarity of the forested wetland types illustrates that ecoregion boundaries represent an attempt to approximate the ecotone between ecoregions. GCMB's location within the transition zone between two ecoregions provides the unique ability to represent wetland communities of the hardwood forested wetland habitats of both.

In general, the GCMB will be used to compensate for impacts to riverine forested wetland habitats within the service area with the exclusion of impacts to stream ecosystems. Compensation will be provided in the form of riverine forested wetland credits. The bank shall not compensate for any adverse impacts: 1) to waters of the U.S. including wetlands that are under tidal influence or 2) that occur on barrier islands or peninsulas. The entire service area for GCMB is encompassed by the USACE Galveston District.

The primary service area is identified as the North Galveston Bay Watershed (Hydrologic Unit Code (HUC) 12040203), which is wholly encompassed within the USACE Galveston District. The primary service area includes portions of Chambers, Harris, and Liberty counties. Impacts occurring within the primary service area shall be debited on a 1:1 basis.

The secondary service area will provide equivalent ecological mitigation to wetland losses in portions of the West Fork of the San Jacinto River, East Fork of the San Jacinto River, and Buffalo-San Jacinto watersheds (HUC 12040101, 12040103, and 12040104, respectively). This area includes portions of Harris, Liberty, Montgomery, and San Jacinto counties. The Addicks Reservoir, Barker Reservoir, Cypress Creek south of Highway 290, Brays Bayou, and Sims Bayou sub-watersheds as described by Harris County Flood Control District will be excluded from the service area. Furthermore, the EPA Level 3 Texas Blackland Prairie, EPA Level 4 Southern Tertiary Uplands, and EPA Level 4 Texas-Louisiana Coastal Marshes ecoregions within the watersheds will be excluded based on their divergent ecology. The proposed service area excludes all National Wildlife Refuges (NWR), National Forests (NF), State Parks (SP) and Wildlife Management Areas (WMA) including Anahuac NWR, Trinity River NWR, Sabine NF, Sam Houston NF, Lake Livingston SP, San Jacinto Battleground SP, Sheldon Lake SP, Atkinson Island WMA, and Lake Houston Park.

On a case by case basis, the USACE, after coordination with the Interagency Review Team (IRT), may authorize use of the bank outside the primary and secondary service areas or in another habitat type when doing so is appropriate, practicable, and environmentally preferable.

3.0 Authorities

3.1 Purpose

All mitigation banks require a Mitigation Banking Instrument (MBI), which is the legal document defining the establishment, use, operation, and maintenance of the proposed mitigation bank. This MBI serves to ensure compliance with Section 404 of the Clean Water Act 33 USC 1344 et seq, Section 10 of the Rivers and Harbors Act 33 USC 401 et seq and the implementing regulations found at 33 CFR 320-332, which are controlling in any conflict between the MBI and those laws and regulations. The Corps role is regulatory only; the MBI should not be construed as a contract with the Government enforceable at law by the applicant or any third party. The sponsor agrees to the extent allowed by the laws of the State of Texas to defend, indemnify and hold the United States harmless in any action where any party, including the sponsor, the beneficiary or any third party brings a claim, monetary or otherwise, against the United States that relates in any way to the Corps execution of mitigation banking documents for the establishment of this mitigation bank.

The proposed mitigation bank will be used for compensatory mitigation for unavoidable impacts to waters of the United States, including wetlands, that result from activities authorized under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, provided such activities have met all applicable requirements and are authorized by the U.S. Army Corps of Engineers (USACE). All mitigation banks must comply with 33 CFR Part 332 if they are to be used to provide compensatory mitigation for Department of the Army (DA) permits. The Sponsor is responsible for developing, operating, and maintaining the bank subject to the requirements of this MBI; and the Sponsor agrees to satisfy and assume the legal responsibility for the mitigation requirements assigned to a respective permit by the USACE.

The Gin City Mitigation Bank (GCMB) is a bank sited on private lands. While GCMB credits may be used to meet other program requirements and/or debited for other reasons at the discretion of the Sponsor, credits used to satisfy DA Permit requirements must be met independent of the other requirements. Under no circumstances may the same credits be used to provide mitigation for more than one permitted activity.

Under this agreement, Gin City Restoration, LLC (Sponsor) shall: 1) implement and maintain the bank as specified in the MBI, 2) execute and file an approved conservation easement on lands associated with the bank, 3) maintain current accounting records for the bank, 4) manage and monitor the bank for ecological sustainability, and 5) conduct required remedial activities.

3.2 Regulatory Authorities

The establishment, use, and operation of GCMB will be carried out in accordance with, and in consideration of, the following federal and state statutes, regulations, guidelines, policies, and authorities:

- Clean Water Act (33 USC 1251 et. seq.)
- Rivers and Harbors Act (33 USC 403)
- Fish and Wildlife Coordination Act (16 USC 661 et. seq.)
- Regulatory Programs of the U.S. Army Corps of Engineers, Final Rule (33 Code of Federal Regulations (CFR) 320-332)
- Guidelines for Specification of Disposal Sites for Dredged and Fill Material (40 CFR 230)

- Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army concerning Determination of Mitigation Under the Clean Water Act, Section 404(b)1 Guidelines (February 6, 1990)
- Final Rule for the Compensatory Mitigation for Losses of Aquatic Resources issued by the U.S. Army Corps of Engineers and the Environmental Protection Agency (April 10, 2008)
- Water Resources Development Act of 2007 – Section 2036
- Endangered Species Act
- Section 106 of the National Historic Preservation Act
- Food Securities Act of 1985, as amended
- Texas State Water Quality Certification [30 Texas Administrative Code (TAC) §279.12 (2001)]
- Texas State Water Quality Standards [30 TAC § 301 (2000)]
- Texas Parks and Wildlife Code Chapter 14 Powers and Duties Concerning Wetlands
- Texas Coastal Management Program goals and policies

3.3 Interagency Review Team

Multiple state and federal agencies participated in the development of this agreement as members of the Interagency Review Team (IRT). The USACE serves as chair of the IRT and is responsible for making final decisions regarding the terms and conditions of the MBI. Notwithstanding any provision of this agreement to the contrary, the State of Texas retains the authority to require whatever conditions are necessary to satisfy state law regarding Section 401 water quality certifications of USACE permits. The IRT is composed of the agencies and their designated representative listed below. The designees from the IRT agencies are subject to change.

U.S. Army Corps of Engineers
Regulatory Branch
2000 Fort Point Road
Galveston, TX 77553
SWG IRT Chair: Sam Watson
Email: sam.watson@usace.army.mil
Phone: 409-766-3946
Fax: 409-766-3931

National Resources Conservation Service
USDA-NRCS Texas
101 South Main Street
Temple, TX 76501
Dan Keesee
Email: Dan.Keesee@tx.usda.gov
Phone: 254-742-9833

U.S. Fish and Wildlife Service
17629 El Camino Real, Suite 211
Houston, TX 77058
Jeff Hill
Email: Jeffery_Hill@fws.gov
Phone: 281-286-8282
Fax: 281-488-5882

Texas Parks and Wildlife Department
TPWD-Dickinson Marine Lab
1502 East FM 517
Dickinson, TX 77539
Mike Morgan
Email: Mike.Morgan@tpwd.texas.gov
Phone: 281-534-0146
Fax: 281-534-0122

U.S. Environmental Protection Agency – Region VI
Grassland Soil and Water Research Lab
808 East Blackland Road
Temple, TX 76502-6712
Jim Herrington
Email: Herrington.Jim@epamail.epa.gov
Phone: 254-770-6595

Texas General Land Office
Coastal Coordination Council
1700 North Congress Avenue
Austin, TX 78701-1495
Tony Williams
Email: Tony.Williams@glo.texas.gov
Phone: 512-463-5055
Fax: 512-475-0680

National Marine Fisheries Service
4700 Avenue U
Galveston, TX 77550
Heather Young
Email: Heather.Young@noaa.gov
Phone: 409-766-3699
Fax: 409-766-3575

Texas Commission on Environmental Quality
Water Quality Division
12100 Park 35 Circle, MC-150
Austin, TX 78711-3087
Brittany Lee
Email: Brittany.Lee@tceq.state.tx.us
Phone: 512-239-5210
Fax: 512-239-4420

3.4 Legal Responsibility Statement

The Sponsor assumes all legal responsibility for satisfying the mitigation requirements (i.e., the implementation, performance, and long-term management of the compensatory mitigation project approved under this MBI) of Department of the Army (DA) or State permits for which the bank has been utilized or fees have been accepted. The transfer of liability from permittees seeking to use mitigation bank credits to satisfy the mitigation requirements of their particular permit to the Sponsor will be established by: 1) the approval of this MBI by the Sponsor and District Engineer (DE), 2) receipt of a credit transaction report by the DE that is signed and dated by the Sponsor, and 3) the transfer of fees required from the DA permittee to the Sponsor.

The responsibility for financial success and risk to the investment initiated by the Sponsor rests solely with the Sponsor. The regulatory agencies that are parties to this agreement administer their regulatory programs to best protect and serve the public's interest, and not to guarantee the financial success of banks, specific individuals, or entities. Accordingly, there is no guarantee of profitability for any individual mitigation bank. As such, the Sponsor does not construe this agreement as a guarantee that the agencies will ensure sale of credits or that the agencies will forgo other mitigation options that may also serve the public interest. Since the agencies do not control the number of banks proposed or the resulting market impacts upon success or failure of individual banks, in depth market studies of the potential and future demand for bank credits are the sole responsibility of the Sponsor.

3.5 Force Majeure

Any delay or failure that is primarily caused by any conditions beyond the Sponsor's reasonable control and that significantly adversely affects the Sponsor's ability to perform its obligations shall not constitute a default. These conditions may include severe flooding, drought, lightening, earthquake, landslide, arson, wild fire, civil disorder, condemnation, or other taking by any governmental body. If a delay or failure occurs under these conditions, the Sponsor shall immediately give written notice to the USACE and IRT of the delay or failure as well as a proposed remedy and/or adaptive management strategy for restoring compliance with the MBI. In the event of a condemnation or other governmental taking which results in the loss of wetlands, the remedy shall include mitigating for lost ecological functions as calculated by the appropriate hydrogeomorphic model.

3.6 Dispute Resolution

Resolution of disputes about application of this MBI must be in accordance with the CMLAR as stated in 33 CFR 332.8(e).

3.7 Validity, Modification, and Termination of the Mitigation Bank

This agreement is effective on the date it is signed by the Sponsor and the USACE in coordination with the IRT and shall remain in effect until it is modified or revoked. In accordance with 33 CFR 332.8(g), this agreement may be modified as mutually agreed upon between the Sponsor and the USACE, after coordination with the IRT.

However, if the District Engineer warrants, the streamlined review process outlined in 33 CFR 332.8(g)(2) may be used.

Nothing in this agreement shall be construed as altering the responsibilities or empowering new authority in favor of the signatory agencies as specified in existing law, regulation, and policy. The Sponsor will be allowed to implement supplemental mitigation actions or activities to protect or enhance ecological services on the property provided that such activities are consistent with the conservation purposes of the MBI or governing conservation easement.

Any signatory to this agreement other than the USACE or the Sponsor may terminate its participation in this agreement at any time by providing 30 days written notice to the other signatories. Notice of agreement termination will be sent to all signatories. In the event of termination of the agreement, the Sponsor or successor Sponsor shall maintain on-site mitigation to the degree required by the applicable Section 404 permit(s). With regard to any future termination, revocation, or modification of this agreement, the protective mechanisms that direct the bank to protect the aquatic ecosystem shall remain effective in perpetuity.

3.8 Controlling Language

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 MBI by reference and these terms are not legally binding, the specific language within the MBI shall be controlling.

4.0 Mitigation Plan

4.1 Goals and Objectives

The goal of this project is to restore lost physical, chemical, and biological functions of riparian hardwood forested wetlands within the Cedar Bayou watershed on approximately 514.1 acres of a 567-acre property to be known as the Gin City Mitigation Bank (GCMB). The physical structure of the vegetation within the wetland will decrease runoff velocity, thereby increasing water detention time, increasing sediment accretion, and decreasing nutrient loads. The presence of healthy vegetation will, in turn, decrease pollutant concentrations, increase wildlife habitat, and restore nutrient cycles that have been disrupted by agricultural practices and urbanization. An established forest community will also increase floral and faunal biodiversity, increase overall species richness, improve habitat connectivity, and decrease fragmentation along Cedar Bayou. Thus, the expected result of the project will be improved overall ecological functions within the Cedar Bayou watershed.

The objective of GCMB is to establish and/or restore approximately 514.1 acres of riparian forested wetlands through specific management activities including restoring degraded wetland hydrology on the property, establishing a hardwood forested wetland community, and implementing perpetual property protection measures to prevent future development. The Mitigation Plan provides specific measures that will be taken to ensure these objectives are met. The performance criteria that will serve to demonstrate conformance with these objectives are provided in Section 4.8.

4.2 Site Selection

4.2.1 Site Consideration

The most important reasons the site was considered as a mitigation bank include watershed need, site integrity and the potential for long-term sustainability, aquatic habitat diversity, habitat connectivity, trends in land use, and compatibility with adjacent land uses. Based on these conditions and subsequent on-site studies, the Sponsor evaluated the hydrologic conditions, soil characteristics, existing vegetative communities, and opportunities for maximizing gains in ecological functions.

Historic land cover conversion throughout the region has led to fragmentation and the loss of large expanses of hardwood wetlands. In particular, comparing historic and recent aerial images of upper Cedar Bayou (Figures 3 and 4, respectively) demonstrates that wetland forests have been degraded over the past several decades. The bank provides an opportunity to re-establish a large area of wetland habitat contiguous to Cedar Bayou (HUC 12040203) to restore some of this lost biodiversity and will provide needed mitigation options for unavoidable wetland impacts within the service area.

The bank site itself has been continuously farmed since at least 1938 and, therefore, functions below its natural, undisturbed potential. Furthermore, given the site has a low aquatic functional capacity in its current state, the high functional lift potential associated with restoration and subsequent protection of this site makes it desirable as a mitigation bank.

With the majority of the site located on soils associated with the Cedar Bayou floodplain and floodway (Lake Charles and Beaumont clays), establishment of a hardwood forested riparian wetland system is expected to be successful. Practicable hydrological improvements and afforestation of the native floral community with a dominance of hydrophytic vegetation should restore a stable native forest stand. Improvements will include, but not be limited to 1) abandoning farming activities, 2) filling of artificial drains, 3) construction of levees and

berms, 4) restoration of natural surface topography, 5) site preparation, and 6) planting of native hardwood forest species.

Once established, the forested wetlands on the site will improve aquatic functions by restoring the physical structure needed to slow the movement of surface water runoff and floodwaters associated with Cedar Bayou and its tributaries. Decreased runoff velocity provides longer periods of water retention and increased contact time with vegetation, resulting in decreased stream velocity and concomitant sediment accretion (USEPA, 1995). Additionally, increased detention time provides the potential for the degradation of a wide variety of chemical contaminants (Chapman, 2003; Vymazal, 2007). Thus, the restoration efforts will decrease nutrient and particulate pollution in Cedar Bayou.

The landscape-scale benefits of the project include increasing habitat diversity, increasing the acreage of hardwood forested wetlands, widening the riparian corridor, and increasing forest connectivity within the Cedar Bayou watershed. These improvements will increase mobility for wildlife and vegetation associated with hardwood forested wetlands. Furthermore, the contiguity of the site with Cedar Bayou enhances the potential for restoration of high quality wetland features that are communicated over a large expanse of bayou frontage. A mature, native forest stand will increase propagule availability for nearby sites (particularly downstream), increase food resources for wildlife, and produce valuable core habitat for riparian species that have been displaced by deforestation.

The physical, chemical, and biological/ecological benefits are particularly relevant when compared with real estate and infrastructure development trends for Harris County and the nearby areas. Development pressures around Lake Houston, Mont Belvieu, and the entire proposed service area have caused a critical need for mitigation within the region. Recent population growth statistics indicate Houston and the surrounding areas continue to be among the fastest growing urban areas in the nation. Through the 1990s, the population of the Houston-Sugar Land-Baytown Metropolitan Statistical Area grew 25.2%, vastly outpacing the nation's population growth during the same period (13.2%). Since 2000, the population growth rate has been 20% (Harris County, 2012) with the expectation that landscape alteration will continue throughout the service area in the near future. The growth trends indicate that the need for mitigation options should remain high for the foreseeable future.

The establishment of GCMB will help to meet compensatory mitigation purposes for the service area. As of March 2013, no mitigation banks with credits available for public sale were located within the proposed primary service area. Greens Bayou Wetland Mitigation Bank (within Harris County and bearing overlapping service areas with the proposed GCMB) has restricted credit sales to Harris County Flood Control District (HCFCD) or Harris County Public Infrastructure Department projects (Glenn Laird, HCFCD, personal communication). There are three recently approved or pending mitigation banks near GCMB's proposed service area: Spellbottom MB (Walker County), Daisetta Swamp MB (Liberty County), and Gulf Coastal Plain MB (Chambers County). Although these banks may have partially overlapping secondary service areas, none will overlay the primary service area of GCMB.

4.2.2 Site Ownership

All real property to be included within the bank is owned in fee simple by Gin City Restoration, LLC and is pledged for use in the Gin City Mitigation Bank consistent with this MBI. The Sponsor shall be responsible for developing, operating, and maintaining the bank subject to the requirements of this MBI. Because GCMB is the first mitigation bank for Gin City Restoration, the Sponsor has selected SWCA Environmental Consultants

(SWCA) as an environmental consultant. SWCA has worked on several mitigation banks within the Galveston District of the USACE and has provided wetland delineation, functional assessment, and consultation for numerous mitigation bank clients.

The inclusion of the landowner's property and the granting of a conservation easement restricting future land uses for the benefit of the bank shall not convey or establish any property interest on the part of any party to this instrument nor to any purchaser of bank credits. The MBI does not authorize, nor shall it be construed to permit, the establishment of any lien, encumbrance, or other claim with respect to the property, with the sole exception of the right on the part of the United States Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. This exception shall be used to require the Sponsor to implement components of the MBI, including recording any conservation easement, required as a condition of the issuance of a USACE permit for discharges of dredged and fill material into waters of the U.S., including wetlands, associated with construction, operation, and maintenance of the bank.

4.3 Site Protection Instrument

In accordance with Texas Law (Natural Resources Code, Title 8 Chapter 183 Subchapter A), upon approval of the MBI the Sponsor shall dedicate the bank as an aquatic ecosystem preserve in perpetuity with a conservation easement. The draft conservation easement is provided in Attachment B. Once executed and recorded, the USACE and IRT approved conservation easement, which is to be held by Texas Land Conservancy (TLC), will be incorporated by replacement of the draft conservation easement in the MBI.

The conservation easement provides that the site will be protected from land uses that are not consistent with the MBI. With the exception of USACE-approved activities (in coordination with the IRT), the bank shall not be disturbed by activities that would adversely affect the intended extent, condition, or function of the bank. After coordination with the IRT, the Sponsor shall record the USACE-approved conservation easement with the Harris County Clerk and provide a copy of the recorded easement to the USACE. The conservation easement shall not be removed or modified without written approval of the USACE.

4.4 Baseline Information

Historical images, anecdotal accounts, and current conditions suggest that the proposed bank site has been heavily impacted for approximately a century. Channelization of natural waterways, deforestation and conversion to agriculture, soil grading, and subsequent alteration of hydrology have decreased the potential wetland functions for the site to practically zero. Despite the presence of soils conducive to wetland establishment, a legacy of farming on the site has eradicated native wetland species throughout much of the site, leaving only a remnant of disturbed wetlands associated with irrigation canals and ditches. The USACE determined that there were no regulated aquatic resources representing an environmental baseline within the 567-acre site. A detailed description of the baseline conditions for the site follows.

4.4.1 Historical Land Use

The paucity of data regarding pre-settlement use of the property makes determination of the original vegetative community on the property problematic. The earliest known aerial photographs date back to 1944 (Google Earth) and 1938 (NRCS, 2010) and demonstrate that the property had already been cleared for farming (Figure 5). However, these images also indicate that there are heavily forested areas along Cedar Bayou and the nearby San Jacinto River upstream and downstream of the property. More recent photos (1978) reveal that all of the proposed GCMB and adjacent areas were completely in agricultural production, presumably for rice, based on the presence of field terracing and levees. As is common for the region, farm practices and land conversion

have removed any viable evidence of pre-farming land use from the site; therefore, there is no way to determine the exact vegetative cover of this parcel of land prior to the date of the oldest aerial images. Regardless of the pre-settlement land cover on the parcel, a comparison of current and the oldest known aerial images on Cedar Bayou indicates that there has been substantial loss of riparian forests (Figures 3 and 4). The riparian corridor is substantially narrower and less continuous along the bayou reach today than it was historically, indicating that the project will provide Cedar Bayou with forested wetlands that will replace those that have been lost since at least the 1930s.

U.S. Fish and Wildlife Service National Wetland Inventory (NWI) mapping, depicts large tracts of palustrine emergent farmed (PEMf) wetlands along Cedar Bayou at the site. More importantly, the NWI also depicts large tracts of palustrine forested broadleaf deciduous, temporarily flooded (PFO1A) wetlands along the Cedar Bayou corridor up and down watershed from the site. Additionally, the land comprising GCMB has received a Certified Wetland Determination by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS, 2010; Appendix E). The results of that determination certify that the entire site (including the wetlands delineated by SWCA in 2011) is classified as 'prior converted' (PC) cropland, indicating that the site is not subject to a wetland conservation provision that would restrict feasibility of the site becoming a mitigation bank. Based on the PC designation for the site and interpretation of historical aerial photography and NWI mapping, it is reasonable that riverine forested wetlands could be established on the site.

Farming on the proposed site of the bank has been subsidized through the U.S. Department of Agriculture Farm Service Agency's (USDA-FSA) Direct Payment program, which makes payments to the farmer based on the "crop base" farmed. Crop farming activities have ceased as of spring 2012. Because the Sponsor is not currently farming the land and the Conservation Easement explicitly prohibits farm operations, USDA funds will not be used to establish or operate the bank in the future.

4.4.2 Current Conditions

4.4.2.1 Vegetation

The majority of the site has been managed for agriculture, specifically rice (*Oryza sativa*), soybean (*Glycine max*), and hay production. The remainder of the site consists of forested riparian zones and an agricultural reservoir in the northeast corner (Seaberg Reservoir #1). One palustrine scrub/shrub (PSS) wetland (0.75 acre) and a palustrine emergent (PEM) wetland (1.285 acres) associated with existing agricultural irrigation ditches were delineated (Figure 6). However, both were verified by the USACE to meet PC designation and therefore are not regulated waters of the United States.

A thin stretch of forested riparian community abuts Cedar Bayou (HCFCD #Q100-00-00) along much of the channelized banks adjacent to the property. The riparian strip adjoins a canal extending across the northern border of the project site (HCFCD #Q136-00-00). The forest community of these riparian zones is dominated by sugarberry (*Celtis laevigata*), water oak (*Quercus nigra*), and Chinese tallow (*Triadica sebifera*), whereas the herbaceous layer is dominated by giant ragweed (*Ambrosia trifida*) and wild rye (*Elymus canadensis*).

4.4.2.2 Soils

The association of soils found in the proposed site is typical to their location in the coastal prairie landscape: clay soils in flat, poorly drained floodplain areas. Major soils of the site consist of Lake Charles clay and Beaumont clay (Figure 7). Both of these clays are found on slopes ranging from 0-1% (NRCS, 1976) and are listed as hydric according to the National List of Hydric Soils (NRCS, 2011).

4.4.2.3 Hydrology

In general, the North Galveston Bay watershed (HUC 12040203) has experienced significant hydrologic alterations since the onset of intensive farming in the area. Channelization of major water courses and the addition of levees to direct surface water for agricultural use have altered flow regimes throughout the watershed.

The site itself has also been hydrologically manipulated from pre-farmland use by the construction of agricultural irrigation and flood control canals (Figure 6). Irrigation ditches running along and through the site appear to be man-made. HCFCD flood control ditches Q134-00-00 (WB3), Q134-01-00 (WB4), and Q136-00-00 (WB5) form the western and northern boundaries of the site. These ditches allow for diversion of water during heavy precipitation events but retain water for prolonged periods following rainfall cessation. One surface tributary feature (WB2) appears to be a modified remnant channel of Cedar Bayou (Figures 8 and 9) with an overage width at the ordinary high water mark of approximately 5 feet and length of 3,877 feet. WB2 is not included in the credited acres of the GCMB.

The only other remaining pre-agricultural drainage for the site is Cedar Bayou (HCFCD #Q100-00-00), approximately 8,000 linear feet of which comprises the eastern boundary (Figure 6). As land adjacent to the bayou, the site lies squarely within the floodplain and floodway of Cedar Bayou (Figure 7). However, stream gauge data indicate that overbank flooding events are infrequent downstream of the site and, when they occur, are associated with tropical storms (HCFCD, 2012). Although overbank flooding may be infrequent and the bayou has been channelized for the conveyance of flood waters from the watershed, Cedar Bayou still floods the site under extreme rainfall events as illustrated by the Harris County LIDAR data and Federal Emergency Management Agency's (FEMA) flood elevation maps (Figure 10). These maps also show that only three small areas (2.05 acres total) within the site have higher elevation than the mapped FEMA flood elevation. These areas will be lowered to match the flood elevation during site grading as described in the Mitigation Work Plan (Appendix D Section 3.2).

Because it is apparent that the primary hydrological influence for the site is precipitation with infrequent overbank flooding from Cedar Bayou, the Sponsor commissioned a water budget study. The water budget study conducted by Ince Engineering (Attachment E) determined that typical rainfall years would produce saturated soils throughout each of the four wetland assessment areas (WAAs) for more than 14 consecutive days during the growing season (February 8 through December 20; Malone and Williams, 2010) at a minimum frequency of 5 years in 10 ($\geq 50\%$ probability), the minimum hydrology criterion required by the USACE for wetlands.

4.4.2.4 Threatened and Endangered Species

A threatened and endangered species review was conducted as part of the wetland delineation and is included in Attachment C. Based on this review, the GCMB should have no negative effects on threatened and endangered species due to the lack of suitable habitat existing on the property.

4.4.2.5 Cultural Resources Survey

SWCA performed a cultural resources survey with which the Texas Historic Commission has concurred (Attachment D). The survey did not encounter any cultural or archeological sites within the high probability areas (i.e., Cedar Bayou) of the proposed GCMB.

4.5 Determination of Credits

Mitigation credits will be established as Functional Capacity Units (FCUs), which will be released to the bank once the USACE verifies, in coordination with the IRT, an increase of FCUs from either the initial baseline assessment or a subsequent credit release amount. However, for the purpose of bank viability the Sponsor requests that 35% of their anticipated year 10 FCUs be released in "advance" based on a projected hypothetical functional assessment provided in Appendix A. The USACE and IRT evaluated these projections in consideration of advance credits only and does not approve or agree to their use in future credit determinations. Data from monitoring efforts will be used to determine and adjust the HGMi to reflect the actual conditions as the bank develops and will, therefore, be used to determine the number of credits that will be made available to the bank in future credit releases.

For the bank to be considered acceptable for mitigating wetland impacts associated with DA permits, the vegetation, soils, and hydrology therein must at least meet the wetlands criteria described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0 (Regional Supplement). Credits will be established as FCUs and allotted to the bank once the USACE verifies, in coordination with the IRT, a variation in the FCUs from either the initial baseline assessment or a subsequent credit release amount. FCUs will be added or subtracted from the Bank's ledger according to the amount of functional change within the bank. Wetland Assessment Areas (WAAs) which score lower in FCUs or that do not meet minimum requirement to be classified as wetlands will result in a proportional reduction of credits/FCUs from the ledger. The credit release schedule summarized in Section 5.4 (full description in Appendix B) indicates the schedule by which the credits will be released.

4.6 Mitigation Work Plan

The Mitigation Work Plan for the bank is provided in Appendix D. The Mitigation Work Plan describes the construction, planting, and other bank procedures necessary for wetland re-establishment on the proposed site. Construction will consist largely of establishing earthen berms and microtopographic features to restore hydrology within the site. After completing the hydrological improvements, afforestation and subsequent vegetation management processes will re-establish a hardwood forested wetland community consistent with historic riparian areas along Cedar Bayou.

4.7 Maintenance and Management Plan

The Sponsor will be responsible for all maintenance and management activities required for the bank through the final credit release and then in accordance with the Long-term Management and Stewardship phase (Section 4.10) requirements. This maintenance and management plan consists of activities that ensure the site will be managed in perpetuity as a hardwood wetland preserve. As with any long-term environmental project, the site requires management to ensure that ecological performance standards are supported. This section outlines specific management and maintenance activities that will be undertaken to ensure the bank is able to operate in perpetuity. Regularly scheduled site visits and monitoring activities will identify areas of concern. When necessary, corrective action plans will be submitted to the USACE and IRT for review, comment, and approval.

4.7.1 Site Accessibility

The bank will ensure that all structures and facilities (i.e., fences, roads, trails, berms, low-water crossings) will be properly maintained for as long as necessary to reach performance standards and provide effective access for management and monitoring activities identified in the MBI and conservation easement.

Although current neighboring land uses present little direct threat to the establishment of hardwood forested wetlands, protective fencing may be required to deter trespass by humans, wildlife, or domestic animals that may cause damage to the site. The need for fencing will be based on monitoring efforts and evidence that vegetation or topography has been damaged. If needed, fences and other access controls (e.g., gates, barbed wire) will be sufficient to ensure that unauthorized access is restricted.

Vehicular access will be restricted to grass roadways and trails within the site. Although gravel or sand may be used as spot treatments for erosion, no impervious structure (i.e., concrete, asphalt) will be used to maintain passages. Roads will be restricted to berm tops and other upland areas in which no wetland credits are being sought. Roads will be kept clear of debris and encumbering vegetation and will be as limited as necessary while still permitting necessary access. Access to off-road areas will be restricted to pedestrian traffic once planting efforts are completed.

Easement rights-of-way shall be maintained in their current form. Easement holders will be notified of any changes to passageways or access limitations within the site. If easements become abandoned or otherwise expire, the Sponsor will request the easement to be lifted and will make all efforts to restore the former easement areas.

4.7.2 Berm Maintenance

Based on the design and construction of the berms (Appendix D), the site should not require on-going maintenance activities once vegetation becomes established. The risk of erosion on the earthen berms is minimized by designing shallow approaches and allowing plant growth along the berms. However, the Sponsor will conduct annual inspections of the berms to verify structural integrity. Berm inspections may also be necessary following unusual events (e.g., floods, storms, and unauthorized access). Any erosion detected will be repaired and stabilized.

As with the berms, low-water crossings should require minimal maintenance. The articulated concrete block construction is resistant to degradation and has a long life expectancy (at least 25 years). However, the crossings will also be inspected annually for damage and signs of wear. Because the crossings act as water conveyance points, it may be necessary to remove materials that snag on the crossings so that the crossings remain operational. Damaged or impassable crossings will be cleared, repaired, or replaced by the Sponsor as needed.

4.7.3 Water Management

Based on the water budget (Attachment E), typical rainfall seasons will provide sufficient water throughout the bank to exceed the wetland hydrology criteria specified by the USACE. Filling and plugging existing irrigation ditches and construction of shallow berms according to the Mitigation Work Plan (Appendix D) will reduce rainfall runoff rates, which will prolong inundation events and increase soil moisture. Low-water crossings will provide a means by which flood events on Cedar Bayou may be conducted onto the bank for retention and controlled discharge back into the bayou.

Normal annual precipitation and occasional overbank flooding events are expected to be sufficient to maintain wetland hydrology perpetually; however, GCMB has the potential to provide supplemental water to the site during the early years of forest establishment if rainfall deficits produce drought conditions endangering tree sapling survival. As an emergency measure, the bank Sponsor has an agreement in place that will ensure sufficient water to maintain the wetland hydrology through drought until the tree saplings become established

(first 3 years following planting). Details regarding supplemental water rights agreement are provided in Section 6.1.

Supplemental watering will only be used on the bank under severe drought conditions; as such, watering will only be permitted when certain criteria are met. Although drought severity indices already exist (e.g., Palmer Drought Index), these are typically too spatially broad and have too great of a time lag to allow for efficient small-scale forest management activities. Therefore, the bank site will measure monthly on-site precipitation and will compare these historic precipitation data measured for the Houston WSCMO AP (Bush Intercontinental Airport) as described in the NRCS WETS table. Extreme drought conditions are defined as rain gauge measurements less than one standard deviation below the mean of the WETS data in each of three consecutive months. This criterion corresponds to a three month period during which rainfall for each month is below the 15.9 percentile. Once the triggering criterion is met, the Sponsor may add supplemental water to meet the preceding month's mean precipitation until natural precipitation exceeds the triggering criteria for the month in which the water is used. Once supplemental watering ceases, the three month triggering criteria must be met again for supplemental watering to re-commence. An example based on recent history is provided in Appendix F. This approach provides an empirical, objective mechanism by which local precipitation can be assessed against an acceptable standard while affording the Sponsor a means to protect saplings as they become established.

When supplemental watering is used, the amount will be no more than necessary to meet the mean monthly rainfall for the preceding month. The Sponsor will inform the USACE and IRT whenever supplemental watering will be used during a month. In exceptionally dry conditions that do not meet the above criterion, the Sponsor may request authorization to apply supplemental water from the USACE and IRT. In all cases, the Sponsor will detail the dates, amounts, and duration of all watering events in the annual report. If the USACE and IRT find that supplemental watering exceeds the parameters described above, annual monitoring will be extended by one year beyond the initial 15-year monitoring period for each year excess supplemental watering is used.

4.7.4 Vegetation Management

Long-term vegetation management practices such as mechanical vegetation control, selective herbicide treatments, prescribed burning, temporary plantings intended to suppress invasive or weed species or to stabilize exposed soil, selective tree removal, and water regime management are valuable management tools available to the Sponsor. As such, these tools offer flexibility in initiating appropriate adaptive management strategies, when needed.

4.7.4.1 Woody Community Management

Consistent with the bank's goals, a minimum surviving density of at least 400 stems per acre of trees and shrubs will be maintained through Year 3 with ≥ 250 stems/acre of trees at least six feet tall and planted for at least two years maintained through Year 7. As the stand matures and canopy closure commences, light limitation and competition will decrease population densities which, in concert with forest management strategies, will produce a sustainable and productive community of native tree species with a population density of between 100 and 250 stems per acre (the optimal score for forest density in the HGMi). Aerial canopy coverage will be optimized as the forest stand matures (i.e., $>11\%$ by Year 3, $>34\%$ by Year 7, and $>67\%$ by Year 10).

If the forest overstory (tree stratum) or midstory (shrub-sapling stratum) becomes too densely populated, selective thinning and clearing of competing vegetation may be needed. Thinning emulates plant community dynamics, promotes healthier forest stands, and allows for succession to drive future forest composition. If needed, thinning

cuts will be performed selectively and will not be used until the forest canopy has closed and species reach sexual maturity (approximately Year 5). Any thinning cuts will be performed using hand held equipment. In general, felled trees will be left in place to provide coarse woody debris that will act as habitat for ground-dwelling organisms. If stand composition warrants, interplanting of desirable tree species may be used to increase their proportion of the stand composition and improve species diversity. Planting trees at varying times introduces vertical structural diversity and the natural patchiness that is important to wildlife and stand stability. If needed, interplantings will attempt to replace trees lost from the original planting effort with similar (hard or soft mast) trees.

The Sponsor will ensure that the mature forest stand composition is dominated by desired hardwood species as described in the Mitigation Work Plan (Appendix D). Monitoring activities will confirm that the Performance Standards identified in Section 4.8 are upheld and undesirable and invasive species are controlled as required in Section 4.7.5.

The efficacy of the forest management strategies will be based on data collected from field monitoring stations throughout each WAA and will be reported to the USACE and IRT following the schedule specified in Section 5.3. Data gathered from annual surveys will establish demographic trends for the tree populations and will inform management decisions. If a negative trend is detected, the Sponsor will report this to the USACE and IRT along with suggested management activities for correcting the trend. Corrective actions will be implemented after approval by the USACE in coordination with the IRT.

4.7.4.2 Herbaceous Community Management

Although these species will initially comprise little, if any, of the forest community, supplemental planting, natural regeneration from the seed bank, and propagule influx should allow increases in the herbaceous vegetation within each WAA.

Herbaceous vegetation will be managed to maintain a diverse community that has an average cover of between 31 and 50%. Therefore, relative species richness and evenness (e.g., Shannon-Wiener index values) derived from measured field conditions, relative percent cover, and the species composition detected during monitoring efforts will inform management decisions. Trends toward decreasing biodiversity or unfavorable relative cover will indicate that corrective actions, such as introducing moderate disturbance regimes (Dial and Roughgarden, 1988) or selective replanting, may be necessary to maintain a highly functional herbaceous community. Proposed corrective actions will be provided to the USACE and IRT for comment and will not be implemented without concurrence by those organizations.

4.7.5 Invasive Species Control

Exotic, noxious, and invasive (invasive) plant species compete with desirable plants for resources, thereby reducing the growth potential for desired vegetation (D'Antonio et al., 1998). Among other life history aspects, the genetic plasticity of invasive species and release from predation often allow them to out-compete native species which, in time, may lead to reduced biodiversity within the community. In extreme cases, invasive species can produce monocultures that have detrimental effects on the wildlife that would otherwise use the native habitat (Forseth and Innis, 2004). Therefore, the control of invasive species is a high priority.

In addition to the species identified in the most recent Noxious Plant List in 4 TAC §19.300 (TDA, 2007; Appendix C), GCMB will initiate management efforts for other invasive species if they are detected within the site. For instance, deep-rooted sedge (*Cyperus entrerianus*), Macartney rose (*Rosa bracteata*), privets (*Ligustrum*

sp.), vasey grass, and non-native improved pasture grasses have been identified as invasive species by the IRT. As additional species are identified by the IRT, USACE, and peer-reviewed journals, they will be added to the list of invasive species that will be monitored and controlled.

GCMB will employ biological, manual, mechanical, physical, and/or chemical control methods based on the best management practices for the target species in consideration of the forest community. For all invasive species, GCMB will coordinate with the USACE and the IRT for approval of specific treatment plans that address efficacy along with ecological and economic constraints. Integrating these approaches will help control invasive species, prevent ecological damage within the site, and decrease incidental export of these species to neighboring sites. Regardless of the techniques employed, the focus will be to use the least ecologically damaging option available that will effectively achieve the management objectives specified.

4.7.5.1 Manual Removal

The use of hands or hand tools is an effective way of removing some unwanted species that typically exerts minimal impact on neighboring vegetation. Due to the cost of labor, manual removal is often cost-prohibitive at large scales but may serve as an effective spot treatment. As such, manual removal will be employed in smaller areas or in areas where herbicide treatments must be kept to a minimum and machinery should be avoided. For instance, the Cedar Bayou riparian corridor should not be subjected to mechanical or chemical treatment to prevent damage to existing, established riparian forest stands.

4.7.5.2 Mechanical Removal

For larger areas and areas dominated by monocultures of unwanted species, the use of machinery (e.g., bulldozers, backhoes, or mowers) may be a more effective method. Mechanical removal can be costly in terms of time and physical labor, but it may be cost-effective if large areas require significant vegetation removal. It is also important to note that mechanical removal does not target particular species and the large scale disruption caused by such techniques may facilitate the growth of weedy species, including the invasive species that are targeted.

4.7.5.3 Chemical Removal

Chemical control involves the use of EPA-approved herbicides and is considered the most cost effective, long-term control method available. Chemical compounds function by interrupting normal biological processes within the plant, thereby reducing growth or inducing mortality. Herbicide applications are relatively inexpensive across large scales and can provide some specificity, but the control of specific plants will require judicious application. For instance, treatments must be made when growth stages and weather conditions are optimum. Wind direction and speed must be monitored to prevent drift onto desirable vegetation. Chemical applications will not be done if rain is expected within 48 hours because rain can wash the herbicide off the target vegetation or dilute the herbicide to a concentration that is ineffective.

4.7.5.4 Chinese Tallow Control

One invasive plant species already known to the site, Chinese tallow, will require management concomitant with initial site construction. Chinese tallow can be found in tree, shrub, or herbaceous form and is present within the small PEM and PSS wetlands of the existing site and along the drainage ditches and riparian corridor of Cedar Bayou.

Because of the limited extent of tallow stands within the site, little need for mechanical or manual removal is anticipated; however, some manual removal may occur as part of site preparation. Whenever possible,

mechanical and manual removal will be performed in the early summer (May-June) to coincide with lowest root total non-structural carbohydrate concentration (Conway et al., 1999).

The remaining Chinese tallow will be controlled using herbicides (e.g., Garlon, Roundup, Arsenal, Accord, Clearcast). The manner of treatment will depend primarily on the size of the plant in question. For seedlings and saplings, foliar herbicides should be most effective during the period between seed maturation and leaf fall (Conway et al., 1999) which is generally August through November. For larger saplings (2-6 inches in diameter), the preferred method will be to cut and treat the stump immediately, either with a spray or paint application. Any individuals larger than approximately 6 inches in diameter will be treated with frill or notch application whereby the bark is cut around the tree trunk and herbicide is applied directly into the frills or notches. Because Chinese tallow may reach sexual maturity as early as three years following germination (Duke, 1983), a methodical tallow survey will be performed every two years to detect and treat any identified tallow plants.

4.7.6 Wildlife Management

The site is expected to function as a wetland area and, as such, it will be attractive to a wide range of organisms. Therefore, it is expected that the site will serve as high quality habitat for a rich community of animals in addition to plants, fungi, and microorganisms. The animals within a community provide numerous intrinsic benefits including nutrient cycling, seed dispersal, and pollination. The benefit of wildlife to humans includes aesthetic values as well as resources for outdoor education, fishing, and hunting. However, the interaction of animal and plant communities can be fragile and may be sensitive at various seral and phenological stages. As such, wildlife management strategies may be necessary to ensure the long-term ecological function of the wetland.

Overgrazing and overbrowsing of vegetation by wildlife can lead to stunting of growth, girdling, and direct consumption of trees by wildlife. This, in turn, degrades the vegetative community and may reduce biodiversity through uneven feeding pressure. Large and small scale land cover conversion may also be caused by wildlife (beavers and feral hogs, respectively) in wetland areas. Abnormally high animal population densities, even if only for a brief period, may also cause lasting impacts on aquatic systems (Unckless and Makarewicz, 2007). Significant wildlife impacts on site will be documented as part of the vegetation and infrastructure monitoring performed for the WAAs (Section 4.9).

If physical, chemical, or biological functions of the wetland are experiencing significant negative effects, the Sponsor will take actions to control any detrimental impacts by wildlife. Management actions may include installing fences, using deterrents, live trapping, and/or harvesting to prevent the undesirable activity of animals that pose a material threat to people, native animals, or habitat conditions within GCMB. The Sponsor will harvest exotic species (i.e., those that are not known to be native to the area based on historical county records) to prevent establishment of these organisms within the bank. Invasive native species (i.e., those species that grow to populations that negatively affect other species in the community) will be controlled to prevent loss of biodiversity. Nuisance or problem species include species that are native or naturalized that have demonstrated a negative effect on the establishment and survival of the wetland forest stand (e.g., pigs, beavers that graze on freshly planted saplings) rather than those traditionally considered problematic (e.g., foxes, coyotes). For species to be controlled, the Sponsor will act in accordance with State and Federal regulations and will provide the USACE and IRT notice of intent to carry out control measures for native species before implementing any such activities.

4.8 Performance Standards

Implementation of the restoration activities outlined in the MBI is expected to result in substantial lift in wetland functions. With the exception of advanced credits, the Sponsor must demonstrate positive gains in wetland functions to warrant the release of credits by the USACE to the bank for sale or use as compensatory mitigation. The minimum criteria for a bank to be considered acceptable for mitigating wetland impacts associated with DA permits is the presence of the vegetation, soils, and hydrology within the bank that meet the wetlands criteria described in the Regional Supplement to the Wetland Delineation Manual (USACE, 2010a). Credits will be established as FCUs and released to the bank once the USACE verifies, in coordination with the IRT, the increase of FCUs from either the initial baseline assessment or a subsequent credit release amount. FCUs will be added or, if necessary, subtracted from the Bank's ledger according to the amount of functional change within the bank. WAAs which score lower in FCUs or that do not meet minimum requirement to be classified as wetlands will result in a reduction of credits/FCUs from the ledger respectively. The following list of performance standards provides the minimum level of success to comply with the terms of this MBI.

1. The Sponsor shall record a conservation easement with the Harris County Clerk that has been approved by the USACE in coordination with the IRT and provide a copy of the recorded conservation easement to the USACE Galveston District IRT Chair.
2. As detailed in Section 4.12 and Attachment A, Sponsor shall establish and execute financial assurances approved by the USACE in coordination with the IRT.
3. Within one year of the date the MBI is signed by the USACE, the Sponsor must provide the USACE as-built plan drawings and a signed statement demonstrating that site planting is complete and compliant with the Mitigation Work Plan. This statement must affirm a minimum planting density of 400 stems per acre with at least 70% of the stems representing no less than five hard mast producing species native to the Cedar Bayou watershed that are FAC or wetter with no single species representing more than 25% cover. The Sponsor will submit credit release reports to the USACE and IRT that include wetland delineation, HGMI functional assessment, and a request for USACE approval. The credit release reports will include hydrographs documenting positive wetland hydrology parameters prior to credit release by the USACE in coordination with the IRT.
4. Within two years of USACE receipt of the as-built report, the Sponsor must achieve a minimum density of 400 live stems per acre of species identified in the planting list (Appendix D Table D2), with none representing more than 90 stems per acre.
5. Within six years of USACE receipt of the as-built report, the Sponsor must achieve a minimum density of 250 live stems per acre that are a minimum of three feet in height from the species identified in the planting list, with none of these representing more than 60 stems per acre.
6. Within nine years of USACE receipt of the as-built report, the Sponsor must achieve 67% aerial cover from a tree stratum comprised of a minimum of five tree species identified in the planting list or other natively recruited FAC or wetter species.
7. Deep-rooted sedge (*Cyperus enterianus*), Macartney rose (*Rosa bracteata*), trifoliolate orange (*Poncirus trifoliata*), privets (*Ligustrum* spp.), elephant ear (*Colocasia esculenta*), Johnson grass (*Sorghum halepense*), cogon grass (*Imperata cylindrica*), and all species listed by the most current Texas Department of Agriculture Noxious and Invasive Plant List (Title 4, Part 1, Chapter 19, Subchapter T, §19.300 of the Texas Administrative Code) must comprise less than 5% cover of the herbaceous or shrub-sapling strata and less than 1% of the tree stratum.

8. The Sponsor shall maintain the wetland parameters described in the Regional Supplement and the HGMi functional assessment of baseline conditions or subsequently approved assessments for each WAA.
9. The Sponsor shall conduct the hydrologic improvements in accordance with the specifications of the Mitigation Work Plan. To assess hydrologic improvements, the Sponsor will install and monitor continuous water level recorders at the locations indicated in the Mitigation Work Plan. The hydrographs produced from data collected will be correlated to the field indicators sampled. This will include documentation of precipitation conditions (normal, wet, dry) during the monitoring period using a National Food Security Act Manual WETS analysis, the Palmer Drought Severity Index, or other suitable metric and related to respective functional assessments.
10. Sponsor shall submit all monitoring, transaction, and other reports on time in accordance with the requirements of this MBI.

4.9 Monitoring Requirements

4.9.1 Monitoring Frequency

Monitoring will be performed annually for the first 15 years following signature of the MBI or until all performance standards have been met, whichever is later. The Sponsor shall monitor the bank to document whether or not performance standards are being or have been achieved. However, supplemental monitoring may be necessary in conjunction with potentially damaging events (e.g., floods, fires, and severe drought). Monitoring will be conducted as described in the following sections.

Monitoring will assess the general ecological health of the bank and identify any problems that may need to be corrected. Monitoring activities may identify areas requiring long-term management practices such as: 1) no action, 2) control of nuisance or exotic species, 3) herbicide treatment, 4) prescribed fire, 5) planting or replanting native woody and/or herbaceous vegetation, 6) selective tree harvesting, or 7) other resource management activities.

4.9.2 Infrastructure

Monitoring of infrastructure will consist of inspection and operations checks of all berms, low-water crossings, and any other necessary hardware and equipment (e.g., supplemental irrigation equipment, access control) in use. Monitoring activities must be sufficient to examine evidence of natural and anthropogenic damage to any infrastructure in place. If deficiencies are found, they will be documented and corrective actions implemented as soon as practicable.

4.9.3 Hydrology

To determine the efficacy of hydrologic restoration efforts, piezometers and water level recorders will be monitored at three locations (lowest, median, and highest elevations) within each WAA (Noble, 2006; USACE, 2005). Data from these recorders will be continuously collected and will be compiled annually. The hydrographs generated by these recorders will be correlated to hydrology field indicators sampled and observed throughout the site as well as climatological data from nearby data sources. Hydrographs will be correlated to local rainfall conditions (HCFCD gauges 1840, 1940, and Q100), stream gauge height and discharge measurements for Cedar Bayou (USGS gauge 08067500), Palmer Drought Severity Index, NRCS WETS data, and other suitable metrics relevant to the HGMi to corroborate hydrologic measurements.

Piezometer readings, water level measurements, and use of any supplemental watering (only allowed during the 5 years following initial planting) will be graphed and compared with previous monitoring data to determine the

level of conformance with the performance standards. Indicators of hydrology (as described in the 1987 Manual and Regional Supplement) and soil profiles will also be recorded for all vegetation monitoring stations during each monitoring event. If the data indicate the WAA is failing to demonstrate adequate soil moisture measurements, additional hydrology improvements may be warranted. The degree to which soil hydrology is being maintained will be incorporated in the HGMi model to provide validation of mitigation credit availability.

4.9.4 Vegetation

Following initial planting of the bank, permanent monitoring stations will be established within each WAA. To sufficiently represent each wetland assessment area, 0.1-acre, fixed-radius (37' 3") sample monitoring station plots will be located within approximately 20-acre blocks of each WAA (Table 4).

Table 4. Number of vegetation sampling stations for each Wetland Assessment Area (WAA).

WAA Unit	Acreage	Sample Stations
1	175.3	9
2	180.4	9
3	82.9	4
4	75.5	4

This sampling protocol ensures an accurate measure of stem density, properly estimates basal area, and avoids increased expenses associated with larger plot sizes (Becker and Nichols, 2011). Assessment data that substantiates the degree of compliance with the performance standards will be gathered from these monitoring stations. The GPS coordinates of each station will be recorded and each will be identified with a T-post sheathed with an 8-foot PVC pipe.

Assessments will be conducted immediately after initial planting and during annual surveys prior to the end of each growing season (October-November) for the first 15 years following signature of the MBI or until all performance criteria are met, whichever is later. These assessments will determine management goals and provide feedback on the success of past management activities.

Quantitative surveys associated with HGMi modeling efforts will occur in years 1, 3, 5, 7, and 10 following initial tree planting. Although HGMi analyses may not be applied in the intervening years, qualitative analyses will be provided to the USACE and IRT to indicate continuing ecological success. For quantitative analyses, the Sponsor will survey forest demographic variables (including identification of trees and saplings by species, survival, diameter at breast height, height class, and cover) using sampling methods commonly applied in forest surveys and similar to those recommended in the *Wetlands Delineation Manual* (USACE, 1987), the *Regional Supplement* (USACE, 2010a), and Ainslie et al. (1999). Images will be taken facing up, down, north, east, south, and west for comparison with planted and maturing stand images. Planted trees within each station will be located using GPS and will be tagged and labeled with a unique identifier. The species, height, and diameter of each tagged stem will be recorded with each assessment. Trees and shrubs generated by volunteer recruitment will also be identified and recorded. These data will then be used to make direct comparisons as well as to generate indices of vegetative status (e.g., basal area) that indicate growth rates. The condition of each tree within the plot (including volunteer trees) will be classified (alive, dead, missing) and height and basal diameter will be measured.

Concurrent with forest vegetation assessments, shrubs, vines, and herbaceous vegetation will be quantified using transects extending 10-meters in a random direction from the center of the station. Shrub and vine (woody understory) cover will be determined using the transect intercept method. The total length of shrub coverage along the transect will be used to estimate density within the stand. Herbaceous vegetation will be assessed using quadrats (1 m²) placed on alternating sides of the transect at each of the odd-numbered intervals (1m, 3m, 5m, etc.). The herbaceous cover within each of the five quadrat samples will be identified and relative percent cover will be estimated for each transect. All vegetation will be identified to the lowest possible taxonomic group and will be categorized by wetland status (scaled from obligate to upland).

In the years that qualitative analysis is used (2, 4, 6, 8, 9, and after 10), the vegetation monitoring stations will be visited to assess the status (alive or dead, general health) of planted and volunteer trees that and to obtain a photographic record. The qualitative surveys will also assess wildlife use and damage to the forest, the condition of berms and low-water crossings, and the overall operability of the bank. Qualitative surveys may be supplanted by quantitative surveys at the Sponsor's discretion; however, the schedule for quantitative surveys will not be altered.

4.9.5 Invasive Species

When performing annual vegetation monitoring, the location and condition of exotic, invasive, and noxious species will be noted. These data will indicate the relative success of control measures and identify areas that may require treatment or additional management activities. In accordance with the adaptive management plan, specific monitoring needs and treatment plans for these plants will be identified as necessary and will be approved by the USACE and IRT.

4.9.6 Monitoring Report

Reports documenting the findings of monitoring efforts will be submitted to the USACE and the IRT by January 31 of each year for the first 15 years following signature of the MBI or until all performance standards have been met, whichever is later. The annual monitoring report will be provided to the USACE and IRT in accordance with RGL 08-03 (USACE, 2008) and will contain the sections described below.

4.9.6.1 Project Overview

This section of the report identifies the bank and the party that conducted monitoring activities. An adequate description (acreage, type of aquatic resources, location, etc.) of the project will be provided to identify the bank. The overview will also contain a timeline of commencement, scheduled actions, and corrective actions. The overview will include a statement of whether the performance standards are being met and specific recommendations for any additional corrective or remedial actions.

4.9.6.2 Requirements

The report will list the monitoring actions as they pertain to each performance standard listed in Section 4.8. The report will provide data to substantiate the progress in meeting the performance standards for each WAA and the bank as a whole. All raw quantitative and qualitative data collected for hydrology and vegetation (see Sections 4.9.3 and 4.9.4) will be included in each monitoring report. Data will be summarized in tables illustrating the degree to which each performance standard has been achieved. Reported hydrology data (Section 4.9.3) will include data gathered from piezometers and water level recorders, hydrology field indicators, soil profiles, dates and volumes of supplemental watering, and additional hydrology improvements, if warranted. Likewise, vegetation data (Section 4.9.4) substantiating the degree to which the bank is meeting the performance standards are met will be provided. Vegetation data will include vegetation assessments, GPS coordinates, HGMi model data, vegetation demographics (e.g., tree/sapling identification, survival, diameter at

breast height, cover, condition, height, basal diameter), photographs, and evidence of wildlife use. Other data, including overall forest condition, condition of berms, and bank operability, will be assessed and summarized in the report.

4.9.6.3 Summary Data

Summary data will be provided to substantiate the success and potential challenges associated with the compensatory mitigation project. Photo documentation will be provided to support the findings and recommendations and to assess compliance with performance standards for that monitoring period.

4.9.6.4 Maps and Plans

Maps will be provided to show the location of the compensatory mitigation site relative to other landscape features, habitat types, locations of photographic reference points, transects, sampling data points, and/or other features. In addition, the submitted maps and plans will clearly delineate each WAA's perimeter, which will assist in locating each WAA of the mitigation bank during subsequent site inspections.

4.9.6.5 Conclusions

A general statement will be included that describes the conditions of the compensatory mitigation project. If performance standards are not being met, a brief explanation of the difficulties and potential remedial actions proposed by the Sponsor, including a timetable, will be provided.

4.10 Long-term Management and Stewardship

Details regarding expected management and maintenance activities involved in establishing the bank (active phase) are enumerated in Section 4.7. However, once performance standards have been achieved and all success criteria have been met, the bank will enter into the long-term management phase with the objective of maintaining the site perpetually. This section provides details regarding the long-term management of the bank.

It is expected that the activities required to perpetually maintain the site will generally be minimal, as the forest is expected to be self-sustaining with management limited primarily to inspections, controlling invasive species, stand thinning, and boundary maintenance. However, mitigation banks may be vulnerable to acts of nature such as wildfires, climatic instability, and disease that are beyond the control of the Sponsor. These events may require changes to the bank including revision of the MBI or activation of adaptive management procedures (Section 4.11). When necessary, the Sponsor will work in coordination with the USACE and IRT to determine what, if any, changes are required for the site to maintain or regain optimum function.

Initially, the Sponsor will act as the long-term steward; however, the Sponsor, after receiving approval from the USACE and IRT, may appoint a separate long-term steward in accordance with 33 CFR 332.7(d)(1). Until such time as a Steward is appointed, the Sponsor shall fulfill all stewardship roles. The bank will continue to function as a mitigation site in perpetuity and will require continued monitoring to ensure ecological functions are maintained. After mutual agreement by the conservation easement holder, the USACE, the IRT, and the Sponsor, monitoring activities may be reduced in frequency and/or scope. Attachment A describes the long-term management endowment that will fund long-term management activities.

4.11 Adaptive Management Plan

Wetlands are living dynamic systems that are influenced by their surrounding landscape and have multiple possible stable states because of their inherently stochastic nature. This means that many external variables beyond the control of the Sponsor will need to be addressed to maintain wetland function. Additionally, as new management techniques and theories develop, the Sponsor may need to integrate them into site management

strategies. An adaptive management strategy provides mechanisms by which ecological goals can be maintained while allowing the Sponsor flexibility in meeting those goals.

The adaptive management framework for the site is based upon the performance standards that serve to indicate the success of the management activities through annual monitoring. Implementation of any adaptive management plan will be based upon the analytical process established by Martin et al. (2005) and will include the following:

1. Compare the analysis of the monitoring data to the performance standards
2. Evaluate whether the site is progressing toward the desired outcome(s)
3. Determine whether any corrective measures are necessary, and, if so, what type
4. Implement any prescribed corrective measures
5. Continue monitoring site progression toward the desired outcome(s)

The process is recursive and allows for the management of the wetlands under unstable and uncertain conditions. In the event that monitoring or other information indicates that the site is not progressing towards meeting the performance standards as anticipated, the Sponsor shall notify the USACE as soon as possible. The Sponsor will submit to the USACE the necessary adaptive management plans that identify the adaptive management considerations, proposed measures, and an appropriate schedule for implementation of any such measures.

The USACE, in coordination with the Sponsor and IRT, shall determine what changes to the site will be in the best interest of the bank before recommending alterations in the management plan based on site-specific conditions. These measures may include, but are not limited to, site plan modifications, design changes, revisions to maintenance requirements, revised monitoring requirements, revised performance standards, and a resulting reduction or increase of credit calculations. The measures must be designed to ensure that the modified compensatory mitigation project provides resource functions comparable to those described in the mitigation plan objectives. Any management change shall be specified in a revised MBI or other appropriate document and will require the approval of both the Sponsor and the USACE, after coordination with the IRT.

With the approval of the USACE, in coordination with the IRT, performance standards may be revised in accordance with adaptive management to account for measures taken to address deficiencies in the mitigation project. Performance standards may also be revised to reflect changes in management strategies and objectives if new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project. No other revisions to performance standards will be allowed except in the case of natural disasters. The streamlined review process provided in CMLAR may be used for any changes to the MBI reflecting adaptive management (33 CFR 332.8(g)(2)).

4.12 Financial Assurances

To accommodate the active and long-term management phases of the mitigation bank, the Sponsor shall provide Financial Assurances (FA) approved by USACE, in coordination with IRT. The financial assurances establish a fiscal bond between the Sponsor and the restoration goals of the bank to ensure that GCMB is able to operate as necessary to meet the compensatory mitigation requirements that have been authorized by the USACE.

The active phase shall be sufficiently funded to provide for all initial site preparation (administration, berm construction, and planting), including 10% contingency in the event the bank fails. A portion of the proceeds from credit sales will be deposited into a non-wasting endowment to provide for any perpetual maintenance activities necessary for long-term care. Funding for the long-term management phase shall be sufficient to provide for the perpetual care of the property as forested wetland. The details of the financial assurance mechanisms are provided in Attachment A.

4.13 Utility and Transportation Corridor and Easements

Although the Sponsor shall make no attempt to encourage the placement of utility easements and transportation corridors within the site, there are several existing easements within the property that must be honored. The rights-of-way (ROW) associated with each easement will be maintained as specified in the ROW agreements. No mitigation credits are being requested from ROW easement acres because these areas will not be subordinate to the conservation easement. However, the Sponsor will continue to maintain these areas as open space and will control invasive species within the ROWs. Should these easements be relinquished, the Sponsor may seek approval from USACE in coordination with the IRT to restore wetlands within these areas and receive additional credits. The Sponsor will coordinate with easement holders to ensure potential negative impacts of the existing ROWs will be minimized.

4.13.1 Located Easements

The creditable acreage within the bank is decreased because of four existing identified easements (3 pipelines and 1 power line) that transect the property (Figure 6). Magnolia Pipeline Company holds a dual pipeline easement that transects the northwest corner of the property. In the northeast corner, Mustang Pipeline Company's dual pipeline easement and Santa Fe Pipeline Company's pipeline are co-located. A Houston Lighting and Power (a.k.a. Reliant Energy) overhead electrical transmission line extends across the southern portion of the bank. Additionally, the power line easement is claimed to extend northward to the west of Cedar Bayou; however, the description of this claimed easement cannot be found. Therefore, the Sponsor proposes that this area be left unforested until the easement can be removed. Although two additional pipeline easements are shown in Figure 1 and Figure 9, these are relicts of the U.S. Geological Survey (USGS) topographic maps and are not identified on any plats of legally recognized easements.

There are also identified easements that are adjacent to the proposed bank. A Union Pacific railroad easement runs parallel to the south side of F.M. 1960 and is tangential to the northwest boundary of the property. Two Harris County Flood Control District easements bound the north (HCFCD #Q136-00-00) and southwest (HCFCD #Q134-00-00 and Q134-01-00) boundaries of the mitigation bank.

4.13.2 Unlocated Easements

The locations of three easements related to the original property (William Keyser Survey, Abstract 500) from which the southern portions of GCMB were subdivided are unknown. The deed to these easements did not specify the location on the property and, as a result, GCMB may be subject to these unlocated easements should these easements become active.

The older two easements (recorded June 17, 1915 and November 30, 1920) were granted to what is believed to be the same pipeline company (listed grantees are The Texas Company and Texas Pipe Line Company, respectively). The prior easement (1915) specified the right to construct, operate, and maintain oil or gas pipeline(s) with associated telegraph and telephone poles and lines within the William Keyser Survey tract. Furthermore, the grantee was given the right of ingress and egress and the installation of a parallel pipeline

upon similar payment to the grantor. It is believed that the latter easement (1920) is the parallel and adjacent pipeline optioned in the former easement description. In each of these deeds, the language stipulates that the easements will be in force as long as the structures involved are maintained.

The third easement was granted to the Sun Pipe Line Company as recorded on July 20, 1956. This pipeline easement specifies a length of eight rods (132 feet in length) within the William Keyser Survey tract. This easement reverts to the landowner upon the termination of use for pipeline purposes.

In all three unlocated easements, the deeds do not specify alignments within the subject property and, therefore, they are applied to all properties within the William Keyser Survey property. WAA 3 and 4 (approximately 157 acres) are subdivided from this property and may be impacted by these easements, if they were to become active. However, based on the acreage of the Keyser Survey (1476 acres), the easements are likely to be outside of the bank footprint. Finally, the deeds to the easements revert to the landowner when the easements are abandoned on the property. It appears that these easements should rightfully be removed because there are no associated structures that are currently known, let alone maintained within the bank property. The Sponsor will continue to work to remove these easements from the property based on abandonment.

The Sponsor believes that these unlocated easements, all of which are between 50 and 100 years old, will not impact the proposed bank. However, in the unlikely event that these easements become active and they are within the bank's conservation easement, GCMB will subtract any mitigation credits associated with the easements from the property and provide appropriate compensatory mitigation for any lost wetland functions.

5.0 Bank Operations

5.1 Credit Accounting Procedures

In 33 CFR 332.2, the CMLAR (USACE-EPA, 2008) defines a credit as:

A unit of measure (e.g., a functional or areal measure or other suitable metric) representing the accrual or attainment of aquatic functions of a compensatory mitigation site. The measure of aquatic functions is based on the resources restored, established, enhanced, or preserved.

Based on this definition, credits will be released to GCMB (beyond advanced credit releases) once the USACE verifies the increase of FCUs from the initial baseline or subsequent credit release amount. FCUs will be added or, if necessary, subtracted from the ledger according to USACE determination. Wetland assessment areas which score lower in FCUs or that do not meet minimum requirements to be classified as wetlands will result in a reduction of credits from the ledger. No more than one credit release that necessitates an HGMi verification from the USACE shall be requested per year.

The Riverine Forested HGMi (USACE, 2010a) functional assessment method will be used to determine the functional capacity of the bank (credits) by quantifying the current and future functional assessment scores of each WAA resulting from implementation of this MBI. Credits for each functional capacity unit category will become available in accordance with the credit release schedule.

To address viability concerns for the GCMB, the Sponsor has requested "advanced credits" (or advanced debiting) of 35% of a projected year 10 lift (Appendix A). Accordingly, upon executing the MBI, filing a USACE-approved conservation easement, and the execution of a USACE-approved financial assurance, 15% of the 10 year projected credits will be released. Additionally, completion of construction and planting activities will result in the release of 20% of the 10 year projected credits (10% for construction and 10% for planting). All subsequent credit releases will occur only when future functional assessments submitted by the sponsor are verified by USACE, in coordination with IRT, to show an increase in FCUs of the three functional categories that exceeds the respective number of the advanced credit released.

To account for potential temporal losses that may be associated with the sale of advanced credits for DA permitted activities, an additional 10% of FCUs from each functional category will be debited from the ledger for every 12 months following credit transaction that an advanced debit is unrealized on the bank. In addition, after 60 months from date of release to the bank, all unsold advanced credits will be revoked until such time that they are earned, as verified by the USACE in coordination with the IRT.

Credits must be traded as a suite of functions (i.e., Temporary Storage of Surface Water (TSSW), Maintenance of Plant and Animal Communities (MPAC), and Removal and Sequestration of Elements and Compounds (RSEC)). Therefore, once credits from any functional category are exhausted, remaining credits in the other functional categories are unavailable as compensatory mitigation until such time as additional credits for any exhausted categories are released by the USACE and added to the account.

The number of credits for each functional category (TSSW, MPAC, and RSEC) shall be debited on a 1:1 basis for impacts within the primary service area or on a 1.5:1 basis for impacts within the secondary service area. On a case-by-case basis, the USACE, after coordination with the IRT, may authorize use of the bank outside both the primary and secondary service areas when unique circumstances make use of the bank appropriate, practicable, and environmentally preferable. Alternate debiting ratios may be required on a case-by-case basis

by the USACE for a project under consideration that is located outside of the service areas. A minimum of one-tenth (0.1) FCU for each functional category shall be debited from the credit availability account for each transaction. If the number of credits required for compensation is a non-integer, then it shall be rounded up to the nearest one-tenth. Applicants have the option to assume a 1.0 surrogate functional capacity index value for each functional category if they choose not to conduct an HGMi functional assessment.

All credit transactions will be recorded in a ledger maintained by the Sponsor. Each ledger entry must include:

- USACE permit applicant's name, address, and telephone number
- USACE permit number or other identification number
- Description of the location (8-digit HUC), nature, and extent of adverse project impacts
- Date of transaction
- Account balance before transaction
- Number of credits debited from the bank
- Account balance after transaction
- Credits currently available

The Sponsor must submit a signed and dated credit transaction notice to the USACE within 15 days of a credit transaction. A copy of each credit transaction will be retained by the Sponsor. Mitigation plans proposing to utilize credits from GCMB as offsets for project impacts must include a statement of credit availability provided by the Sponsor. The Sponsor will work with the USACE to support Sponsor management of reports and ledgers using the USACE Regulatory In lieu fee and Bank Information Tracking System (RIBITS) website or appropriate forum once made available.

An annual summary report of all credit transactions will be provided to the USACE by January 31 of each year until the bank closes. The annual report will include records of any credit releases and debits for the previous year.

5.2 Financial Accounting

A portion of the funds generated from the sale of credits will be used to fund the long-term management fund of the bank. However, the full balance of the long-term management fund must be supplied within seven years following the signing of the MBI, regardless of credit sales. To demonstrate that these deposits are made, the bank will provide the USACE written notification of each deposit made into the long-term management fund within 15 days of any such deposit. The notification will include the date, amount, and transaction receipt as evidence of compliance with the funding requirements.

The long-term management funds will be invested, managed, and accounted for using standard accounting procedures including annual independent audits. Investment of the long-term management funds is defined in the Financial Assurances Plan (Attachment A).

5.3 Reporting Protocols

In accordance with USACE Regulatory Guidance Letter 08-03 (USACE, 2008), the Sponsor shall submit an annual report to the District Engineer and the IRT. The USACE is required to provide monitoring reports to interested federal, tribal, state, and local resource agencies, and the public, upon request. The annual program report must be submitted no later than January 31 or the following business day, if that date falls on a holiday or weekend. Annual reports will be submitted until all credits have been withdrawn or the bank is closed.

5.3.1 Monitoring Report

The annual report will include a monitoring report that will serve to determine the degree to which the project is meeting performance standards and the need for any additional measures necessary to ensure the project is accomplishing its objectives.

5.3.2 Financial Assurances Report

The annual report will include a financial assurances report that will detail bank expenditures and disbursements (i.e., the costs of planning, construction, monitoring, maintenance, contingencies, adaptive management, and administration). The financial assurances report must include:

1. Beginning and ending balances for accounts providing funds for financial assurance,
2. Deposits and withdrawals from accounts providing funds for financial assurance and long-term management, and
3. Information on the amount of required financial assurances and the status of those assurances, including their potential expiration for each individual project.

Additionally, the financial report should make recommendations for upward or downward adjustments of the FA based on the probability of successfully completing pending project plans and perpetual maintenance of the bank. Based on the review of the financial report, USACE may approve such adjustments, pursuant to the requirements of the MBI.

In accordance with 33 CFR 332.3(n)(5), the Sponsor is required to give USACE at least 120 days advance notice if required FA will be terminated or revoked. In addition, the FA instrument must be written in such a way that it is the obligation of the bonding company or financial institution to provide USACE notice. Inclusion of a summary of any changes to the FA in the reporting year does not alter this separate obligation. Both provisions are clearly stated in the financial assurance documents contained in Attachment A.

5.4 Credit Release Schedule

Credit releases are guided by the attainment of performance standards and fulfillment of administrative requirements specified in the MBI according to the following schedule:

1. *Administrative*: Sponsor may apply for a release of 15% of the 10 year projected FCUs available upon the execution of this MBI, filing of the USACE approved conservation easement, ceasing all land uses that are not consistent with this MBI, and establishment of appropriate USACE approved financial assurance mechanisms.
2. *Construction of Hydrologic Improvements*: Sponsor may apply for a release of 10% of the 10 year projected FCUs for each WAA upon construction of hydrologic improvements (e.g., berms, microtopography) as specified in the MWP.
3. *Site Preparation/Planting Activities*: Sponsor may apply for a release of 10% of the 10 year projected FCUs for each WAA upon completion of site preparation and planting operations as specified in the MWP.
4. *Subsequent Credit Releases*: Sponsor may apply for a release of additional FCUs based upon functional improvements of each WAA as documented by site habitat improvements. The quantitation of these FCUs will be based on HGMi calculations derived from field measurements. Functional assessments will be conducted on each unit a minimum of five times, at approximately years 1, 3, 5, 7, and 10 following signature of this MBI by the USACE. Release of these credits at years 3, 5, 7, 10, and beyond may be approved following USACE verification of the Sponsor's determination.

Under no circumstances will credits be sold before they are released by USACE, in coordination with the IRT. If at any time this occurs, GCMB will be immediately suspended. No more than one credit release per year that necessitates an HGMi verification from the USACE shall be requested.

5.5 Contingency Plans and Remedial Actions

In the event the GCMB or a specific part of the bank fails to achieve success criteria as specified in this MBI, the Sponsor shall notify USACE and develop necessary contingency plans to implement appropriate remedial actions for approval by USACE, in coordination with the IRT. In the event the Sponsor fails to implement remedial actions within the USACE-approved timeframe, USACE will take appropriate actions to enforce compliance with the terms of the MBI. If reasonable efforts by the Sponsor fail to bring the bank into compliance with the requirements of the MBI, the USACE will notify the Sponsor, the agent responsible for the transfer of financial assurances, and the third party beneficiary named in the financial assurances of non-compliance. The third party beneficiary may then collect the funds necessary to correct the deficiency and cause corrective action to be taken.

5.6 Provisions Covering the Use of the Land

The conservation easement shall act as the mechanism that protects the bank from land uses contrary to establishment of hardwood forested wetlands. Uses compatible with the purpose of the GCMB as approved by USACE (e.g., hiking, nature viewing, academic pursuits, hunting, and fishing) may be specifically authorized on a case-by-case basis by the Sponsor. The conservation easement wording is provided as Attachment B.

The USACE and IRT are granted permission to perform periodic site inspections to ensure the bank is being operated in accordance with this MBI. In conjunction with the USACE, the IRT will coordinate site visits with the Sponsor by requesting a site visit. Upon receiving a request for a site visit, the Sponsor will schedule a visit for a time that is mutually acceptable to the USACE and the Sponsor.

5.7 Approved Credit Quantities

Upon signature of this MBI, credits will be released in accordance with the requirements and release schedule described in Section 5.4, after approval by USACE in coordination with the IRT.

5.8 Property Transfer

Subject to restrictions dictated by the conservation easement, the landowner may convey fee simple title to, or other forms of property interest in, any property included within the bank provided the necessary protective mechanisms are recorded respective to this MBI. In the event of a transfer in land ownership, the landowner will make a reasonable effort to ensure that the property is conveyed to an environmentally responsible party.

The Sponsor may request to transfer sponsorship of GCMB to another entity, such as a non-profit land trust, governmental entity, or private party provided that the USACE approves the transfer and the new Sponsor agrees to abide by the terms of the MBI or a USACE-approved, modified MBI. Any such request shall be submitted in writing to the USACE and the IRT. Response to such a request of USACE and the IRT shall not be unreasonably withheld. Upon approval of a transfer, all obligations for future performance of the original Sponsor shall be terminated. Unless a substitute financial assurance mechanism is established, all unused funds in the long-term endowment, as well as the right to draw against the account, will be transferred to the successor Sponsor. The physical ownership of bank lands and the operating rights (sponsorship) are separable components and may be transferred independently.

5.9 Bank Expansion

At a future date, the Sponsor may propose the addition of phases to the bank that may include other aquatic habitats (e.g., non-forested wetlands, streams) on land owned in fee simple or contracted by the Sponsor. The Sponsor shall submit the appropriate documentation to the USACE for each proposed expansion and follow the modification process described in 33 CFR 332.8(g). In the event that all or part of this property is taken by exercise of eminent domain or acquired by purchase in lieu of condemnation so as to terminate the conservation easement in whole or in part, the Sponsor is responsible for replacing any wetland mitigation credits lost with in-kind wetland mitigation credits as approved by the USACE in coordination with the IRT.

5.10 Default and Closure Provisions

If the USACE in coordination with the IRT determines that the Sponsor has failed to meet the required compensatory mitigation performance standards, submit monitoring reports in a timely manner, establish and maintain ledgers and report in accordance with the provisions in the Accounting Procedures (Sections 5.1, 5.2, and 5.3), or otherwise comply with the terms of the MBI, the USACE may take appropriate action to enforce compliance. Such actions may include suspending credit sales, decreasing available credits, requiring adaptive management measures, utilizing financial assurances or contingency funds, terminating the MBI, or referring the non-compliance with the terms of the instrument to the Department of Justice. Any delay or failure of the Sponsor to comply with the terms of this MBI shall not constitute a default to the extent that such delay or failure is primarily caused by any force majeure or other conditions beyond the Sponsor's reasonable control that significantly adversely affects its ability to perform its obligations herein, such as severe flooding, drought, lightening, earthquake, landslide, arson, wild fire, civil disorder, condemnation or other taking by any governmental body. The Sponsor shall give written notice to the USACE and IRT if the bank is affected by any such event as soon as reasonably practicable in order to restore compliance.

In the event of default, the USACE may provide written notification of non-compliance to the Sponsor and the third party beneficiary or standby trust responsible for distributing the funds in accordance with the Financial Assurance Plan to facilitate required mitigation activities. The third party beneficiary will collect the funds necessary to correct the deficiency and cause corrective action to be taken.

The bank shall be closed upon the date that the Performance Standards specified in Section 4.8 have been met and documented, and either of the following criteria have been met: 1) the last authorized credit has been transferred and the financial assurance is fully funded for all credits sold, or 2) the Sponsor submits written notice to the USACE stating that the Sponsor is closing the bank and the long-term financial assurance is fully funded for all credits sold. When the USACE approves of this written notice, the banking project shall be deemed complete and the bank will be officially closed. Following bank closure, the conservation easement protecting the bank and aquatic resource functions shall remain effective in perpetuity and long-term stewardship shall commence.

6.0 Additional Information

6.1 Water Rights

Normal annual precipitation and occasional overbank flooding events are expected to be sufficient to maintain wetland hydrology perpetually; however, GCMB has the potential to provide supplemental water to the site during the early years of forest establishment in the event that severe precipitation deficits lead to drought conditions that may endanger tree sapling survival. A Memorandum of Agreement (MOA) between Gin City Land Company (an adjacent landowner) and Gin City Restoration (Sponsor) pledges priority access to the water rights held by Gin City Land Company (Certificate of Adjudication 09-3913) to GCMB (Attachment F). According to the Certificate of Adjudication, Gin City Land Company, Inc. bears agricultural water rights to withdraw up to 1542.376 acre-feet of water annually from Cedar Bayou. The rights further stipulate that Gin City Land Company may retain up to 475 acre-feet in Seaberg Reservoir #1 and 130 acre-feet in Seaberg Reservoir #2. This water right would be sufficient to cover all creditable acres (approximately 514) with approximately 36 inches of water annually.

The MOA stipulates that the water rights are subordinated to use by the bank for the purpose of preventing catastrophic failure of the tree saplings in the event of a prolonged drought. Gin City Restoration will relinquish any claim to the use of water rights to Gin City Land Company within three years of initial planting. At that point, the result of restoration activities should provide typical water retention time (Macdonald et al., 1979) and soil moisture (Manoharan et al., 2009) to the extent that supplemental watering will be unnecessary to prevent soil cracks that may endanger sustained forest growth.

6.2 Mineral Resources

Valuable mineral resources may exist under the land in this bank; however, the subsurface mineral rights for the property are not currently owned by the Sponsor. Recognizing that surface landowners in the State of Texas cannot wholly control a mineral owner's access to those minerals, the Sponsor has developed a Mineral Management Plan (MMP) to reduce the risk of impinging on the mitigation bank (Attachment G).

7.0 Literature Cited

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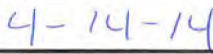
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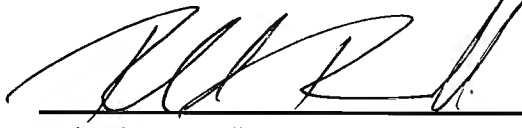
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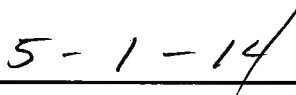
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Date

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U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 6

William K. Honker

Date

Division Director, EPA Region 6 Water Quality Protection Division

Signature Page

U.S. FISH AND WILDLIFE SERVICE

Edith Erfling

Date

Project Leader, Clear Lake Ecological Services Field Office

Signature Page

TEXAS PARKS AND WILDLIFE DEPARTMENT

Carter Smith
Executive Director, Texas Parks and Wildlife Department

Date

Signature Page

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Charles Maguire
Division Director, Water Quality Division

Date

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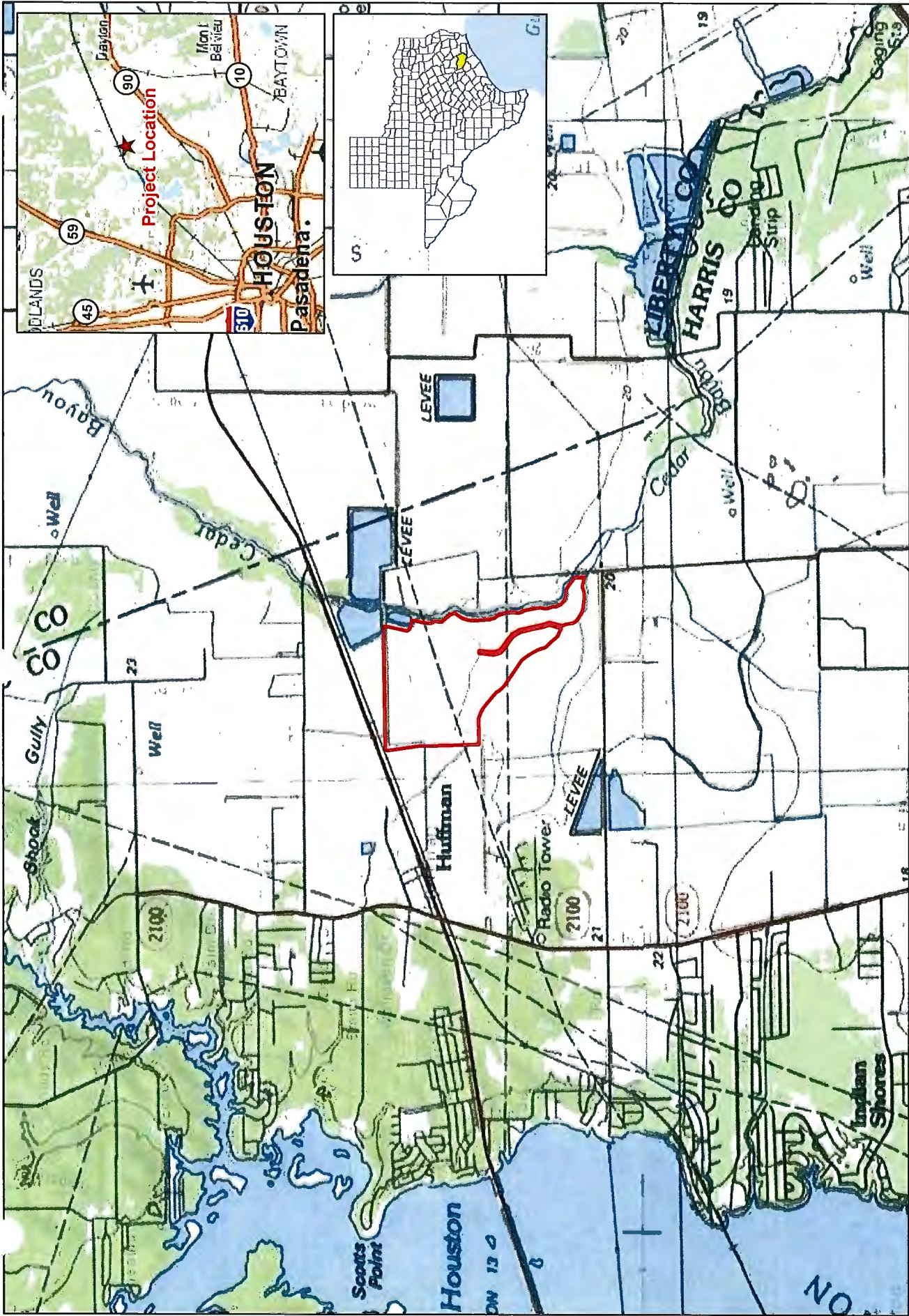
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Commissioner, Texas General Land Office

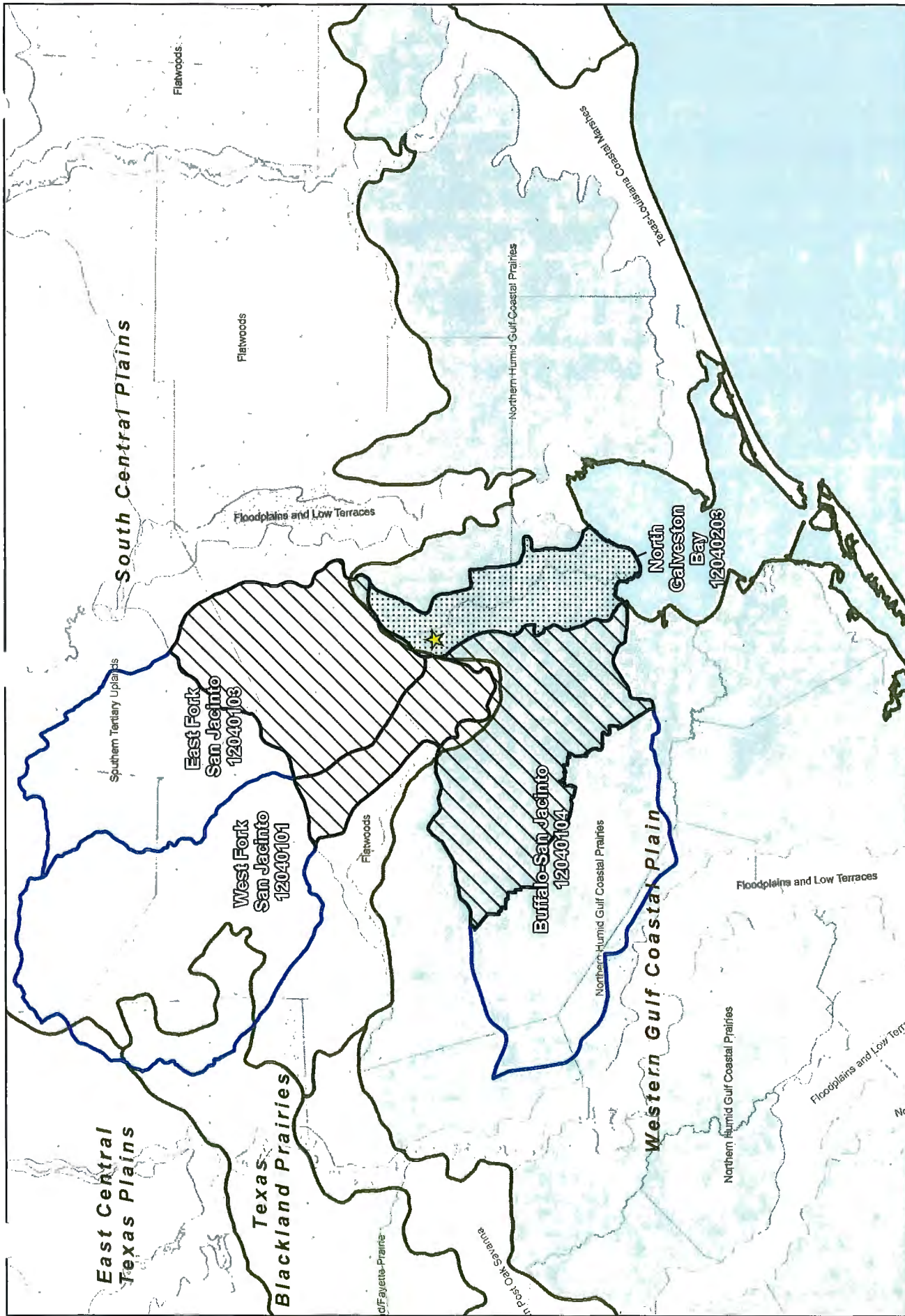
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FIGURES

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<p>Background: NGS Topographic Map SWCA Project No: 22024 Date Produced: 07/10/2024</p>	<p>GIN CITY MITIGATION BANK SITE LOCATION MAP HARRIS COUNTY, TX</p>	<p>SWCA ENVIRONMENTAL CONSULTANTS</p>
<p>Legend: GCMB Boundary</p>	<p>Figure 1</p>	<p>Scale: 0 to 1 Miles NAD 1983 UTM Zone 15 North</p>



 <p>SWCA ENVIRONMENTAL CONSULTANTS</p>	<p>GIN CITY MITIGATION BANK PRIMARY AND SECONDARY SERVICE AREA HARRIS COUNTY, TX</p> <p>Figure 2</p>	<p>★ Gin City Mitigation Bank</p> <p>  Primary Service Area  Secondary Service Area </p>	<p>  HUC Boundary  Level III Eco Region  Level IV Eco Region </p>	<p>Background: Texas Eco-Region Level III and IV Mapper: JS SWCA Project No: 22024 Date Produced: 02/2012</p> <p>  </p> <p>  </p> <p>  </p> <p>NAD 1983 UTM Zone 15 North</p>
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