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Permittee-Responsible Mitigation Plan

for the Landmark Development Project

Waller County, Texas

SWG-2019-00234 | December 23, 2021

Prepared for USACE, Galveston District
Prepared by Resource Environmental Solutions
On Behalf of Landmark Industries, LLC

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Mitigation Plan

1.0 Introduction

Resource Environmental Solutions (RES) is presenting this Permittee-Responsible Mitigation (PRM) Plan on behalf of Landmark Industries, LLC (Permittee) and BGE, Inc. (Agent) for the proposed construction of the Landmark Development Project (Project), U.S. Army Corps of Engineers (USACE) Permit Number SWG-2019-00234, located in Harris County, Texas. This PRM Plan describes the compensatory mitigation proposed for the loss of wetland functions associated with the construction of the Project. The Project will permanently impact 10.61 acres of wetlands, including 4.83 acres of herbaceous wetlands, 0.06 acre of scrub/shrub wetland, 1.91 acres of freshwater pond, and 3.81 acres of forested wetlands. The USACE mitigation hierarchy specified in *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* issued on April 10, 2008 as detailed in 33 CFR 332 (hereafter referred to as the 2008 Final Rule or 33 CFR 332) states that if sufficient and appropriate mitigation bank credits are not available, the next option is the use of an in-lieu fee program. Where permitted impacts are not in the service area of an approved mitigation bank or in-lieu fee program that has the appropriate number and resource type of credits available, PRM is the next available option in the hierarchy (33 CFR 332).

The proposed Project impacts are within the primary service area of one USACE-approved mitigation bank, Greens Bayou Wetland Mitigation Bank, and the secondary service area of another bank, Mill Creek Mitigation Bank. Greens Bayou Mitigation Bank is owned by Harris County Flood Control District and is not currently selling credits to the public. Mill Creek Mitigation Bank is sold out of credits.

According to USACE's Memorandum for Record, Subject: S*WG Watershed Approach for Compensatory Mitigation in the Addicks and Barker Project Region*, compensatory mitigation for impacts to aquatic resource functions within the Addicks & Barker Project Regional Watershed (ABPRW) should be located within the ABPRW in order to restore flood attenuation functions back to the region and watershed and to decrease risks to the Addicks and Barker Reservoirs (USACE 2013; Attachment I). The Project impacts are located in the ABPRW; therefore, pursuant to the USACE 2013 Memorandum, mitigation should be conducted within the ABPRW. The Permittee followed the USACE hierarchy of searching for in-lieu fee programs and found none in the Galveston District. Therefore, the Permittee is proposing one PRM in the ABPRW to mitigate losses of wetland functions at the Project site. Utilizing PRM in the ABPRW follows the guidelines of the USACE 2013 Memorandum and the 2008 Mitigation Rule.

The PRM Site is located only 7 miles from the proposed Project site. The PRM Site is approximately 15.74 acres in the heart of the Katy Prairie and in the Cypress Creek Watershed, which is in the ABPRW. The PRM Site is in the same Ecoregion and 6-digit Hydrologic Unit Code (HUC) 120401 as the Project site. The PRM Site is located just inside 8-digit HUC 12040102 (Spring HUC), while the Project site falls within the adjacent 8-digit HUC 12040104 (Buffalo San Jacinto). The PRM Site is located 700 yards from the Spring HUC/Buffalo San Jacinto HUC boundary.

The Permittee will be responsible for implementation of the PRM Plan, site monitoring, attaining performance standards, and long-term management of the property as described in this PRM Plan, which was prepared in accordance with the 2008 Final Rule (33 CFR 332). RES will act as the Mitigation Agent for the Project.

1.1 PRM Site Location

The proposed Project is located in west Harris County and the PRM Site is located in east Waller County near its border with Harris County. The PRM Site is approximately 7 miles west of the proposed Project, between the cities of Katy and Waller, (Attachment A, Figure 1). The approximate center of the PRM Site is located within the geographic limits of the United States Geological Survey (USGS) 7.5-minute quadrangle "Warren Lake" at coordinates 29.893889° north latitude and 95.871111° west longitude (Attachment A, Figure 2).

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The PRM Site is in the Western Gulf Coastal Plain Environmental Protection Agency (EPA) Level III Ecoregion and Northern Humid Gulf Coastal Prairies EPA Level IV Ecoregion (Griffith et al. 2007). Waller County has relatively flat grasslands in the south and gently rolling post oak savannahs in the north with high levels of conversion to agricultural land use and urban and industrial uses, including oil and gas production. The average temperature of Waller County is 68.3°F, average annual precipitation is 41.16 inches, and average humidity is 72.82 percent (World Media Group 2021). The slope in this region is usually less than 1 percent across the landscape and, according to recent LIDAR data, the elevations across the PRM Site are 165 to 171 feet above mean sea level (AMSL; Attachment A, Figure 4). The entire PRM Site is within the Federal Emergency Management Agency (FEMA) 100-year floodplain of Cypress Creek (Attachment A, Figure 12).

The PRM Site is in the Spring watershed (HUC 12040102). Precipitation sheet flow moves across the PRM Site northward toward Cypress Creek. Cypress Creek flows east through agricultural lands and residential and commercial developments to Spring Creek, reaching Lake Houston and then Trinity Bay (Attachment A, Figure 3).

1.2 Property Ownership and Mitigation Agent Party Qualifications

The PRM Site is owned by Katy Prairie Conservancy (KPC) and RES has a contracted agreement with KPC to place the PRM on the Site, pursuant to this PRM Plan. The PRM Site will be protected by a conservation easement held by Texas Land Conservancy or another land trust that is a member of the Texas Land Trust Council. See Section 4.0 for more details regarding the conservation easement and long-term management of the PRM Site.

RES is the largest, most experienced ecological offset provider in the United States. RES has restored, re-established, and conserved 58,024 acres of protected lands and 297 miles of streams; preserved 9,100 acres of endangered species habitat; planted 14 million restorative trees; and established more than 400 conservation easements. RES' corporate headquarters is located in Bellaire, Texas, only 28 miles from the PRM Site. RES has a profile at: www.res.us.

1.3 Property Legal Definition

The perimeter of the PRM Site is defined in Attachment A, Figure 5. The exact PRM boundary may shift slightly after a survey is completed. The property is subject to a Deed of Trust held by F-T Service Corp., Trustee, dated May 30, 2017 and recorded in/under Document No. 1704065 of the Official Public Records of Waller County, Texas. The beneficiary of the Deed of Trust has agreed to release its interest in the property on which the PRM will be placed upon recording the Conservation Easement (CE) in the Official Public Records of Waller County, Texas. RES will provide proof of this release when the release is recorded immediately subsequent to the recordation of the CE and submitted to the USACE. There are no other liens, mortgages, or security interests on the site. No pipeline easements or other rights of way affect the PRM Site. No known conflicts exist with the conservation purposes of the PRM Plan.

2.0 Objectives

The PRM objective is to provide compensatory mitigation for the permanent impacts to 10.61 acres of wetlands, including 4.83 acres of herbaceous wetlands, 0.06 acre of scrub/shrub wetland, 1.91 acres of freshwater pond, and 3.81 acres of forested wetlands. The compensation will be based on replacement of functions.

Work within the PRM Site will result in the restoration of the following physical, biological, and chemical wetland functions:

1. Physical - Temporary Storage and Detention of Surface Water (TSDSW) – the restored wetlands within the PRM Site will provide temporary water storage during flood events, lessening flood impacts downstream.
2. Biological - Maintenance of Plant and Animal Communities (MPAC) – the restored wetlands within the PRM Site will produce native plant communities that will serve as habitat for local native wildlife populations.

3. Chemical - Removal and Sequestration of Elements and Compounds (RSEC) – the restored wetlands within the PRM Site will remove sediment, heavy metals, man-made chemicals, and other pollutants washed into the system during flood events, improving downstream water quality.

The expected increase in wetland functional values to be provided through the implementation of this PRM Plan would meet or exceed the decrease in functional values expected to result from the proposed Project (Section 6.0).

2.1 Aquatic Resource Type and Functions Restored

Implementation of the PRM Plan will compensate for Project-related loss of Functional Capacity Units (FCUs) through unavoidable fill of wetlands. This will be accomplished within two wetland assessment areas (WAAs) at the 15.74-acre PRM Site. The impacts to herbaceous wetlands, scrub/shrub wetland, and freshwater pond will be mitigated with herbaceous and prairie depressional wetlands (WAA1), and impacts to forested wetlands will be mitigated with forested wetland (WAA2) (Attachment A, Figure 14).

2.2 Methods of Compensation

Methods of compensation are defined in 33 CFR 332.2, including restoration (re-establishment, rehabilitation), establishment, enhancement, and preservation. To determine which method of compensation is being performed at the PRM site, RES conducted a literature review to best determine the historic conditions prior to European settlement.

The PRM Site is located in the historic area of the Katy Prairie. Historically, this area consisted of a mosaic of tall grasses and wetland habitats bisected with wooded riparian corridors (Smeins et al. 1992). Based on paleoclimate data findings of stable temperatures and study of megafuana, literature suggests conditions on the Katy Prairie were likely similar during the Late Pleistocene and Holocene to those of today—a mix of prairies and riparian forests. Prior to European settlement, the majority of the PRM Site was likely tallgrass prairie with scattered oak mottes and forested areas along streams and rivers (Worrall 2021). The geology of the Western Gulf Coastal Plain was such that prior to agricultural conversion, vegetation communities were a series of "gallery" prairies framed/dissected by rivers, streams, and wet riparian forests. According to the Texas Parks and Wildlife Ecological Mapping System (Attachment A, Figure 11), the PRM Site is part of the coastal prairie and wet hardwoods mosaic along Cypress Creek (TPWD 2014).

Based on the earliest available aerial imagery (Attachment A, Figure 6), the PRM Site was cleared for rice farming by the 1940s. Also at this time, a part of Cypress Creek and its tributary that runs northeast of the PRM Site began to channelize. Based on historical information, this area was most likely coastal prairie with forested areas along Cypress Creek and its floodplain. Since the 1940s, the PRM Site has been used for agriculture and pastureland (Attachment A, Figures 7 and 10).

With rice production came a complex series of berms and ditches/canals in the region, including those of the properties surrounding the PRM Site (Attachment A, Figures 7, 9, and 10). The berms and field drains around the PRM Site are still intact. Before these berms, field drains and ditches were created, water from rain events would have flowed across the PRM site as sheet flow. This sheet flow would soak into the soil, raise groundwater tables, and create long hydroperiods. However, present-day, ditches quickly transport water off the PRM Site, which shortens hydroperiods and contributes to deeper groundwater tables. The deepening of Cypress Creek and its tributaries has also contributed to less overbank flooding and deeper groundwater tables, reducing hydrology and hydroperiods at the PRM Site.

It is highly likely the entire PRM Site had longer hydroperiods and was all or nearly all wetland prior to European settlement. It is believed the PRM Site and its vicinity would have been dominated by coastal prairie and forested riparian corridors with prolonged hydroperiods, complex macro and microtopography, and a high degree of edge complexity prior to agricultural conversion. Therefore, there are two compensation methods that are appropriate for the PRM Site.

Re-establishment appears to be the most suitable method of compensation for the proposed herbaceous/prairie depressional wetlands at the PRM Site because the PRM Plan implementation will "return natural/historic functions to the existing uplands that were likely a former aquatic resource" as defined in 33 CFR 332.2. Establishment seems to be the most suitable method of compensation for proposed forested wetlands on the PRM Site because the areas where forested wetlands will be constructed were likely herbaceous wetland prior to European settlement and 33 CFR 332.2 defines establishment as "to develop an aquatic resource that did not previously exist at an upland site."

2.3 Watershed and Ecological Contributions

2.3.1 Ecological and Biodiversity Contributions

The rich soils in the region of the PRM Site have led to the conversion of native habitats to widespread agriculture; additionally, oil and gas and urban developments are common in the area, thereby greatly reducing the range and acreage of high-quality wetland habitats. In addition to the loss of much of the habitat, the area has grown increasingly fragmented to the point that persisting remnants of forested wetland and wetland prairie are disparate, often separated by large expanses of agricultural land. Landscape fragmentation and the reduction in the average size of usable habitat generally leads to reduced biodiversity and population viability of species within these patches (MacArthur and Wilson 1967). Over time, this can lead to the degradation of the ecological community and trophic relationships, both of which are associated with landscape alteration.

The area supports numerous resident and seasonal bird populations along with mammals, reptiles, amphibians, and fishes. Forested habitats along coastal Texas are the first wooded habitats available to neotropical migrants arriving across the Gulf of Mexico near the Upper Texas Coast. Pending climatic conditions and fitness, migrants typically pass over the coast and land inland during southerly winds (Lowery 1974). The Partners in Flight (2008) has identified these wooded habitats as vital for foraging migrants to replenish lipid reserves. Migrating birds use the resources of the forested wetland habitat to replenish energy after spring trans-Gulf migration flights and as a staging area and source of critical fat storage before fall trans-Gulf migration and molt (Barrow et al. 2005).

The PRM Site is located within the Coastal Prairie along the western Gulf coast of the United States, which spans southwest Louisiana and southeast Texas just inland from the coastal marshes. The Coastal Prairie is a tallgrass prairie with scattered oak mottes that can be dominated by little bluestem, brown-seed paspalum, Indiangrass, and switchgrass. This type of ecosystem has been established and maintained by soil type, geology, rainfall, grazers, and fire. The vegetation consists of grasses and a diverse variety of wildflowers. It provides necessary habitat and crucial stopover areas for songbirds, waterfowl, and shorebirds as well as habitat for prairie birds, sand hill cranes, Attwater prairie chickens, and insect pollinators (USFWS and USGS 1999). To maintain this critical habitat, the North American Bird Conservation Initiative has created bird conservation regions (BCR) through which it plans to develop and provide landscape-scale bird conservation (NABCI 2021). The PRM Site falls within BCR 37 Gulf Coastal Prairie, which is headed by the Gulf Coastal Prairie Landscape Conservation Cooperative in order to promote and develop the science for landscape-scale conservation, especially areas deemed critical to support native and migratory species' biodiversity (GCPLCC 2013). The implementation of this PRM supports the ecological goals of these conservation initiatives.

The establishment and re-establishment of wetlands at the PRM Site would restore modified pastureland to conditions similar to what were likely the historic conditions and protect those similar conditions in perpetuity. This will add high quality habitat for insects, birds, mammals, reptiles, amphibians, and other native organisms, and provide an opportunity for bolstered populations in a watershed and ecoregion with only a fraction of pre-settlement habitat remaining. Because the PRM Site is located adjacent to other protected sites, which are adjacent to existing high-quality wetlands, re-establishing and establishing additional wetland habitat will increase the size of usable habitat (patch size) and foster increased broad-scale community dynamics (e.g., metapopulation interactions, dispersal) which will further stabilize native populations and community interactions (Pashley and Barrow 1993). This will also facilitate wildlife and plant migration in response to anticipated transitions associated with predicted climate change (National Fish, Wildlife and Plants Climate Adaptation Strategy Management Team 2012).

2.3.2 Water Quality Contributions

The PRM Site is within the FEMA 100-year floodplain of Cypress Creek (Attachment A, Figure 12). As such, restoration of wetlands within the floodplain will provide important physical and chemical benefits to Cypress Creek and downstream waters, most notably through retention of storm water which decreases downstream velocity, reduces stream eutrophication, and decreases sediment loads in receiving streams (Bernhardt et al. 2005; Gleason and Euliss 1998; Jordan et al. 2003).

Exceedances of water quality standards have been reported in the Cypress Creek watershed, an area including Cypress Creek and its network of tributaries (Cypress Creek Watershed Partners 2020). Four assessment areas and several of its tributaries have been identified in the EPA 303(d) impaired waters list and water quality concerns due to findings of elevated levels of fecal indicator bacteria, depressed dissolved oxygen, increased levels of nitrate and phosphorus, and impaired habitat (Cypress Creek Watershed Partners 2020, TCEQ 2016). The restoration of the PRM Site is expected to help offset these regional anthropogenic impacts.

The restored wetland plant community will also reduce runoff by canopy and leaf litter interception of rainfall, and the increased stem density will reduce surface water sheet flow velocities. These will result in a reduction in runoff and erosion, as well as increased soil infiltration (Richardson et al. 2001). The restored wetland habitat will also reduce pollution sources associated with grazing animals, increase soil organic matter, decrease soil bulk density, increase hydraulic conductivity, increase soil saturation potential, and increase the formation of redoximorphic features (Collins and Kuehl 2001). The restoration of the PRM Site also aligns with the goals of the Cypress Creek Watershed Partnership Protection Plan—to voluntarily address and find solutions for the deteriorating water quality conditions in the Cypress Creek Watershed (Cypress Creek Watershed Partners 2020). Although not an explicit design element of these wetlands, implementation of this PRM, by replacing agricultural land with forested and herbaceous wetland, will provide incidental water quality improvements beneficial to aiding the prevention of further water quality degradation downstream.

3.0 Site Selection

Site selection was an intensive process that included land use analyses and ecologic, hydrologic, and biogeochemical spatial modeling to identify potential sites. Considerations were given to:

- Surface water hydrologic connectivity;
- Hydric status of mapped soil units;
- Geomorphic and vegetative community analysis of historic, extant, and anticipated eco-geologic conditions;
- Compatibility with adjacent land uses;
- Presence of adjacent habitat;
- Level of historic and existing disturbance;
- Willingness of landowners to sell or permanently restrict their properties;
- The likelihood and economic feasibility of successful restoration;
- Location within the same or an adjacent watershed to Project impacts; and
- Location within the ABPRW

In general, the PRM Site is conducive to fulfilling the local watershed needs, achieving long-term sustainability, and providing the potential for net functional increases to downstream waters' physical, biological, and chemical integrity. As described in Section 2.3.1 and 2.3.2, the PRM Site contains ecological and hydrological properties that make it an attractive site from a mitigation perspective. Additionally, the PRM Site is adjacent to several other wetland mitigation sites, providing an opportunity to improve habitat connectivity and increase habitat patch size.

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4.0 Site Protection Instrument

A perpetual conservation easement on the PRM Site will be secured in accordance with Texas Law, Natural Resources Code, Title 8, Chapter 183 Subchapter A. The purpose of such an easement will be to define prohibited activities, which are incompatible with the objectives of the PRM Plan while recognizing allowable and compatible uses. The easement shall be executed and filed in the County Clerk's records of Waller County, Texas. In accordance with the 2008 Final Rule (33 CFR §332.7(a)(3)), the easement shall contain a provision requiring 60-day advance notification to the USACE Galveston District before action is taken to void or modify the easement, including transfer of title.

The conservation easement will protect the PRM Site from development or any other activity contrary to its use as wetland mitigation. The conservation easement will be held by Texas Land Conservancy or another land trust that is a member of the Texas Land Trust Council. Texas Land Conservancy has agreed to hold the conservation easement on the PRM Site and has provided a letter of intent dated October 22, 2021 (Attachment J). The easement holder will verify terms and conditions of the easement annually. Upon execution of the conservation easement, the easement holder will hold and enforce the conservation easement placed on the PRM Site, protecting it in perpetuity as a wetland conservation site.

The easement holder will be responsible for protecting land contained within the PRM Site in perpetuity in accordance with the terms of the conservation easement and PRM Plan unless the land is transferred or sold to a state or federal resource agency or non-profit conservation organization.

5.0 Baseline Information

The 15.74-acre PRM Site consists of upland pasture, berms, and ditches.

5.1 Land Use

The PRM Site is located within the historic limits of the Katy Prairie. The Katy Prairie was historically part of the tallgrass prairie of the North American Great Plains and consisted of a mosaic of tall grasses and wetland habitats and small, circular sandy mounds (called "mima" or pimple mounds), bisected with wooded riparian corridors (Smeins et al. 1992). Originally, the Katy Prairie stretched northwest from the edge of a post oak savannah near Hempstead, Texas to the center of present-day downtown Houston. Based on paleoclimate data findings of stable temperatures and study of megafuana, conditions of the Katy Prairie were likely similar during the Late Pleistocene and Holocene to those today—a mix of prairies, wetlands, and riparian forests.

Native Americans first inhabited the area approximately 13,000 years ago. The Coastal Prairies of Texas were frequently burned by Native Americans. As a result, underbrush and woody vegetation were suppressed and open grassy conditions favorbale for hunting and travel were maintained. It is thought, in the absence of fire, reforestation would have occurred. Such a transition is evident today in the Addicks and Barker reservoirs, which were historically prairie but have almost entirely reverted to forest in the absence of landscape fire (Worrall 2021).

In the 1820's, early Texas colonists came from other states in the southern U.S. with exhausted and depleted soils due to intensive cultivation of cotton. It was the rich bottomoand soils that attracted these early settlers and resulted in large-scale conversion of prairie and bottomland forests to cropland and pasture. By the 20th century, along with agriculture, the development of cities and urban sprawl have been the main causes of landscape alteration in the area (Worrall 2021).

Based on the earliest available aerial imagery (Attachment A, Figure 6), the PRM Site was cleared for rice farming by the 1940s. Also at this time, a part of Cypress Creek and its tributary that runs near the PRM Site began to channelize (Attachment A, Figure 3). Based on historical information, this area most likely was coastal prairie with forested areas along Cypress Creek and its floodplain. Since the 1940s when it was first converted, the PRM Site has remained agricultural land.

The PRM Site has been significantly impacted by agriculture which has resulted in leveling of the topography of the Site, channelization of natural waterways, the creation of a network of dirt roads, berms, and ditches to drain the Site, suppression of native vegetation, and colonization of invasive species. These activities have substantially decreased the hydroperiods, wetland functions, biodiversity, and other ecological services historically provided by the PRM Site. No wetlands or waters of the United States are located on the PRM Site, according to an Approved Jurisdictional Determination issued by the USACE (Attachment C).

5.2 Soils

The PRM site is located on the Lissie Formation, one of two dominant subdivisions of the Pleistocene system. Sediments of the Lissie Formation in the outcrop are continental deposits laid down as floodplain and as delta sands, silts, and mud at the mouths of coastal rivers. During the Wisconsin Glaciation (75,000-11,000 years ago), wide valleys were formed in response to a severe drop in sea level (430 feet lower than today). From the Late Pleistocene period (12,000 years ago) to the present (Holocene Epoch), the sea level rose and valleys were filled with Holocene fluvial sediments. Hydrologic systems and streams flowing across the landscape matured in response to a constant base level (Sellards et al. 1990). These dramatic shifts in sea level and deltaic-fluvial processes resulted in water shaping the relatively flat surface of the Western Gulf Coastal Plain into a mosaic of streams, depressions, flats, swales, depositional ridges, and mima mounds (Moulton and Jacob 2000). The soils on the Lissie Formation are lightly colored, ranging from red to gray, and mostly Alfisols with sandy clay loam surface textures (Griffith et al. 2007).

Two main soil types are mapped within the PRM Site: Cyfair-Katy complex, 0 to 1 percent slopes (ArA) and Katy fine sandy loam, 0 to 1 percent slopes (KaA) (Attachment A, Figure 12; NRCS 2021a). These soil series are formed in loamy fluviomarine deposits derived from the Lissie Formation of the Pleistocene age (USDA and NRCS 1996). As a soil derived from fluviomarine deposits in flats of the coastal prairie, it is moderately to somewhat poorly drained and often demonstrates redoximorphic features. Both soil series occur on the NRCS Hydric Soil List (NRCS 2021a), which indicates that at least a portion of each soil series is likely to meet the NRCS hydric soil definition.

Cyfair-Katy complex soils consist of loamy fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock from the late Pleistocene. The soils are somewhat poorly drained and have slow permeability with high runoff. This soil complex can be found in flats of coastal plains and may become saturated or inundated during January through April.

Katy fine sandy loam soils consist of loamy fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock from the late Pleistocene. The soils are moderately well drained and have moderately slow permeability with low runoff. This soil can be found in flats of coastal plains and its seasonal water table occurs due to episaturation for short periods during the cool months or in periods of excess rainfall.

5.3 Hydrology

The PRM Site is primarily influenced by direct precipitation with periodic flooding from Cypress Creek and its tributaries, which results in intermittent periods of prolonged saturation. Historically, the PRM Site would have received significant volumes of water via overland flow from upslope properties after rain events, which would have created significantly longer hydroperiods. When the property was used for rice farming, depressions were filled and ditches were excavated to allow rapid drainage during wet periods and for dewatering the field prior to rice harvest. This diversion of overland flow and the absence of active water transfer associated with rice farming has likely caused significantly drier conditions on the PRM Site than ever before.

RES prepared a Water Budget (Attachment D) that models inundation and saturation at the PRM Site post-implementation of the restoration plan. The model indicates that during average year conditions, the PRM Site will experience saturation for at least 2 weeks during the growing season, which meets the hydrological definition of a wetland. As demonstrated in the Water Budget, the principal source of hydrology for the PRM Site will be precipitation.

The secondary source of hydrology will be periodic overbank flooding from Cypress Creek and associated tributaries, resulting in intermittent periods of prolonged saturation. Overbank flooding is expected to continue in the future at least 2 out of 5 years (Attachment B, HGMi Tables). The Water Budget (Attachment D) models the predicted hydrology on the Site in an average year and, therefore, does not account for flood events that occur approximately 2 out of every 5 years. The PRM Site is designed to detain minimal surface hydrology. When overbank flooding occurs, water will be allowed to flow off the PRM Site and cause no more inundation than the rainfall which spurred the flooding. While overbank flooding is expected to result in the performance of numerous chemical, biological, and physical functions at the PRM Site, it is expected to have little effect on the duration of inundation and saturation at the PRM Site in an average year, as is modeled in the Water Budget.

The entire PRM Site is located within the FEMA 100-year floodplain of Cypress Creek (Attachment A, Figure 12). This floodplain connects to the upper 100-year floodplains of Bear and South Mayde creeks, forming the Addicks/Barker overflow zone; a critical floodwater attenuation zone servicing the Buffalo-San Jacinto watershed.

National Wetland Inventory (NWI) mapping shows roughly 70 percent of the PRM Site includes palustrine farmed wetlands (Attachment A, Figure 13).

5.3.1 Assurances of Water Rights

The hydrological restoration will utilize natural hydrological processes and does not rely on the usage of water from a surface water source through active management (e.g., pumping, diversion, impoundment, or removal of water through artificial means from a river, stream, or reservoir).

In addition, the PRM Site is exempt from water rights permitting under Section 11.142(b) of the Texas Water Code, which states:

- Section 11.142(b) of the Texas Water Code:

  "Without obtaining a permit, a person may construct on the person's property a dam or reservoir with normal storage of not more than 200 acre-feet of water for fish and wildlife purposes if the property on which the dam or reservoir will be constructed is qualified open-space land, as defined by Section 23.51, Tax Code. This exemption does not apply to a commercial operation."

- Section 23.51 (7)(C) of the Texas Tax Code:

  "'Wildlife management' means: actively using land for a conservation or restoration project to provide compensation for natural resource damages pursuant to … the Federal Water Pollution Control Act (33 U.S.C. Section 1251 *et seq.*)…"

- 30 Texas Administrative Code § 297.21(e) Domestic and Livestock and Wildlife Permit Exemptions (which is relevant because the Texas Water Code does not provide a definition of "commercial operation", so the Texas Administrative Code is referenced for a definition):

  "For the purposes of this subsection, commercial operation means the use of land for industrial facilities, industrial parks, aquaculture facilities, fish farming facilities, or housing developments."

The wetland areas of the PRM Site would encompass less than 15.74 acres and hold water to less than 1 foot in depth—a total volume far less than the exemption threshold. Additionally, the PRM Site is not categorized as a commercial operation under the definition in the Texas Administrative Code. Finally, the PRM Site would not obstruct the flow of any streams, would include no reservoirs with storage greater than 200 acre-feet of water, and is not a commercial operation; therefore, it would qualify for an exemption from water rights permitting.

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5.4 Vegetation

5.4.1 Historical and Current Plant Communities

According to Smeins et al. (1992) and Griffith et al. (2007), the historical vegetation in the Northern Humid Gulf Coastal Prairies EPA Level IV Ecoregion was mostly tallgrass grasslands with a few clusters of oaks, known as oak mottes or maritime woodlands. Little bluestem (*Schizachyrium scoparium*), yellow Indiangrass (*Sorghastrum nutans*), brownseed paspalum (*Paspalum plicatulum*), gulf muhly (*Muhlenbergia capillaris*), and switchgrass (*Panicum virgatum*) were the dominant grassland species in a mixture with hundreds of other herbaceous species across these prairies. Riparian area vegetation begins a change from the north part of the region, where it is generally similar to the floodplain forests of the South Central Plains Ecoregion, to the south where fewer bottomland oaks and hickories occur and pecan (*Carya illinoensis*), sugar hackberry (*Celtis laevigata*), ash (*Fraxinus sp*.), southern live oak (*Quercus virginiana*), and cedar elm (*Ulmus crassifolia*) become the important overstory species.

The Gulf Coast Prairie is dominated by graminoid species such as little bluestem (*Schizachyrium scoparium*), yellow Indiangrass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii*), bushy bluestem (*Andropogon glomeratus*), broomsedge bluestem (*Andropogon virginicus*), beaksedges (*Rhynchospora spp.*), various paspalum species (*Paspalum spp.*) and hundreds of other herbaceous species across the prairie. Understory species that may invade these prairies include baccharis (*Baccharis halimifolia*), sugarberry (*Celtis laevigata*), and honey mesquite (*Prosopis glandulosa*) (TPWD 2014).

Existing upland vegetation on the PRM Site is characterized by species including bermudagrass (*Cynodon dactylon*), bahiagrass (*Paspalum notatum*), narrowleaf marshelder (*Iva angustifolia*), deep-rooted sedge (*Cyperus entrerianus*), sneezeweed (*Helenium amarum*), butterfly gaura (*Gaura lindheimeri*), wing-angle loosestrife (*Lythrum alatum*), annual marsh elder (*Iva annua*), Canadian goldenrod (*Solidago canadensis*), smut grass (*Sporobolus indicus*), and southern dewberry (*Rubus trivialis*) in herbaceous communities.

5.5 Existing Structures and Cultural Resources

The PRM Site contains no structures.

A request was submitted for State Historic Preservation Office (SHPO) consultation to the Texas Historical Commission (THC) on February 18, 2015 (Attachment E). In a response dated March 12, 2015, the THC determined proposed activities within the PRM Site and extended property would result in “no historic properties affected” and indicated the project could proceed.

5.6 Adjacent Properties Land Use

The surrounding adjacent properties consist of a wetland restoration site to the north and agricultural land to the east, west, and south of the PRM Site (Attachment A, Figure 10).

5.7 Threatened and Endangered Species

According to a report generated for the PRM Site by utilizing the U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) website (USFWS 2021a), four threatened or endangered species may be present in the general area: piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), whooping crane (*Grus americana*), and Texas prairie dawn-flower (*Hymenoxys texana*). RES ecologists reviewed the PRM Site for presence/absence of suitable habitat for these species and none was identified. The implementation of the PRM plan will have no effect on threatened or endangered species.

The piping plover, a state listed threatened species, is a small shorebird. Piping plovers live on sandy beaches and lakeshores along the Atlantic Coast (TPWD 2021a). Nesting habitats include high tide line on coastal beaches, sand flats, and sparsely vegetated dunes. Foraging habitats include inter-tidal portions of open beaches, mudflats, wrack

lines, and shorelines of coastal ponds, lagoons, or salt marshes. The Texas coast is the wintering home to approximately 35 percent of the known population (Vinelli 2000). The PRM Site is over 60 miles north of the Gulf Coast, is not located within the species' critical habitat, and does not contain any dunes, mudflats, salt marshes, or other suitable habitat for the piping plover. Also, according to the IPaC website, piping plovers only need to be considered for wind related projects within their migratory route. Since no suitable habitat was identified on-site and this mitigation project does not involve any wind related structures, this mitigation project will have no effect on this species.

The rufa red knot is a shorebird that migrates over 9,000 miles twice a year from breeding grounds in the tundra of the Canadian Arctic to the wintering grounds of the southern tip of South America, northern Brazil, throughout the Caribbean, and along the southeastern and Gulf coasts of the United States. (USFWS 2021b). They use different habitats for breeding, wintering, and migration. Breeding habitats include elevated and sparsely vegetated ridges or slopes, often adjacent to wetlands or lake edges for feeding. Wintering and migration habitats are often muddy or sandy coastal areas (NatureServe 2021b). The PRM Site is over 60 miles north of the Gulf Coast, is not located within the species' critical habitat, and does not contain any suitable habitat for the rufa red knot. Also, according to the IPaC website, rufa red knots only need to be considered for wind related projects within their migratory route. Since no suitable habitat was identified on-site and this mitigation project does not involve any wind related structures, this mitigation project will have no effect on this species.

The whooping crane, a federal and state listed endangered bird, is the tallest bird in North America at nearly 5 feet tall and with a wingspan of over 7 feet. Whooping cranes are all white except for rust-colored patches on the top and back of its head and black primary feathers on its wings. With only a few wild populations, this species migrates from Canada or from the northern United States to the south or southwestern states, including Texas. One known population breeds in the wetlands of Wood Buffalo National Park in Canada and winters in Aransas National Wildlife Refuge near Rockport, Texas. Their breeding habitat consists of open areas near wetlands, and their wintering habitat consists of salt flats and marshes (TPWD 2021b). The PRM Site does not consist of any salt or marshes and. Since no suitable habitat was identified on-site, this mitigation project will have no effect on this species.

The Texas prairie dawn-flower is a federal and state listed endangered plant belonging to the sunflower family (*Asteraceae*). It is a small annual plant, reaching up to 6 inches, that blooms in March and April. It can be found in poorly drained, sparsely vegetated areas at the bases of mima or pimple mounds in open grasslands or in almost barren soils. Soils are typically fine-sandy loams and slightly saline (NatureServe 2021a). The PRM Site has long been altered from prairie habitat to rice production with a series of berms and ditches, then leveled for cattle grazing. The PRM Site is almost entirely covered with vegetation with limited to no bare spots and no mima mounds. RES ecologists conducted site visits and field surveys and no Texas prairie dawn-flowers or suitable habitat for the species were observed. This mitigation project will have no effect on this species.

6.0 Determination of Compensatory Mitigation

The Permittee's environmental consultant, BGE, Inc., provided both pre-construction and post-construction physical, biological, and chemical Functional Capacity Indices (FCI) for wetlands that will be permanently impacted by the Project by applying the *Riverine Herbaceous/Shrub* and *Riverine Forested HGM Interim* models.

Since the impacted wetlands will be permanently filled, it is expected their post-construction FCI will be zero. Therefore, the pre-construction FCI totals represent the total FCI losses resulting from construction of the Project. The FCI totals were then multiplied by the acreage to calculate the Functional Capacity Units (FCU). Project impact FCUs being compensated by PRM are provided in Table 1 and in Attachment B.

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Table 1. Summary of Project Impacts

Watershed	Wetland Type	Acres	Physical FCUs	Biological FCUs	Chemical FCUs
Buffalo-San Jacinto 12040104	Non-forested wetland (Herbaceous wetlands, scrub/shrub wetland, and freshwater pond)	6.8	2.26	3.45	2.62
	Forested wetland	3.81	1.52	2.25	1.71

A 1.5 multiplier was applied to project impacts when determining how much compensatory mitigation was needed because the PRM Site is located on the other side of a HUC line from the impacts (Table 2).

Table 2. Summary of Project Impacts Including 1.5 Multiplier

Watershed	Wetland Type	Acres	Physical FCUs	Biological FCUs	Chemical FCUs
Buffalo-San Jacinto 12040104	Non-forested wetland (Herbaceous wetlands, scrub/shrub wetland, and freshwater pond)	6.8	3.39[a]	5.18[a]	3.93[a]
	Forested wetland	3.81	2.28[a]	3.38[a]	2.57[a]

[a] includes a 1.5 multiplier

The PRM Site receives overflow from Cypress Creek and its tributaries and is located within the 100-year floodplain of Cypress Creek. Therefore, the *Riverine Herbaceous* and *Riverine Forested HGM Interim* models were applied to estimate the mitigation FCUs that would be provided by re-establishment and establishment of herbaceous and forested wetlands (upland to wetland) within the PRM Site. The projected physical, biological, and chemical FCUs (functional lift) expected for the PRM Site were calculated for Year 10 following planting and are provided in Table 3.

Table 3. Wetland Mitigation Summary

PRM Mitigation Approach	Habitat Change	Acres	FCU Lift[a]		
			Physical	Biological	Chemical
Re-establishment	Upland to herbaceous wetland and prairie depressional wetland	7.8	4.97	5.20	4.65
Establishment	Upland to forested wetland	4.7	2.93	3.41	3.49

[a] Supplemental data and calculations can be found in Attachment B regarding the mitigation FCU production.

As shown in Table 4 and Attachment B, the expected Year 10 FCUs to be provided by the PRM Site exceed the FCUs that will be lost by the implementation of the Project. As the PRM Site develops after Year 10, further increases in functional values are expected, but not quantified in this report.

Table 4. Wetland Impact FCUs Compared to Compensatory Mitigation FCUs

Location	Habitat Type	FCU Impacts and Lift[a]		
		Physical	Biological	Chemical
Project Impacts (Including 1.5 multiplier)	Non-forested wetland	3.39	5.18	3.93
	Forested wetland	2.28	3.38	2.57
Compensatory Mitigation	Herbaceous/depressional wetland	4.97	5.20	4.65
	Forested wetland	2.93	3.41	3.49
Excess herbaceous wetland FCUs generated [b]		***1.58***	***0.02***	***0.72***
Excess forested wetland FCUs generated [b]		***0.65***	***0.03***	***0.92***

[a] FCU values have been rounded.
[b] Accounts for 1.5 multiplier.

RES projects that within 10 years of planting, all performance standards (Section 9) will be met and FCU values will continue to increase as the wetlands reach maturity. These additional FCUs in perpetuity should account for any temporal losses of wetland function due to time for implementation of the PRM and the forested area achieving performance standards.

7.0 Mitigation Work Plan

The mitigation work plan is designed to restore longer hydroperiods to the PRM Site as are believed to have existed prior to anthropogenic manipulations (Section 2.2) and are similar to reference sites (Attachment H). Since it is not possible to remove anthropogenic features up-slope and off site to restore overland sheet flow, and it is not possible to restore adjacent tributaries to their pre-settlement conditions to increase frequency and duration of overbank flooding, longer hydroperiods will be restored at the PRM Site through the degradation of ditches that currently drain the Site, installation of low berms, and the addition of landscape depressions and microtopography/roughness to the landscape. The goal is to create longer periods of saturation but not create prolonged inundation other than in the deepest portions of constructed depressions. Construction prior to spring is often not feasible because the ground is typically saturated in the winter and early spring along the Gulf Coast, which severely limits accessibility with heavy equipment. Planting of forested wetland restoration areas will occur in the winter or early spring following construction activities. Planting trees in the dormant winter season helps to achieve higher rates of success.

7.1 Restoration of Hydrology

RES will degrade one ditch that currently drains surface water from the PRM Site. This and other ditches surrounding the PRM Site were constructed as rice farming infrastructure and rapidly move water northward from the PRM Site toward Cypress Creek (Attachment A, Figure 3). RES will degrade the interior ditch by pushing portions of its spoils into it, creating long plugs that will prevent the conveyance of water. Some short portions of the ditch will be left in place to allow water to pool and provide habitat diversity to the PRM Site. Pooling water will also soak into the soil, bringing the local water table closer to the surface and within reach of roots of hydrophytic vegetation. Sections of plugged ditches also tend to create micro-habitats that house dense faunal populations. By degrading the ditch, surface water will no longer have a direct, channelized path to exit the PRM Site and water will be forced to slowly move as overland sheet flow, soaking into the fine sandy loam soils as it moves. This overland sheet flow will contribute to longer hydroperiods and water saturating the soil will persist long after sheet flow subsides. If additional ditches or culverts are observed in the PRM Site during construction, they will be degraded as deemed necessary by the Mitigation Agent.

Roads and berms form the northern and western boundaries of the PRM Site. These berms will be left in place and reinforced if/where needed. Gaps and culverts within them will be plugged and/or removed as deemed necessary by the Mitigation Agent. Two additional berms will be constructed to form the eastern and southern boundaries of the PRM Site (Attachment A, Figure 14). The constructed berms will be approximately 6 to 24 inches in height and approximately 3 to 10 feet wide at the base (Attachment A, Figure 15).

To allow water to flow in and out of the PRM Site, three low water crossings will be constructed in the berms and roads. The low water crossings will be armored with rock or other hard material and will allow the passage of vehicles over them (Attachment A, Figure 16). The low water crossings will be 20 to 30 feet wide at the top and will have gently sloping sides. These low water crossings will maintain a hydrologic connection between the PRM Site and overbank flooding from Cypress Creek. The bottoms of the low water crossings will be set 0 to 6 inches higher than grade (Attachment A, Figure 16). By making the low water crossings narrow in width with tapered sides, and not more than 6 inches higher than grade, berms will detain a thin layer of surface water during heavy flood events, which will increase hydroperiods but not result in excess periods of ponding. This will mimic historic conditions prior to rice berm and ditch construction up-slope. The thin surface water retained by berms and low water crossings will be absorbed into the ground and removed via evapotranspiration (Attachment D, Water Budget).

RES will construct two depressions within the herbaceous wetland re-establishment area (WAA1). The constructed depressional wetlands will have undulating topography with a diversity of shallow depths no more than 10 inches below the surrounding grade and will be surrounded by low upland areas (Attachment A, Figure 14). These depressions and uplands will vary in size and shape, but will generally follow the illustrations on Figure 14 in Attachment A.

Prior to planting the forested wetland establishment area of the PRM Site (WAA2), RES will assess soil conditions and may break up compaction in the top layer of soil or restore surficial roughness to mimic historic conditions that were once common to the area. Adding surficial roughness will also help the PRM Site mimic roughness at the reference sites (Attachment H), which contained 15 and 30 percent dips, hummocks, channel sloughs, and/or other topographic features. A diversity of microtopographic features creates longer hydroperiods, increases soil permeability, and helps establish a more complex wetland vegetation community and a more diverse assemblage of wildlife species. Additionally, microtopography may improve nutrient cycling and removal. The goal of the hydrologic restoration is for the forested wetland portion of the PRM Site to achieve prolonged soil saturation, but not prolonged inundation which would stunt the growth of trees. Restoring microtopography will assist in achieving these conditions. Microtopography may be created in the forested wetland areas prior to planting or in subsequent years by pulling typical farm implements behind tractors such as a deep shank ripper, cultivator, and/or disking implements, which will alleviate soil compaction and deposit small clumps of soil on the ground surface. Other techniques include the creation of scrapes and/or depositions with a bucket/blade and depositing the spoil in small clumps, adding short, curved topographic lines with a rice plow in strategic locations, and/or similar techniques. The microtopographic features are most beneficial when added in the higher places on the PRM Site where longer hydroperiods are needed to create wetland conditions. The features will not be placed on a map; they will be implemented by heavy equipment operators with the on-site guidance of wetland ecologists.

Two continuous shallow groundwater monitoring wells will be installed (one well in each WAA) to monitor hydrology of the PRM Site.

7.2 Restoration of Plant Community

The mitigation work plan will re-establish herbaceous wetlands and establish forested wetlands throughout the PRM Site. For the re-establishment and establishment of vegetation communities, three reference sites were chosen: Reference Site 1 for herbaceous wetlands and Reference Sites 2 and 3 for forested wetlands. These sites were chosen because they have similar ecoregion, watershed, and climatic pattern to the PRM Site. Though the reference sites were chosen based on their similarity to the PRM Site, past conditions, buffers, and some hydrology factors do differ from the PRM Site. Therefore, the reference sites may not exactly match those of the PRM Site's restored wetlands but provide an anticipatory reference wetland in the area. The reference sites were used as a range of variance which can be found within the ecoregion (Attachment H, Reference Sites).

Herbaceous wetland vegetation will be restored by initial planting, seeding, and/or supplemental plantings/seedings as needed. The species selected for planting will be based on species found at the reference site and/or other native wetland species to provide a robust and diverse wetland. Native herbaceous wetland species will be reintroduced to the area by broadcast seeding, transplanting, or planting of plugs. The need to employ supplemental vegetation establishment will be informed by monitoring activities documenting the success of plantings and native recruitment. Results observed during monitoring events will dictate planting method and density decisions.

The target herbaceous plant community will be similar to the herbaceous vegetation found at the herbaceous reference site (Reference Site 1), located approximately 4 miles northwest of the PRM Site. A list of species found at this reference site can be found in Attachment H, Reference Sites.

Although the total dry biomass of the herbaceous layer may be relatively low compared to woody vegetation within forested ecosystems, soft-stemmed plants often account for most of the biodiversity within a forested habitat and are critical to nutrient cycling (Gilliam 2007). Additionally, herbaceous cover provides important wildlife habitat,

food sources, and natural erosion control, as well as the potential for reduced invasive species establishment. It is expected over time that production of propagules from upstream extant riparian and wetland communities and the existing seedbank will fill in the herbaceous stratum of forested wetlands on the PRM Site. Based on flood flow regimes on the Site and prevalence of water-dispersed species, it is anticipated that shade tolerant species will quickly establish on the Site once closed-canopy conditions are achieved.

Vegetation restoration in forested wetlands will occur through direct planting and/or seeding, natural recruitment, and active invasive plant management. In proposed forested areas, a minimum of 484 bare root tree seedlings will be planted per acre on an average of 10-foot by 9-foot centers (Attachment A, Figure 17). This will provide nearly twice as many trees as the reference site (250 trees per acre) and the projected Year 10 HGMi score for tree density. This overplanting accounts for tree mortality and lowers prospects that replanting will be needed. A healthy mature forest in this region of Texas is expected to have between 100 and 250 trees per acre, which is the target density for the forested wetlands at the PRM Site as specified in the performance standards (Section 9.4). If by Year 10 there are greater than 200 living, native trees per acre within the PRM Site (which would lower the HGMi density scoring), trees on the Site will be thinned to meet final performance standards. Species composition will include native trees adapted to floodplain environments within the Western Gulf Coastal Plain and native to Waller County, Texas (NRCS 2021b). Tree species chosen for planting were selected using references specific to the PRM Site and species that were observed in nearby wetland areas (Table 5).

To the extent practicable, RES will preferentially source vegetation from nearby nursery facilities to provide greater control over the quantity and species composition of the seedling stock, greater assurance regarding the source of seeds, decreased seedling mortality from transportation and transplantation, and the ability to produce supplemental seedlings if needed. Seed, root stock, and/or cuttings will be gathered from within the ecoregion. To reduce shock to newly planted trees, forested wetland planting will be conducted during the dormant season.

Prior to planting, GPS-guided equipment may plow, prepare, and sub-soil forested wetland establishment areas of the PRM Site to create rows 10 feet apart that can be accurately planted and easily located in the future. The 10-foot spacing between rows allows access for mowing equipment to shred herbaceous vegetation that may shade and compete with desirable seedling trees with minimal risk of accidental cutting. This will allow trees access to sunlight for efficient growth. This spacing also allows for accurate application of herbicide to combat invasive species (Section 8.5) and lower risk of accidental overspray on the desired plant community. Rows are needed to effectively guide herbicide applicators and avoid desirable seedling trees among and beneath volunteer herbaceous vegetation. Once desirable trees grow tall enough to be seen above herbaceous vegetation, mowing between rows may cease and natural recruitment of native tree and shrub species will be allowed to occur, which will likely fill in the gaps between rows. As the PRM Site matures, rows will likely become less visually apparent.

The tree species to be planted will consist of natives adapted to floodplain environments within the Western Gulf Coastal Plain, and were chosen for planting because they occur at either the forested reference sites or at the PRM Site. The forested reference sites (Reference Sites 2 and 3) currently consist of mature forested communities with a closed canopy and minimal non-native species presence (Attachment H). They are located approximately 3.6 miles northwest of the PRM Site within the same watershed and upstream of the PRM Site at the confluence of Snake and Mound Creeks, which flow into Cypress Creek. Tree species at the reference sites and the PRM Site are listed in Table 5.

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Table 5. Native overstory tree species present at reference sites or nearby wetlands selected for planting in the PRM Site

Species Name	Common Name	Wetland Status*
Celtis laevigata	Sugarberry	FACW
Crataegus viridis	Green hawthorn	FACW
Fraxinus pennsylvanica	Green ash	FACW
Quercus lyrata	Overcup oak	OBL
Quercus nigra	Water oak	FAC
Ulmus crassifolia	Cedar elm	FAC
Ulmus Americana	American elm	FAC

* Wetland Status: OBL= obligate; FACW= Facultative Wetland; FAC= Facultative; FACU= Facultative Upland; n/a= not rated

For initial forested wetland planting, the exact species composition will depend upon seedling availability but will be planted in mixed-species rows to maximize within-stand heterogeneity. Overstory tree species composition will consist of at least five species with no single species accounting for more than 25 percent of the cumulative cover, to be measured by averaging the coverage totals at the monitoring plots. Whenever possible, seedlings will be planted according to species wetness tolerance to minimize mortality (McLeod et al. 2000). Pioneer tree species may be targeted for removal or left onsite during overstory tree establishment (through approximately year 5), if monitoring reveals these species are functioning as a beneficial nurse crop.

8.0 Maintenance Plan

8.1 General

The Mitigation Agent, through contractual obligation with the Permittee, will be responsible for all maintenance activities required for the PRM Site through the 10-year minimum monitoring and achievement of performance standards, then in accordance with the long-term management phase requirements. The PRM Site has been designed to minimize the need for maintenance; however, as with any long-term ecological restoration project, the PRM Site will require active management to ensure ecological performance standards are maintained. Regularly scheduled site visits and monitoring activities will identify any areas which may need attention.

On behalf of the Permittee, the Mitigation Agent will, at a minimum, make annual inspections of the PRM Site to verify that use of the PRM Site is consistent with this document and the conservation easement; and to assess any damage caused by flood, fire, storm, wind, accident, trespass, vandalism, negligence, or other act or event that could cause damage/modifications to the PRM Site.

8.2 Berm Maintenance

The Mitigation Agent will conduct annual inspections of the berms and low water crossings to verify structural integrity. The berms are intended to slow the retreat of water from the PRM Site, but not dam it up. The berms will be wide and low and are planned to be very stable; if gaps open in berms, those features will be assessed and repaired if deemed necessary to meet desired hydrological conditions. Inspections will also be conducted following unusual events (e.g., floods, storms, unauthorized access). The Mitigation Agent will remove materials that may snag on low water crossings if they are causing a hydrologic issue.

8.3 Forested Wetland Vegetation Management

Vegetation management practices such as mechanical vegetation removal, prescribed burning, herbicide treatments, supplemental planting, temporary plantings intended to suppress invasive or noxious species or to stabilize exposed soil, and selective tree removal are valuable management tools which will be employed as needed.

8.4 Herbaceous Wetland Vegetation Management

RES will use mowing, burning, herbicide application, sprigging, plugging, seeding, and/or supplemental plantings/seedings as needed. The need to employ supplemental vegetation establishment will be informed by monitoring activities documenting the success of plantings and native recruitment. This monitoring will dictate planting method and density decisions.

The restoration of the prairie depressional wetlands at the PRM Site includes the creation of upland mounds adjacent to these wetlands. These areas are not intended to provide FCUs and were not included in the credit calculations. In the case these uplands surrounding the restored prairie depressional wetlands develop into herbaceous wetlands, the Mitigation Agent will allow this natural progress to occur and will indicate this change in any subsequent delineation or monitoring reports.

8.5 Invasive or Undesirable Vegetation Management

The Mitigation Agent may employ biological, manual, mechanical, physical, and/or chemical control methods based on best management practices for the removal of undesirable target species such as Chinese tallow (*Triadica sebifera*), deep-rooted sedge (*Cyperus entrerianus*), bahiagrass (*Paspalum notatum*), Vasey's grass (*Paspalum urvillei*), Johnsongrass (*Sorghum halepense*), and Chinese bushclover (*Lespedeza cuneata*). For all invasive species, the Mitigation Agent will implement control techniques based on published research and/or past experience regarding the timing and efficacy of treatment options. Treatment methodologies will be described in the monitoring reports. Integrating the above-described approaches will suppress invasive species, prevent ecological damage within the Site, and minimize incidental export of these species to neighboring sites. Following the construction phase of the PRM Plan, invasive vegetation management will continue as needed. Regardless of techniques employed, the focus will be to use the least ecologically damaging option available that will effectively achieve the management objectives specified.

8.5.1 Manual Removal

The use of hand tools is an effective way of removing some unwanted species, and 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 may be employed in smaller areas or in areas where herbicide treatments must be kept to a minimum and machinery should be avoided.

8.5.2 Mechanical Removal

For larger areas and areas dominated by monocultures of unwanted species, the use of machinery (e.g., bulldozers, backhoes, mowers) may be implemented as a more effective method. Mechanical removal can be costly in terms of time and physical labor but 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, potentially including invasive species being targeted.

8.5.3 Chemical Removal

Chemical control involves the use of EPA-approved herbicides and is a cost-effective, long-term control method available for undesirable plant species. Chemical herbicides function by interrupting normal biological processes/pathways within the plant, thereby reducing growth or inducing mortality. Herbicide active ingredients

that may be employed include, but are not limited to: triclopyr, glyphosate, imazapyr, and imazamox. Herbicide applications are relatively inexpensive across large scales and can provide some specificity, but the control of specific plants will require judicious application. Treatments will be made when growth stages and weather conditions are favorable. Wind direction and speed will be monitored to prevent drift onto desirable vegetation. Chemical applications will not be made if rain is expected soon afterward because rain can wash herbicide off target vegetation or dilute the herbicide to a concentration that is ineffective. Pre-emergent herbicide applications may be made in coordination with tree planting as a best management practice to suppress grassy and broad-leaved weeds and thereby reduce herbaceous competition with young trees. Herbicide applications will be made in full compliance with label instructions.

The Mitigation Agent will make every effort to avoid adverse impacts to herbaceous wetland areas when using herbicide. Preventative measures may include a no-spray buffer around the perimeter, timing of herbicide application to avoid sensitive environmental conditions, and planned management actions.

8.6 Nuisance Wildlife Management

Significant nuisance wildlife impacts on the PRM Site will be documented as part of the vegetation and infrastructure monitoring. Actions may be taken as appropriate to control any detrimental impacts by wildlife, which may include material threat to people, native animals, or habitat conditions. Overgrazing and over-browsing of vegetation can lead to stunting of growth, girdling, and loss of trees. 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 (e.g., beavers, nutria, feral hogs) in wetlands. Abnormally high animal population densities, even if only for a brief period, could also cause lasting impacts on aquatic systems. Management actions may include installing fences, using deterrents, live trapping, and/or harvest to minimize the undesirable activity of animals that pose a material threat to people, native animals, or habitat conditions. The Permittee/Mitigation Agent will act in accordance with state and federal regulations in controlling nuisance species.

9.0 Performance Standards

Performance standards, as detailed in this PRM Plan, refer to measurable physical (including hydrological), chemical, and/or biological attributes that are used to determine if the compensatory mitigation is meeting the restoration objectives of the PRM Site. Compliance with the following performance standards shall demonstrate that the PRM Site is meeting the restoration objectives.

9.1 Initial Performance Standards

The following minimum performance standards will be achieved, measured, and recorded in an as-built report and submitted to the USACE within 18 months of the first Project impacts in jurisdictional areas:

1. Establishment of a conservation servitude in accordance with Section 4.0.
2. Establishment and funding of a financial assurances account in accordance with Section 13.1 and Attachment G.
3. Establishment and funding of long-term financial assurances in accordance with Section 13.2 and Attachment G.
4. Completion of initial planting of forested wetlands with a minimum of 484 stems per acre. The PRM Site will only be planted with species listed in Table 5 (Section 7.2). Tree seedling species composition must consist of at least five species with no single species accounting for more than 25 percent of the total stem count.
5. Completion of initial mowing or burning of the herbaceous wetland area (WAA1), if needed.
6. Establishment and marking of at least three 0.1-acre monitoring plots in the PRM Site (two plots in WAA1 and one in WAA2).
7. Implementation of hydrologic modifications as described in this PRM Plan (Section 7.0, Attachment A. Figures 14-16).
8. Placement of at least two groundwater monitoring wells within the PRM Site (one well in each WAA), as

described in Section 7.1 Restoration of Hydrology and Section 10.1 Monitoring.
9. Submittal of an As-Built Report, as described in Section 10.2.1.

9.2 Interim Performance Standards Years 1-4

The following standards will be measured and proof of each will be submitted to the USACE in yearly monitoring reports associated with Years 1 through 4 (to be measured in the first and fourth growing seasons following planting):

1. Presence of at least 250 living native trees, tree seedlings, or tree saplings per acre in the forested wetland restoration area (greater than ideal density but similar to Reference Sites 2 and 3, and is expected to decrease as forest matures).
2. No more than 10 percent woody vegetation cover in the herbaceous wetland (WAA1).
3. Presence of stable, functioning hydrologic restoration features (proof via photographic documentation).
4. Presence of less than 10 percent areal cover of invasive species in the herbaceous stratum and 1 percent or less areal cover of invasive species in the shrub and tree strata.
5. Financial assurances in place in accordance with Sections 13.1, 13.2, and Attachment G.

9.3 Interim Performance Standards Years 5-9

The following standards will be measured and proof of each will be submitted to the USACE in the yearly monitoring reports associated with Years 5 through 9 (to be measured in the fifth through ninth growing seasons following planting):

1. Presence of at least 175 living native trees, tree seedlings, or tree saplings per acre in the forested wetland restoration area (within the 100-250 trees per acre range that is ideal density according to HGMi).
2. No more than 10 percent woody vegetation cover in the herbaceous wetland area.
3. Presence of stable, functioning hydrologic restoration features (proof via photographic documentation).
4. Presence of less than 5 percent areal cover of invasive species in the herbaceous stratum and 1 percent or less areal cover of invasive species in the shrub and tree strata.
5. Wetland determination forms completed at each monitoring point in accordance with the USACE 1987 Wetland Delineation Manual and appropriate Regional Supplement showing that monitoring points meet the USACE definition of a wetland at or before Year 5.
6. *Riverine Forested* and *Riverine Herbaceous/Shrub* HGMi analyses and complete wetland determination datasheets within each monitoring plot to determine its current FCIs for Years 6 through 9. This information will be utilized to determine adaptive management strategies to meet Final Performance Standards (Section 9.4).
7. Financial assurances in place, in accordance with Section 13.1, 13.2, and Appendix G.

9.4 Final Performance Standards

The following standards will be measured and proof of each will be submitted to the USACE in Year 10 (to be measured in the tenth growing season following planting) or until all performance standards have been achieved, whichever is later:

1. Presence of 100 to 250 living, native trees per acre in the forested wetland areas (ideal density per HGMi).
2. Presence of no more than 10 percent woody vegetation in the herbaceous wetland area.
3. Presence of stable, functioning hydrologic restoration features (proof via photographic documentation).
4. Presence of less than 5 percent areal cover of invasive species in the herbaceous stratum and 1 percent or less areal cover of invasive species in the shrub and tree strata.
5. Financial assurances in place, in accordance with Section 13.1, 13.2, and Appendix G.
6. A wetland delineation and report in full accordance with the USACE 1987 Wetland Delineation Manual and appropriate Regional Supplement showing the extent of wetlands within the PRM Site in Year 10 and/or

final year of monitoring.

7. *Riverine Forested* and *Riverine Herbaceous/Shrub* HGMi analysis within each wetland identified in the delineation to determine FCUs within the PRM Site. The FCUs must be equal to or greater than the impacted FCUs provided in Table 2, Section 6.0. If the HGMi analysis does not meet or exceed the impacted FCUs, the Permittee and Mitigation Agent must continue to adaptively manage, maintain, and provide reports to the USACE until the PRM Site meets the required FCUs.

10.0 Monitoring Requirements

10.1 Monitoring

In Year 1, at least three vegetation monitoring stations/plots will be permanently established within the PRM Site. Each station will be 0.1 acre (radius = 37.2 feet) in size. Stations will be marked using at least an 8-foot-long PVC pipe anchored with a metal T-post at plot center and GPS coordinates will be recorded. The vegetation stations will be monitored annually during the growing season for at least 10 years or until performance standards are achieved, whichever is later. During monitoring, four photos will be taken at the center of each monitoring plot facing outward toward each cardinal direction (north, south, east, and west). Within the forested wetland areas, each planted seedling/sapling falling within each monitoring station will be geotagged and documented. Within the herbaceous wetland area, vegetation will be assessed using quadrats placed on alternating sides of a transect running in a random direction from center. The herbaceous species within each of the quadrat samples will be identified and relative percent cover will be calculated 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).

Two continuous shallow groundwater monitoring wells will be installed (one well in each WAA) to monitor hydrology of the PRM Site. They will be evaluated to collect pertinent data at least daily, including the collection of information to substantiate whether the Site exhibits appropriate hydrology for the wetland community types being restored.

10.2 Reporting Protocols

10.2.1 As-Built Report

An as-built report will be submitted to the USACE following completion of construction and initial planting work on the PRM Site and within 18 months after first Project impacts in jurisdictional areas. The as-built report will include the following:

1. A discussion of any deviations from the Mitigation Work Plan (Section 7.0).
2. A discussion of performance standards met to date.
3. Wetland determination and iHGM forms establishing baseline conditions in the PRM Site.
4. The GPS-referenced locations of monitoring plots and groundwater monitoring wells.
5. A plan view map of the constructed/restored wetlands, vegetation monitoring plots, and groundwater monitoring wells.
6. At least four photos taken from the center of vegetation monitoring plots facing north, south, east, and west.
7. Documentation of geotagged trees within each monitoring station.
8. A description regarding invasive species prevalence and composition in the sampling plots and throughout the PRM Site.

10.2.2 Yearly Monitoring Reports

Monitoring reports will be prepared in accordance with Regulatory Guidance Letter No. 08-03 and will be submitted to the USACE by December 1 of each year for a period of at least 10 years and until all performance standards are achieved, whichever is later. The Year 1 monitoring report will be measured and documented in the first growing season following planting. The monitoring reports will include data sufficient for comparison to the performance

standards described in this document as well as a discussion of all activities which took place at the PRM Site in the specified year. At a minimum, monitoring reports will also include the following:

1. A detailed narrative that summarizes the condition of the PRM Site and all maintenance activities, with specific dates and actions, which have occurred over the monitoring year.
2. Photos taken at each monitoring station facing north, south, east, and west, and any other representative photographs.
3. A written description, with accompanying raw height and diameter data, detailing the general condition of trees, including the number and species of surviving trees within each 0.1-acre monitoring plot. This description will detail any mortality that has occurred, a discussion of likely causes, and a description of any adaptive management that has taken place to address future mortality.
4. Data describing vegetative communities developing at each monitoring station, including height, diameter, and overall cover of plant species present.
5. Photographs and a description documenting the PRM Site percentage areal cover of exotic/invasive tree or shrub species as it pertains to the performance standards.
6. Detailed descriptions of actions used to suppress exotic/invasive species.
7. Percent cover of invasive species and a comparison to the measurements from the previous year.
8. Data and analysis regarding the hydroperiod, extent and depth of inundation, groundwater monitoring results, and precipitation within the area.
9. A description of any wildlife damage and actions taken to manage any nuisance wildlife/herbivores.
10. Photographic documentation detailing how hydrologic restoration features are stable, functioning, and in good working order.
11. Documentation detailing how financial assurances have been maintained.
12. A statement detailing compliance with the performance standards.
13. A wetland delineation report in full compliance with the USACE 1987 Wetland Delineation Manual and appropriate Regional Supplement and *Riverine Forested* and *Riverine Herbaceous/Shrub* HGMi analyses to document that the PRM Site is on track to meet or has met all performance standards (Year 10 at a minimum).

11.0 Long-term Management Plan

11.1 Purpose

The long-term management plan provides a framework for the management of the PRM Site in perpetuity.

11.2 Timing

The long-term management plan will go into effect upon the PRM Site meeting final performance standards and after a minimum of 10 years of monitoring.

11.3 Long-Term Steward

The Long-Term Steward will undertake the management of the PRM Site after the final success criteria are met. The Long-Term Steward will be Katy Prairie Conservancy, unless a different Long-Term Steward is appointed in accordance with the 2008 Final Rule (33 CFR § 332.7(d)(1)) and subject to a 30-day USACE review period. Site ownership or duties may be transferred, by sale, donation, appointment, or otherwise, to a public agency, non-governmental organization, or private land manager after a 30-day USACE review period. Financial assurances and/or long-term funds held in association with the PRM Site must accompany any transfer of long-term stewardship. The PRM Site will remain subject to the conservation servitude and the terms of this PRM Plan. The new Long-Term Steward must agree to and assume all responsibility for the long-term requirements of this PRM Plan and confirm by providing a signed and notarized transfer form.

11.4 Long-Term Management Objectives

The goal of long-term management is to foster the long-term viability of the PRM Site's aquatic resources. The Long-Term Steward will conduct annual inspections of the PRM Site during the growing season to determine the specific needs of the PRM Site to meet this goal. Each year, the Long-Term Steward will update a list of corrective actions recommended to protect or enhance the PRM Site's aquatic resource functions and the Long-Term Steward will utilize the annual distributions from the long-term management financial assurances account to implement items from the list. All unused funds from the distributions will be reinvested in the account to be used in subsequent years. To assist the Long-Term Steward in achieving this goal, the following is a list of objectives that will define the long-term viability:

1. The Long-Term Steward will maintain native vegetation on the PRM Site by using the best available science and current forestry practices (e.g., planting, thinning, application of pesticides, removal of destructive wildlife).
2. The Long-Term Steward will control the encroachment of invasive plant species on the PRM Site by using the best available science and practices (e.g., herbicides, manual removal, burning, chainsaw).
3. The Long-Term Steward will repair erosion and obstructions to drainage at the PRM Site utilizing appropriate natural materials to ensure the PRM Site maintains wetland conditions, as defined by the USACE.

11.5 Impacts to Permittee Responsible Mitigation Site

After restoration, wetlands within the PRM Site will be subject to all applicable requirements established under the Clean Water Act (CWA). As such, all activities requiring CWA permit approval, including deposition of dredged or fill material and mechanized land clearing, will be coordinated with the USACE.

11.6 Timber Management

Timber thinning will be performed if it enhances the ecological function of the forest. Any timber harvesting operations conducted at the PRM Site will be authorized by the USACE and would only be performed in a manner that enhances the ecological function of the forest.

12.0 Adaptive Management Plan

Wetlands are dynamic systems that are influenced by temperature, precipitation, humidity, wildlife, disease, human actions, fire, and many other factors that even with careful planning can be very difficult to predict. While the Mitigation Work Plan (Section 7.0) was designed to give the PRM Site the best chance of being restored to natural wetland conditions, it is important to recognize the potential need and allow for adaptive management actions to help the on-site habitat thrive as healthy wetlands.

In the event the PRM Site is not meeting the Performance Standards or desired ecological functions, RES, the Mitigation Agent, on behalf of the Permittee, will act to correct the issue. Situations which RES would act to correct include, but are not limited to, the following:

- *Tree counts fall below the required stems per acre (depending on Performance Standard year)* – RES would replant or plant supplemental trees to meet Performance Standard requirements. Tree species from the approved planting list would be planted to raise tree counts to meet the performance standards.
- *Hydroperiods too short or too long* – Low water crossings would be lowered or raised to allow for more water to drain off the PRM Site or to retain water on the Site for a longer period. Low water crossings, water outlets, and/or gaps in berms may also be added or removed as necessary.
- *Berm damage* – If berms and low water crossings become damaged, they would be replaced, regraded, and/or reconstructed to create/maintain hydrology. This may include expanding berms to a higher elevation or wider footprint to make them more stable.

- *Low water crossings become eroded to a point of overflow* – Low water crossings would be repaired and armored with rock or concrete to discourage future erosive flow.
- *Invasive species percent cover exceeding performance standard* – herbicide treatment would be increased in frequency and different herbicides may be tested to determine if they are more effective.
- *Failure to achieve necessary FCUs* – If the PRM Site is not on pace to achieve the necessary FCUs, the Mitigation Agent may add surficial roughness, add or remove berms, add coarse woody debris, kill excess trees to create snags, plant herbaceous or midstory layers, and/or incorporate and modify additional land, among other measures.
- *PRM design failure* – If multiple performance standards are not met or the PRM Site is not trending toward becoming healthy, native forested and herbaceous wetlands, the mitigation design will be re-evaluated, re-designed, and reconstructed in a manner that is appropriate to improve conditions and help the PRM Site meet performance standards.

RES will notify the USACE if the PRM Site is not meeting Performance Standards or desired ecological functions. Notice will include a description of remedial actions taken, an explanation for these actions, an assessment of risks, and an assessment of any adjustments that will be made to the maintenance and monitoring regime. In some circumstances, such as atypical drought or unusually high rainfall, it may be best to allow nature to take its course, particularly when desired conditions are expected to re-establish without intervention. Additionally, as new management techniques and theories develop, these may need to be integrated into the PRM Site's management strategies. An adaptive management strategy provides mechanisms by which ecological goals can be maintained while allowing flexibility in meeting those goals. These measures may include, but are not limited to, topography changes, revisions to maintenance requirements, revised monitoring requirements, and/or revised performance standards. The USACE may perform compliance visits at any time to determine whether performance standards have been satisfied.

13.0 Financial Assurances

13.1 Construction and Establishment Financial Assurances

The purpose of the construction and establishment financial assurances is to ensure sufficient funds are available for performance of the ecological restoration of the mitigation project and to provide a source of funding for maintenance of the Property until the long-term success criteria are achieved. To accomplish these goals, RES will provide a Performance Bond ("Bond"; Attachment F, Sample Performance Bond; Attachment G, Financial Assurances). The bond amount is provided in Attachment G.

The performance bond will be attached to the USACE permit approval for the Project and made a part hereof, to provide financial assurance for the performance of all obligations, covenants, terms, conditions, and agreements required of the Permittee. Specifically, the step-down or bond amortization provisions are incorporated and made a part of this PRM Plan.

The funds will be available to an independent party/obligee in the case of a deficiency associated with the PRM Site, as determined appropriate by USACE. The designated independent party will not have any legal, managerial, or financial connections to the Permittee (other than that necessary for implementing the required financial assurances for executing this PRM Plan).

13.2 Long-Term Management Funding

To ensure that funds are available to provide for perpetual management of the PRM Site, RES will fund a long-term management investment account (Attachment G). The investment account is designed to be a non-wasting endowment with earnings sufficient to fund the annual maintenance cost while accounting for inflation. The annual maintenance cost estimate is based on the labor, materials, and equipment necessary for the long-term steward to implement long-term management of the PRM Site. The long-term management investment account amount, assumed inflation rate, and assumed growth rate are provided in Attachment G.

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Long-term management is expected to begin after monitoring Year 10, which is approximately 12 years after approval of the PRM Site. Attachment G provides the projected balance at Year 0 and Year 10. The long-term management account's principal amount is intended to increase in value to keep up with inflation. A portion of the interest and earnings on the account's principal balance shall be reinvested into the account annually, as necessary, to adjust the endowment principal. Any endowment fund revenues (including earnings and interest) remaining after the endowment principal is adjusted for inflation that exceed the anticipated annual long-term management expenses shall be retained in the account and may be made available to fund expenses in following years. The entire endowment fund balance, with all accrued interest and earnings and less any authorized annual expenditures, shall be available upon transfer of the long-term steward.

Received 24 January 2022

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Attachment A
Figures

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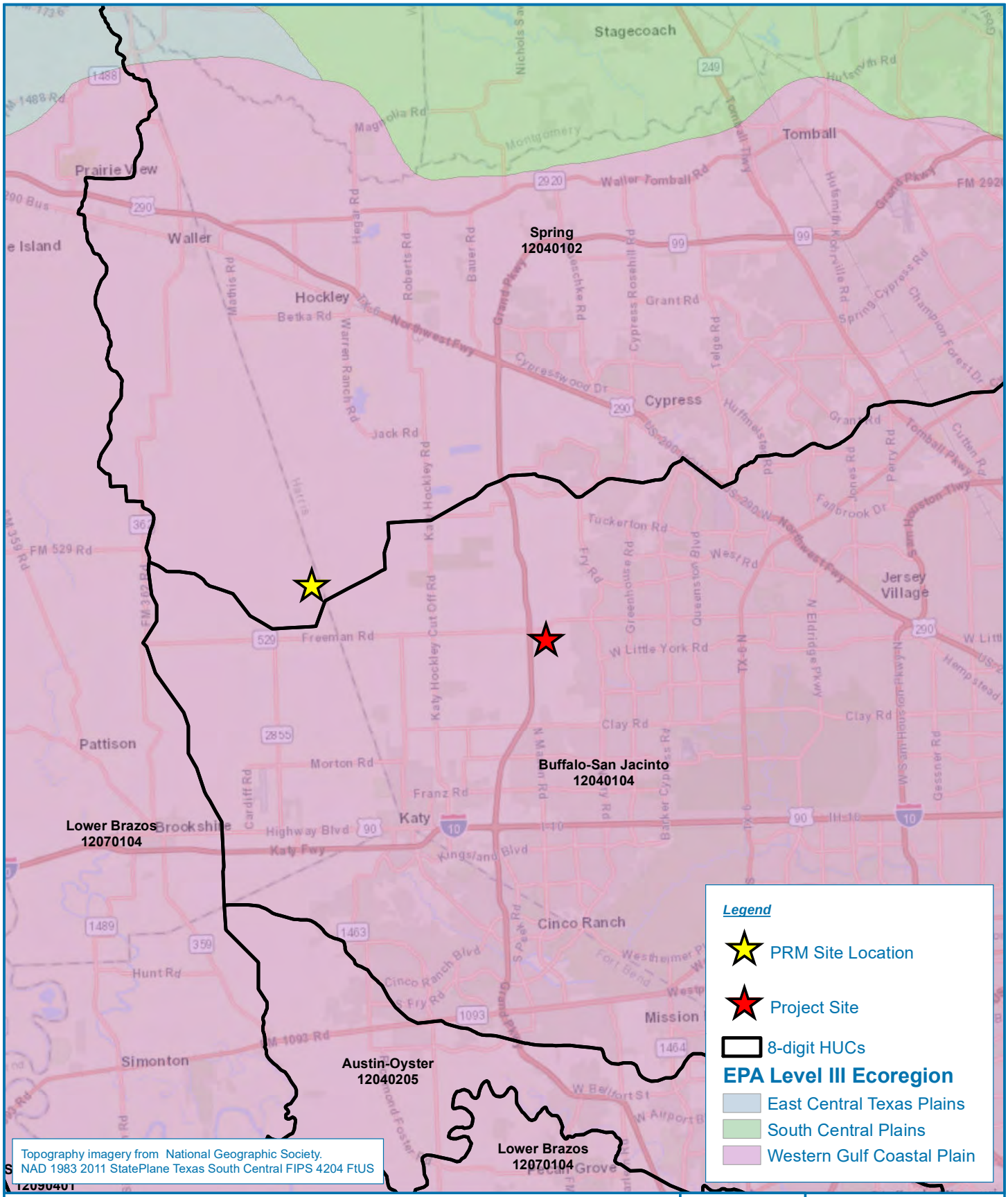

Figure 1. Vicinity

PRM for
Landmark Development Project

Waller County, Texas

Date: 12/9/2021
Drawn by: AJR
Checked by: MG

Received 24 January 2022

0 1,000 2,000
Feet

Figure 2. Topography

PRM for
Landmark Development Project

Waller County, Texas

Date: 12/14/2021
Drawn by: AJR
Checked by: MG

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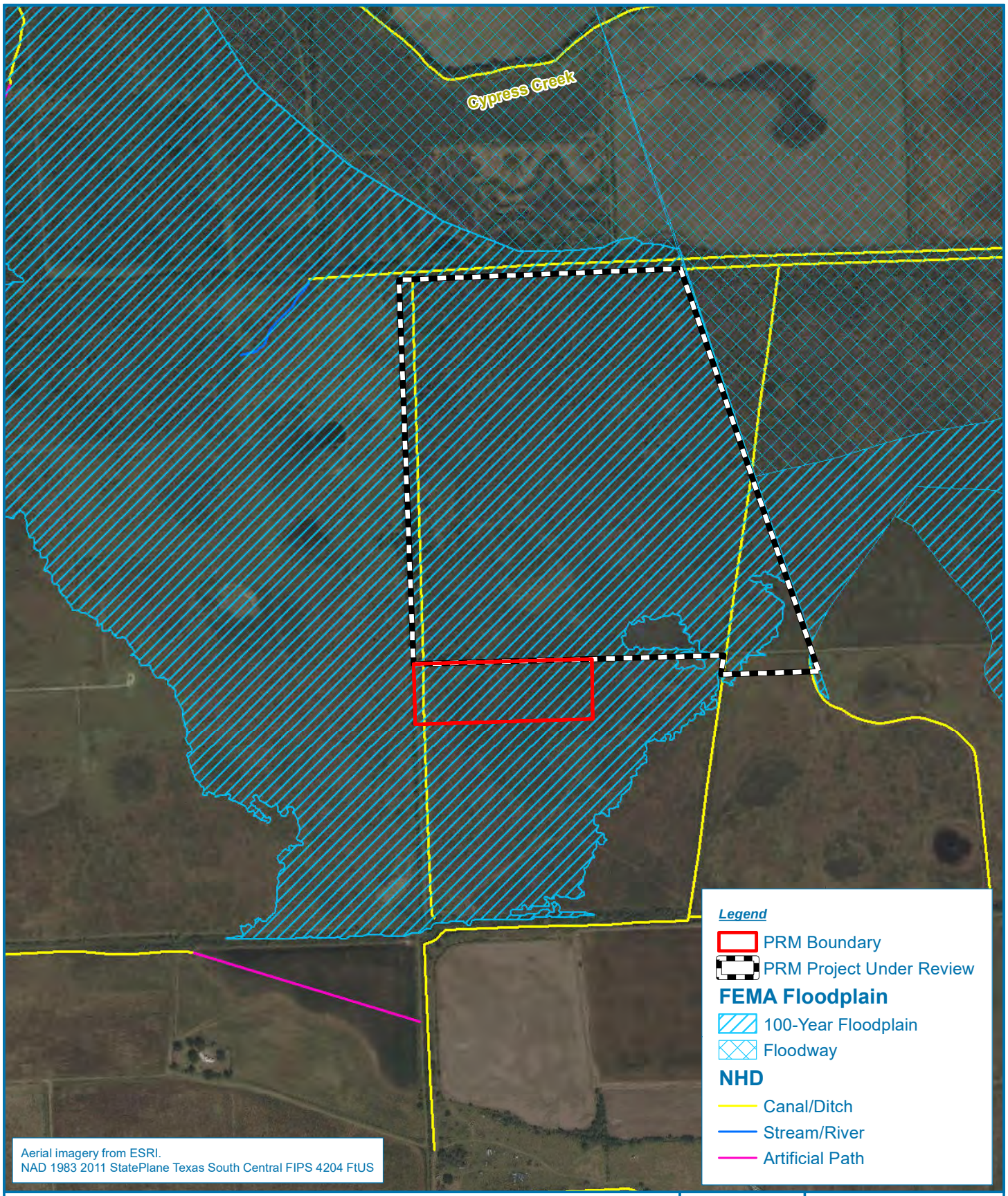

Figure 3. National Hydrography Data

PRM for
Landmark Development Project

Waller County, Texas

Date: 12/14/2021
Drawn by: AJR
Checked by: MG

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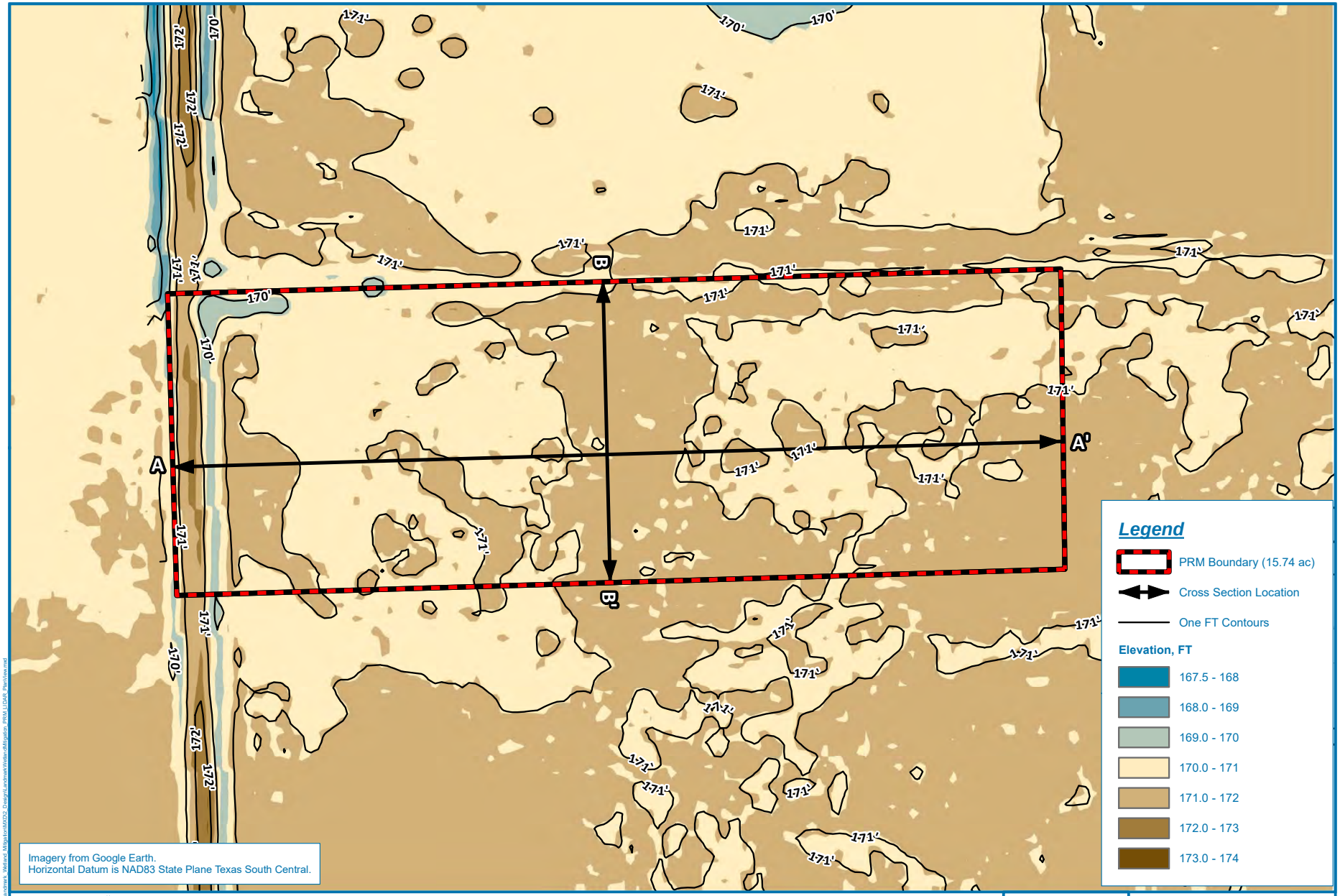


Figure 4. Mitigation Plan View Map

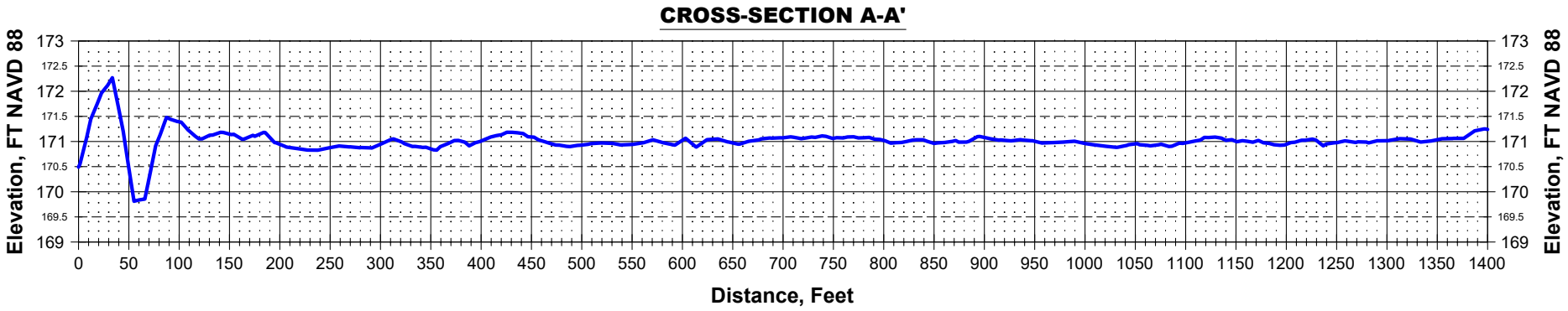
PRM for
Landmark Development Project

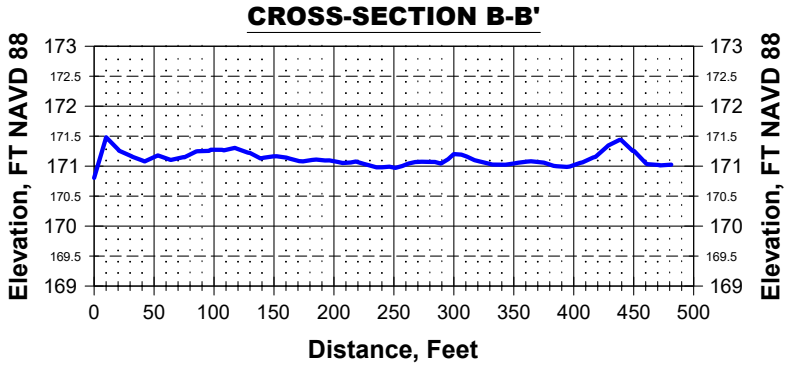
Waller County, Texas

Date: 12/14/2021
Drawn by: BL
Checked by: JC

res

Received 24 January 2022





0' 10' 20'

Horizontal Scale
Vertical Scale Is As Shown

Figure 4a. Cross-Sections A-A' & B-B'

PRM for Landmark Development Project

Waller County, Texas

Date:	09/20/2021
Drawn by:	BL
Checked by:	JC
Project No.:	103969

R:\Res\edrds\Projects\103969_Landmark_Wetland_Mitigation\CAD\Surface_CROSS_SECTIONS.dwg

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Point	Latitude	Longitude
1	29.894868	-95.874121
2	29.894872	-95.869613
3	29.89479	-95.869614
4	29.893551	-95.869633
5	29.893541	-95.874116

Figure 5. Conservation Easement Points

PRM for
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Waller County, Texas

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Figure 6. Historical Aerial - 1953

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Waller County, Texas

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Figure 7. Historical Aerial - 1978

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Waller County, Texas

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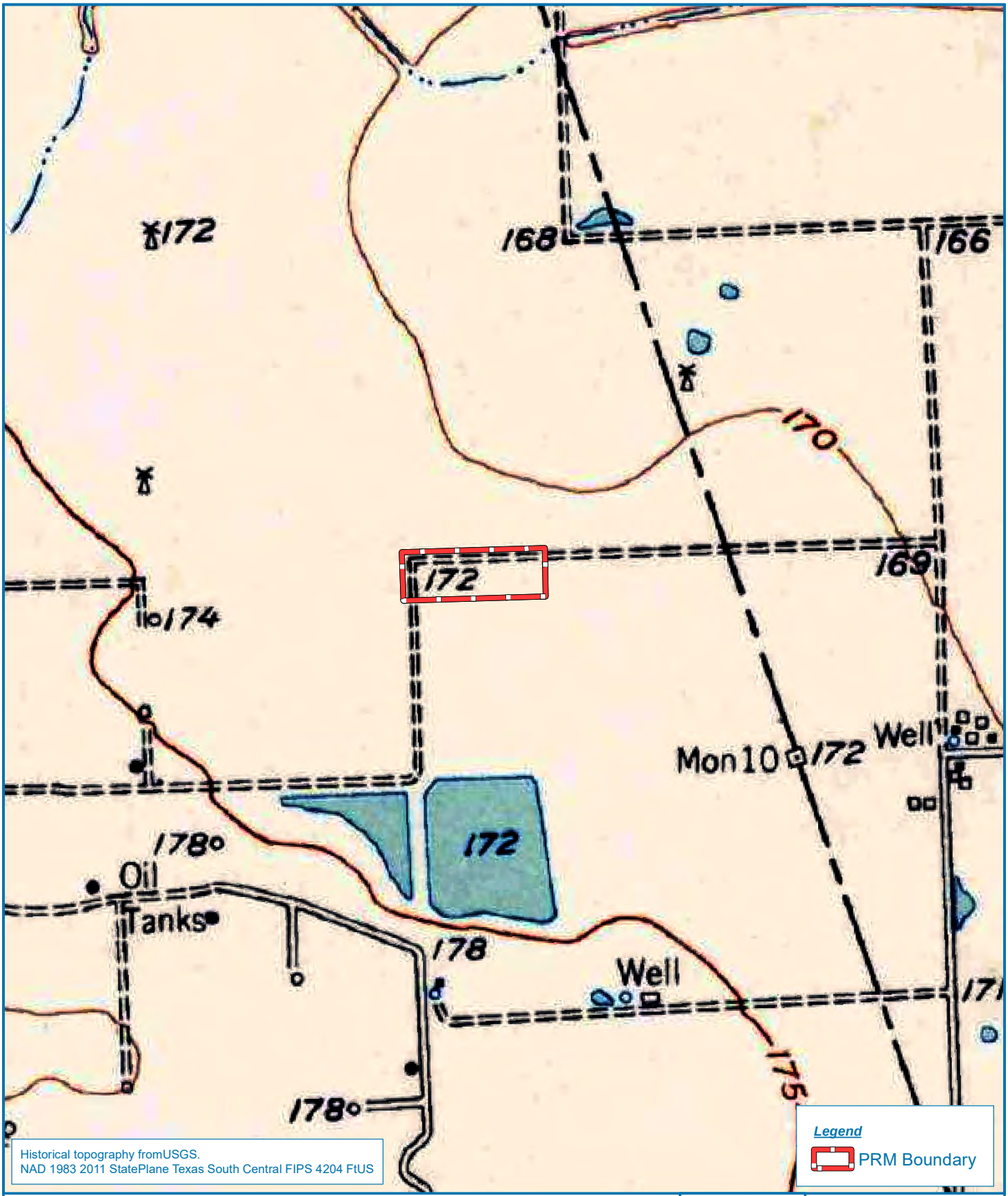

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Figure 8. Historical Topographic Map - 1955

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Landmark Development Project

Waller County, Texas

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Figure 9. Aerial Imagery - 2016

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Waller County, Texas

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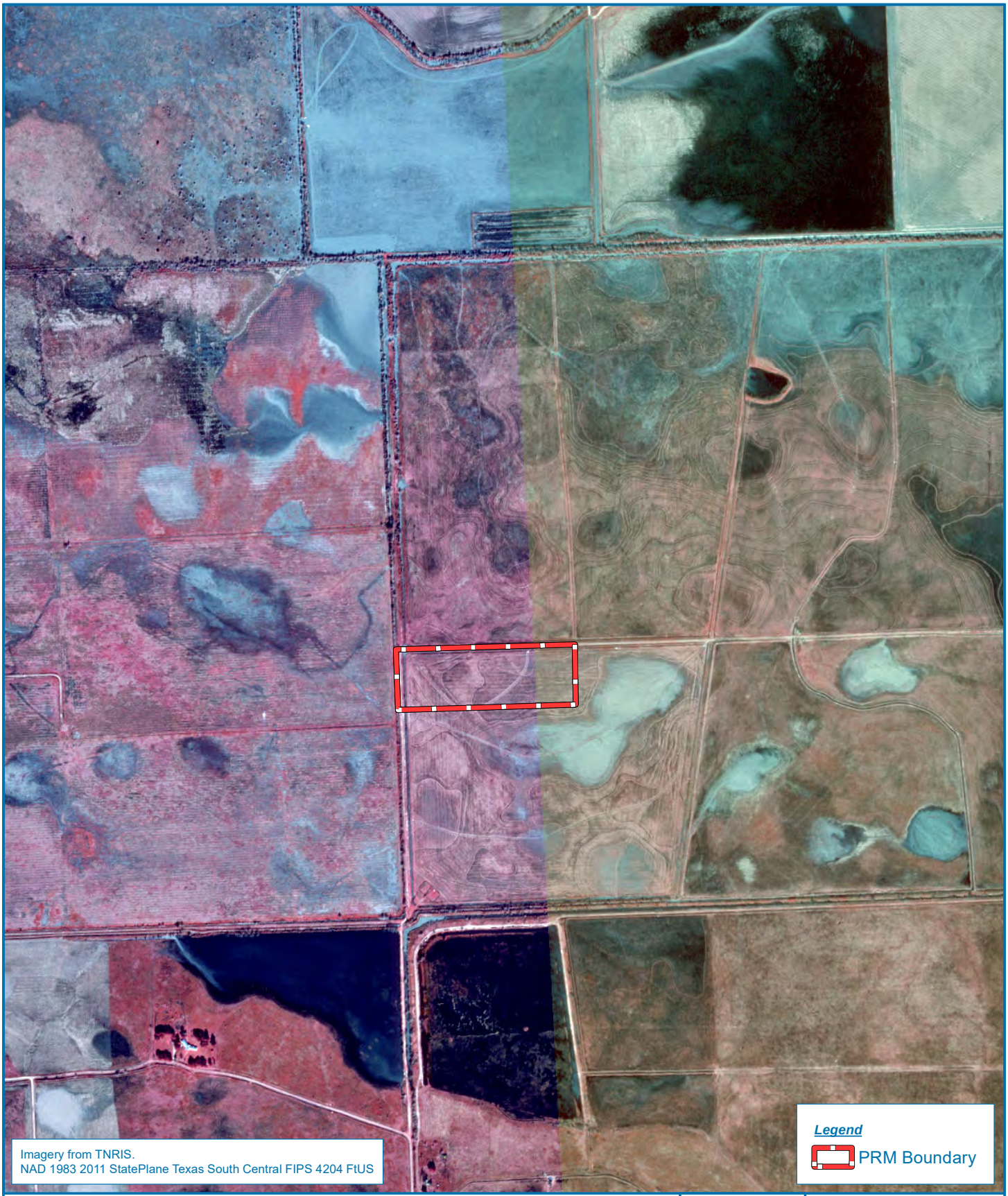

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Figure 10. Color Infrared Aerial Image - 1996

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Waller County, Texas

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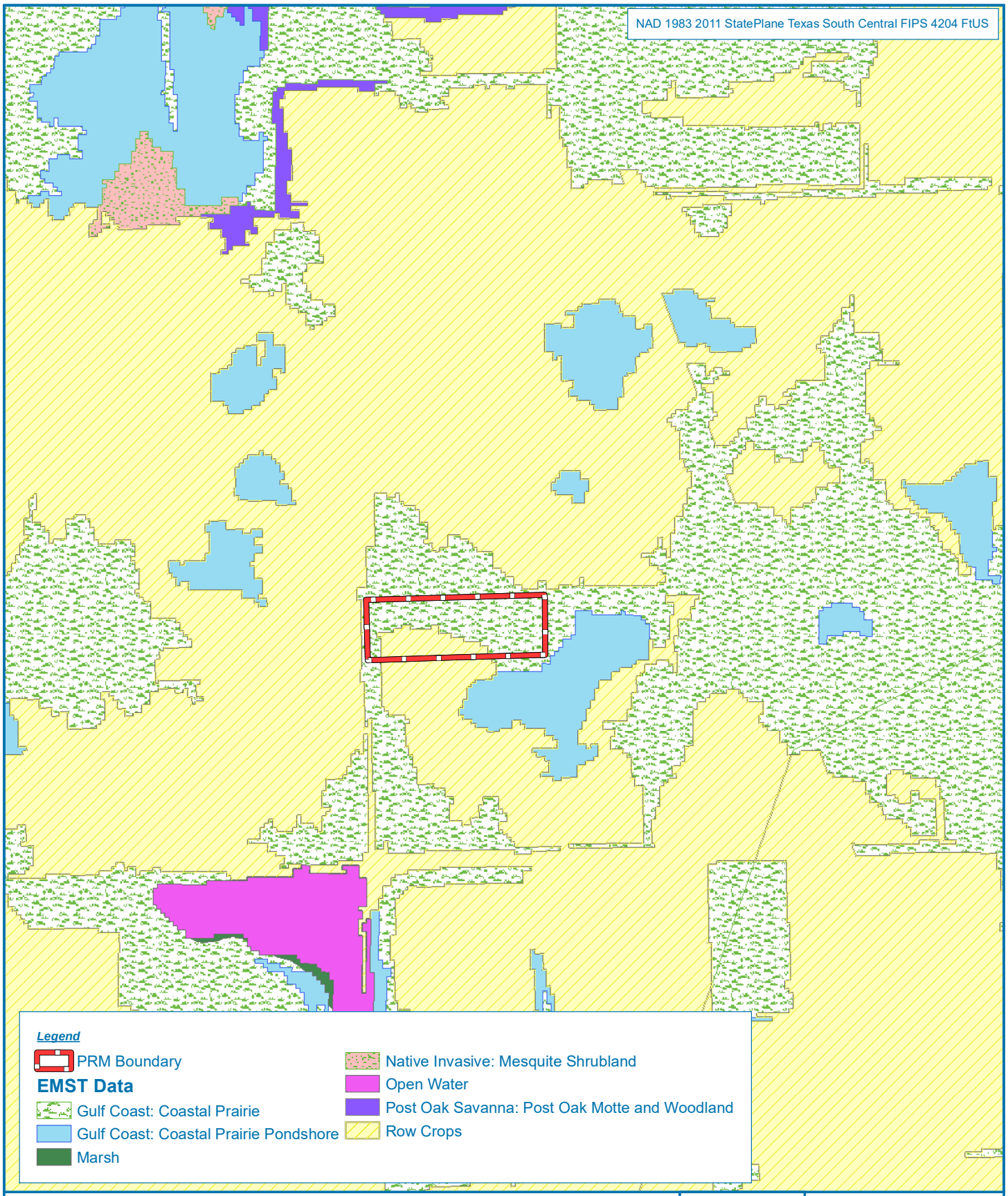

Figure 11. Ecological Mapping System of Texas

PRM for
Landmark Development Project

Waller County, Texas

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Drawn by: AJR
Checked by: MG

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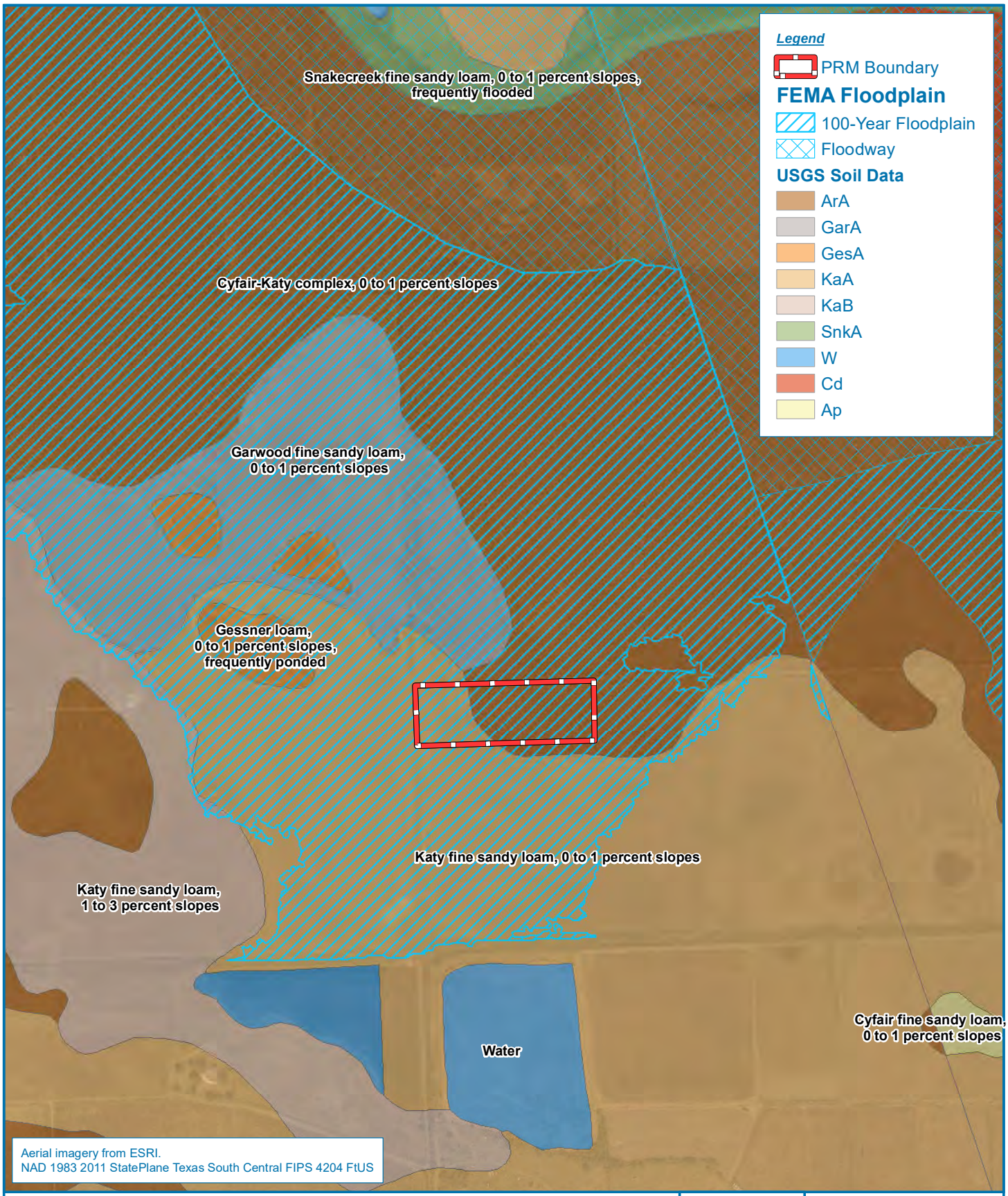

Figure 12. Soils and Floodplain

PRM for
Landmark Development Project

Waller County, Texas

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Drawn by: AJR
Checked by: MG

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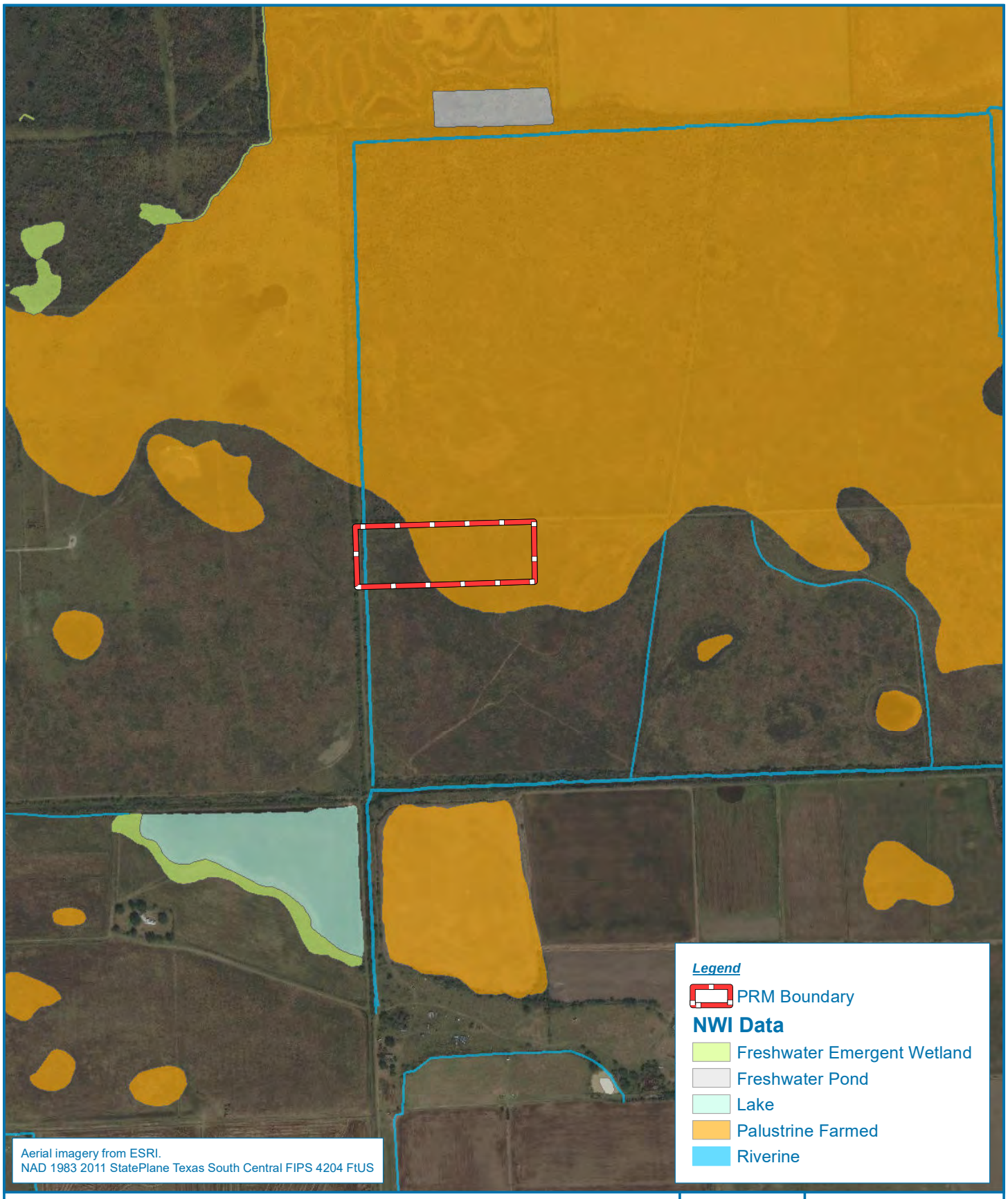

Figure 13. National Wetland Inventory

PRM for
Landmark Development Project

Waller County, Texas

Date:	12/14/2021
Drawn by:	AJR
Checked by:	MG

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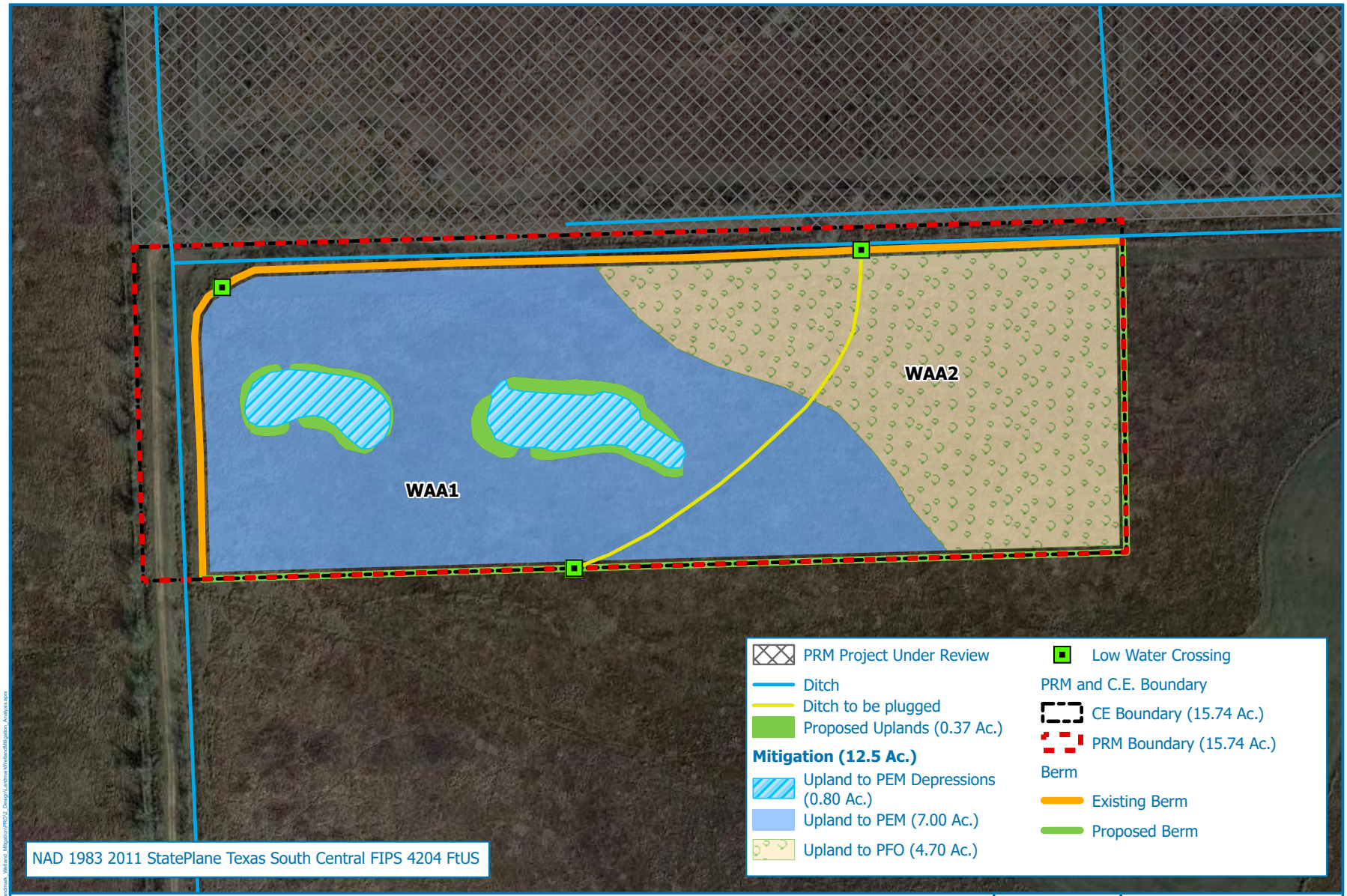

Figure 14. Mitigation Overview

PRM for
Landmark Development Project

Waller County, Texas

Date: 12/14/2021
Drawn by: JT
Checked by: JC

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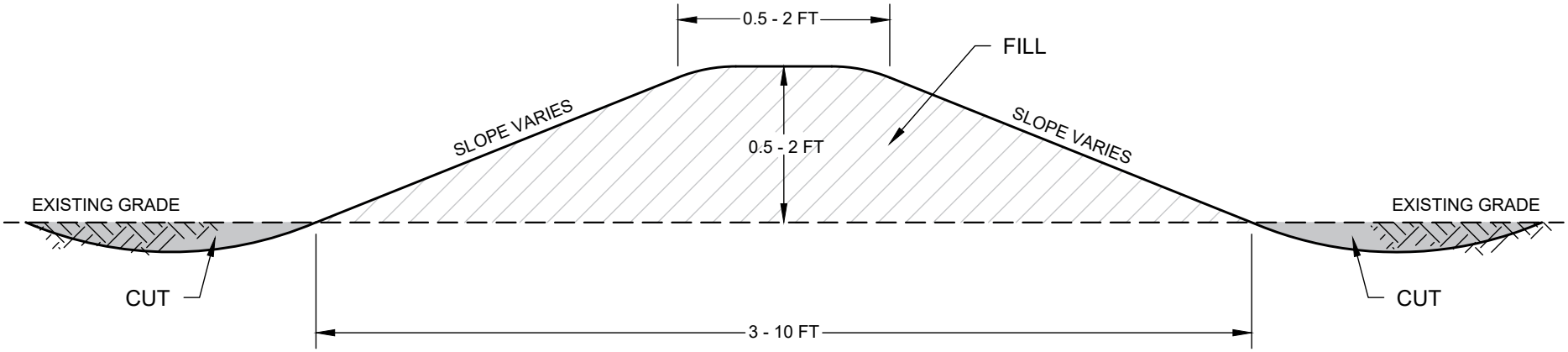

PRM SITE CROSS-SECTION OF BERM CONSTRUCTION

NOT TO SCALE
DIMENSIONS ARE APPROXIMATE

Note: Berm to be created from local material.

FIGURE 15. BERM CONSTRUCTION CROSS-SECTION
PRM FOR
LANDMARK DEVELOPMENT PROJECT
WALLER COUNTY, TEXAS

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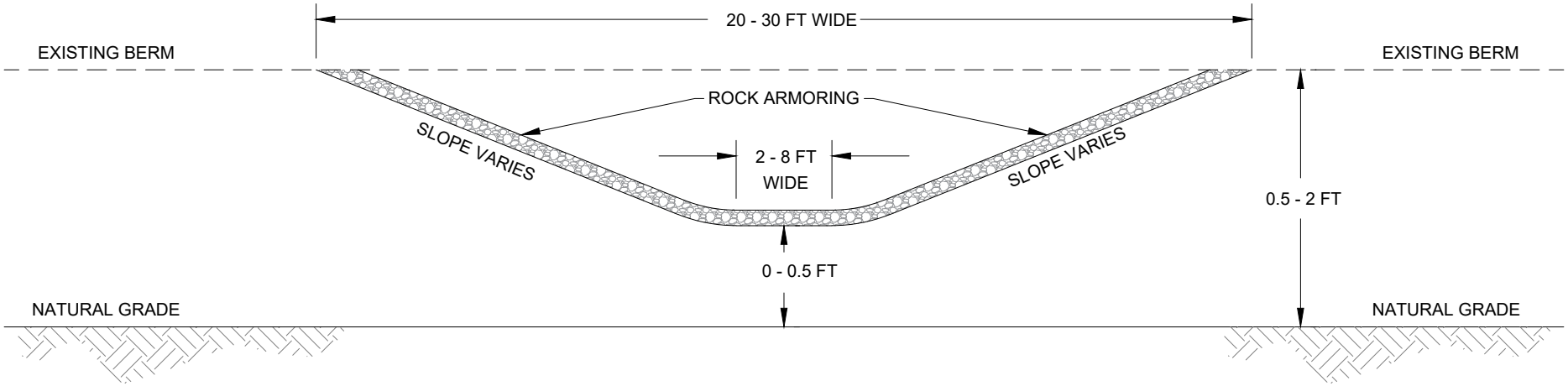

PRM SITE CROSS-SECTION LOW WATER CROSSING

NOT TO SCALE
DIMENSIONS ARE APPROXIMATE

FIGURE 16. LOW WATER CROSSING CROSS-SECTION

PRM FOR

LANDMARK DEVELOPMENT PROJECT

WALLER COUNTY, TEXAS

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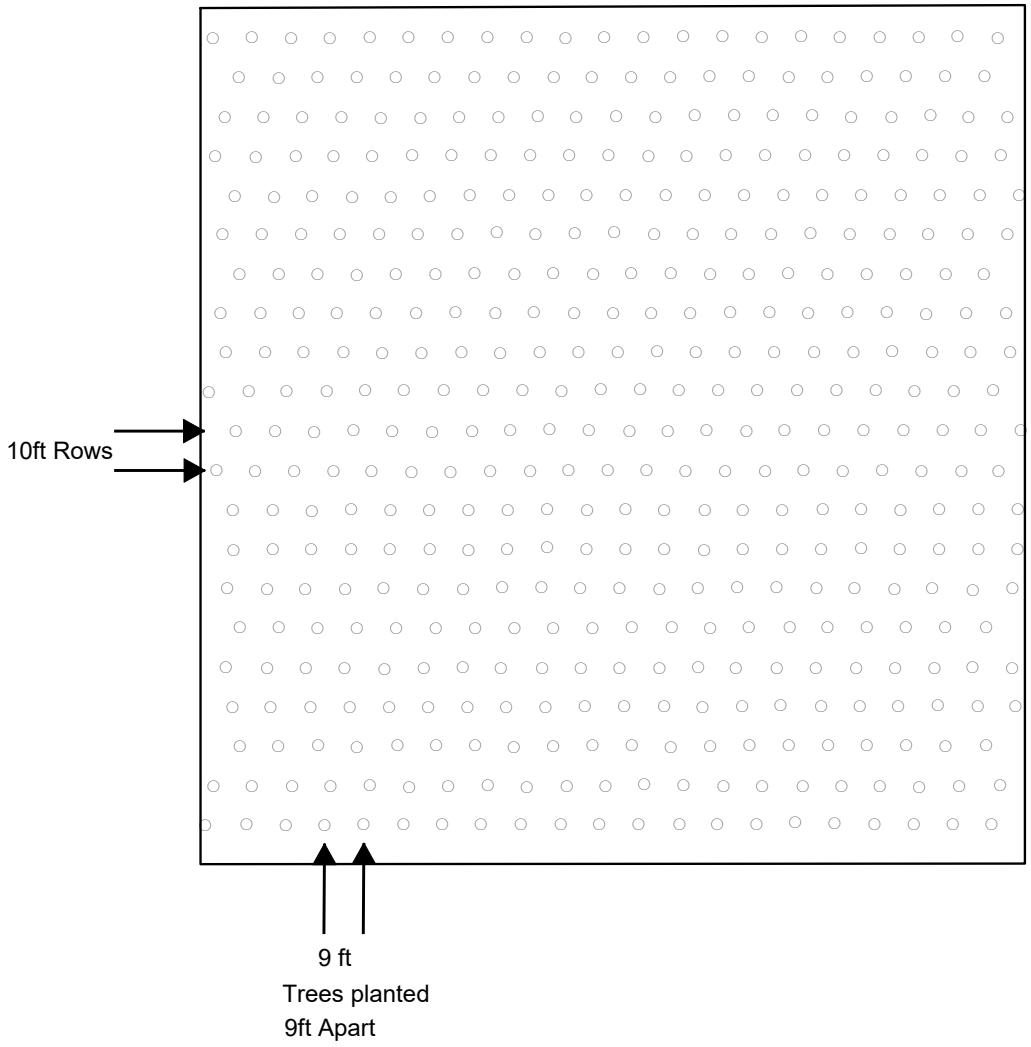

1 ACRE PLOT REPRESENTATIVE PLANTING PLAN

TREES WILL BE PLANTED ON 10FT ROWS 9FT APART IN AREAS TO BE RESTORED TO FORESTED WETLANDS

FIGURE 17. PLANTING PLAN

PRM FOR

LANDMARK DEVELOPMENT PROJECT

WALLER COUNTY, TEXAS

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Attachment B
HGMi Tables

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Landmark Tract – PEM, PSS, PUBx

Wet ID	Wetland Type	Area (Ac)	Physical FCU	Biological FCU	Chemical FCU	Total FCU
W-7	PEM	0.27	0.10	0.14	0.11	0.35
W-8	PEM	0.54	0.18	0.29	0.19	0.66
W-9	PUBx	1.91	0.55	0.80	0.73	2.08
W-10	PEM	1.8	0.61	0.81	0.70	2.12
W-17	PEM	0.14	0.05	0.10	0.04	0.19
W-18	PSS	0.06	0.02	0.05	0.02	0.08
W-19	PEM	0.86	0.29	0.57	0.34	1.20
W-20	PEM	0.4	0.16	0.21	0.16	0.54
W-21	PEM	0.82	0.28	0.48	0.32	1.08
	Total	**6.8**	2.24	3.45	2.62	**8.3**

PEM, PSS, PUBx Summary

Landmark Tract	Acres	Physical	Biological	Chemical	Total
All non-PFO wetlands	6.8	2.26	3.45	2.62	8.3

Landmark Tract - PFO1

Wet ID	Wetland Type	Area (Ac)	Physical FCU	Biological FCU	Chemical FCU	Total FCU
W-5	PFO1	0.07	0.03	0.04	0.03	0.09
W-6	PFO1	0.82	0.33	0.50	0.38	1.21
W-14	PFO1	0.4	0.16	0.22	0.18	0.56
W-15	PFO1	0.06	0.02	0.03	0.02	0.08
W-16	PFO1	2.46	0.98	1.46	1.10	3.53
	Total	3.81	1.52	2.25	1.71	5.47

PFO Summary

Landmark Tract	Acres	Physical	Biological	Chemical	Total
All PFO wetlands	3.81	1.52	2.25	1.71	5.47

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Riverine Herb/Shrub HGM (Interim) Worksheet for Projecting PRM Scores Upland to Herbaceous Wetland

Pre-project

Variable	Subindex
V_{dur}	0
V_{freq}	0
V_{topo}	0
V_{wood}	0
V_{mid}	0
V_{herb}	0
$V_{detritus}$	0
V_{redox}	0
V_{sorpt}	0
$V_{connect}$	0

Post Project

Variable	Subindex
V_{dur}	0.75
V_{freq}	0.5
V_{topo}	0.7
V_{wood}	0.25
V_{mid}	0.25
V_{herb}	1
$V_{detritus}$	1
V_{redox}	1
V_{sorpt}	0.5
$V_{connect}$	0.75

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Riverine Herb/Shrub (Interim HGM) Worksheet
Functional Capacity Index (FCI) for PRM Site
Upland to Herbaceous Wetland

Temporary Storage & Detention of Storage Water:

$[\{V_{dur} \times V_{freq}\}1/2 \times \{V_{topo} + \{V_{herb} + V_{mid}/2\}\}/2]\ 1/2$

[{ 0 x 0 } 1/2 x { 0 + { 0 + 0 /2} /2] 1/2 = FCI

[{ 0.75 x 0.5 } 1/2 x { 0.7 + { 1 + 0.25 /2} /2] 1/2 = FCI

Maintain Plant and Animal Communities:

$\{V_{mid} + V_{herb} + V_{connect}\}/3$

{ 0 + 0 + 0 } /3 = FCI

{ 0.25 + 1 + 0.75 } /3 = FCI

Removal & Sequestration of Elements and Compounds:

$[[V_{wood} + V_{freq} + V_{dur} + [\{V_{topo} + V_{herb} + V_{mid}\}/3] + [\{V_{detritus} + V_{redox} + V_{sorpt}\}/3]]/5$

[[0 + 0 + 0 +[{ 0 + 0 + 0 }/3] + [{ 0 + 0 + 0 }/3]] /5 = FCI

[[0.25 + 0.5 + 0.75 +[{ 0.7 + 1 + 0.25 }/3] + [{ 1 + 1 + 0.5 }/3]] /5 = FCI

Functional Capacity Units (FCU); FCI x wetland acres per WAA…

Acres: 7.8

WAA # **0**	Pre-project FCUs	Post Project FCUs
Temp Storage of Water	0.00	4.97
Maintain Plant & Animal	0.00	5.20
Removal of Elements	0.00	4.65

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Riverine Forested HGM Interim Worksheet for Projecting PRM Scores Upland to Forested Wetland

Pre-project

Upland

Variable	Subindex
V_{dur}	0
V_{freq}	0
V_{topo}	0
V_{cwd}	0
V_{wood}	0
V_{tree}	0
V_{rich}	0
V_{basal}	0
$V_{density}$	0
V_{mid}	0
V_{herb}	0
$V_{detritus}$	0
V_{redox}	0
V_{sorpt}	0
$V_{connect}$	0

Post Project

Forested

Variable	Subindex
V_{dur}	0.75
V_{freq}	0.5
V_{topo}	0.4
V_{cwd}	0.5
V_{wood}	1
V_{tree}	1
V_{rich}	1
V_{basal}	0.4
$V_{density}$	1
V_{mid}	0.5
V_{herb}	0.3
$V_{detritus}$	1
V_{redox}	1
V_{sorpt}	0.5
$V_{connect}$	0.75

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Riverine Forested (Interim) HGM Worksheet
Functional Capacity Index (FCI) for PRM Site
Upland to Forested Wetland

Temporary Storage & Detention of Storage Water:

$$\sqrt{\left[\sqrt{(V_{dur} * V_{freq})} * \frac{(V_{topo} + V_{cwd} + V_{wood})}{3}\right]}$$

[{ 0 x 0 } 1/2 x { 0 + 0 + 0 } /3] 1/2 = FCI

[{ 0.75 x 0.5 } 1/2 x { 0.4 + 0.5 + 1 } /3] 1/2 = FCI

Maintain Plant and Animal Communities:

$$\frac{\left[V_{tree} + V_{cwd} + V_{rich} + \frac{[V_{basal} + V_{density}]}{2} + \left[\frac{(V_{mid} + V_{herb})}{2}\right] + V_{connect}\right]}{6}$$

[0 + 0 + 0 +[{ 0 + 0 } /2]+[{ 0 + 0 }/2]+ 0]/6 = FCI

[1 + 0.5 + 1 +[{ 0.4 + 1 } /2]+[{ 0.5 + 0.3 }/2]+ 0.75]/6 = FCI

Removal & Sequestration of Elements and Compounds:

$$\frac{\left[V_{wood} + V_{freq} + V_{dur} + \left[\frac{(V_{topo} + V_{cwd} + V_{wood})}{3}\right] + \left[\frac{(V_{\text{det ritus}} + V_{redox} + V_{sorpt})}{3}\right]\right]}{5}$$

[0 + 0 + 0 +[{ 0 + 0 + 0 }/3] + [{ 0 + 0 + 0 }/3] /5 = FCI

[1 + 0.5 + 0.75 +[{ 0.4 + 0.5 + 1 }/3] + [{ 1 + 1 + 0.5 }/3] /5 = FCI

Functional Capacity Units (FCU); FCI x wetland acres per WAA…

Acres: 4.7

WAA # **Upland**	Pre-project FCUs	Post Project FCUs
Temp Storage of Water	0.00	2.93
Maintain Plant & Animal	0.00	3.41
Removal of Elements	0.00	3.49

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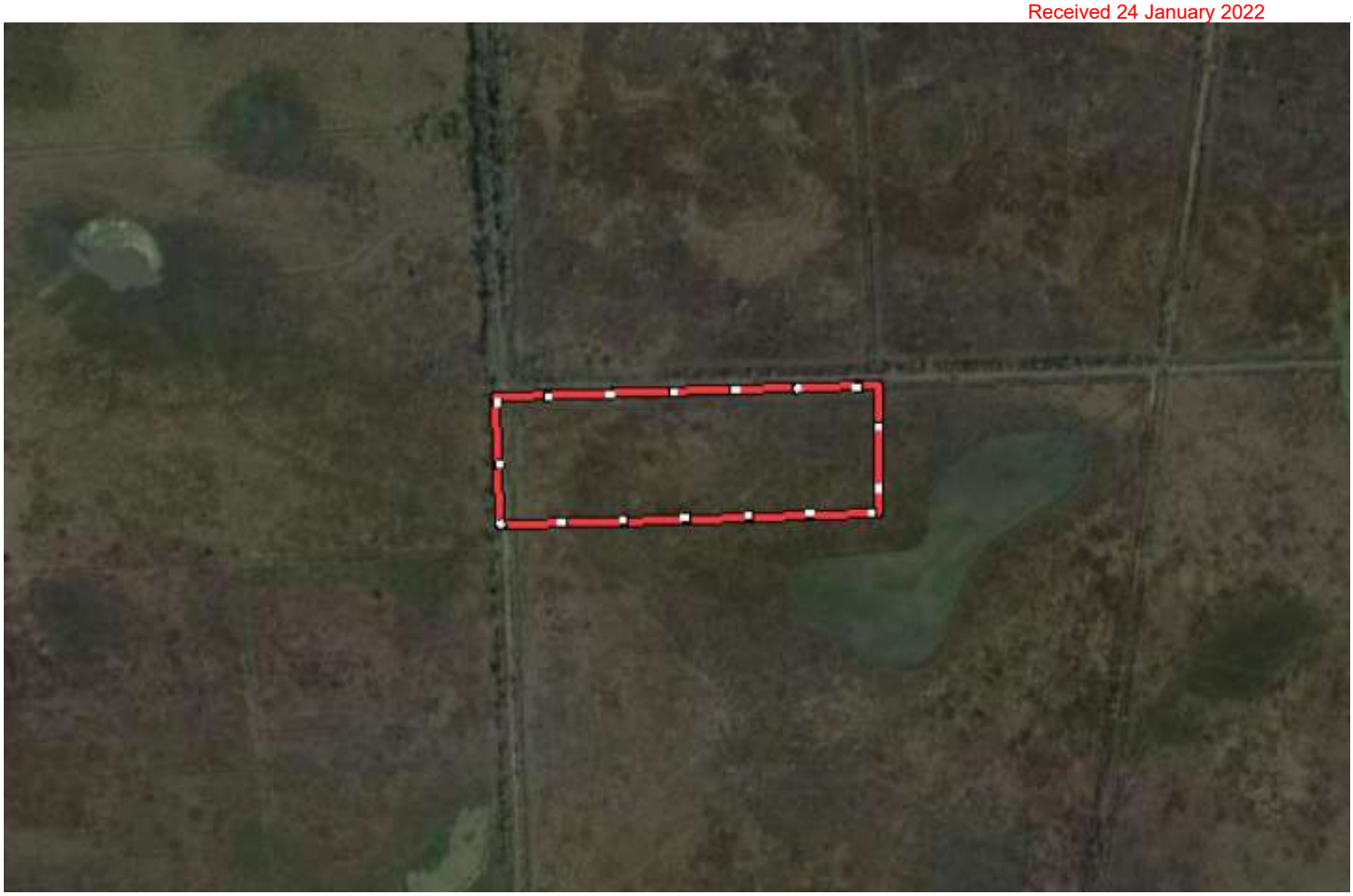

Water Budget

PRM for Landmark Development Project

Waller County, Texas
SWG-2019-00234 | December 15, 2021

Prepared for USACE, Galveston District
Prepared by Resource Environmental Solutions
On Behalf of Landmark Industries, LLC

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Received 24 January 2022

1.0 Introduction

Resource Environmental Solutions (RES) is presenting this Water Budget on behalf of Landmark Industries, LLC (Permittee) and BGE, Inc. (Agent) for the proposed construction of the Landmark Development Project (Project), U.S. Army Corps of Engineers (USACE) Permit Number SWG-2019-00234, located in Harris County, Texas. This water budget describes the volume of water expected to be available at the Permittee-Responsible Mitigation (PRM) Site for proposed wetland restoration.

Implementation of the PRM Plan will:

1) re-establish and sustain wetland functions to 7.8 acres of existing upland pasture as herbaceous and prairie depressional wetland; and
2) establish and sustain wetland functions to 4.7 acres of existing upland pasture as forested wetland.

2.0 Baseline Information

Characteristics of the PRM Site are described in the PRM Plan. A brief summary is provided below.

The proposed Project is located in Harris County and the PRM for the Landmark Development Project is located in Waller County near its boundary with Harris County. The PRM Site is approximately 7 miles west of the proposed Project, between the cities of Katy and Waller. The approximate center of the PRM Site is located within the geographic limits of the United States Geological Survey (USGS) 7.5-minute quadrangle "Warren Lake" at coordinates 29.893889° north latitude and 95.871111° west longitude.

Waller County has relatively flat grasslands in the south and gently rolling post oak savannahs in the north with high levels of conversion to agricultural land use and urban and industrial uses, including oil and gas production. The average temperature of Waller County is 68.3°F, average annual precipitation is 41.16 inches, and average humidity is 72.82 percent (World Media Group 2021). The slope in this region is usually less than 1 percent across the landscape and, according to recent LIDAR data, the elevations across the PRM Site are 165 to 171 feet above mean sea level. The majority of the PRM Site is within the Federal Emergency Management Agency (FEMA) 100-year floodplain of Cypress Creek.

The PRM Site is within the Spring watershed (HUC 12040102). Precipitation sheet flow moves across the PRM Site towards Cypress Creek. Cypress Creek flows east through agricultural lands and residential and commercial development to Spring Creek, reaching Lake Houston and then Trinity Bay.

Based on the earliest available aerial imagery, the PRM Site was cleared for rice farming by the 1940s. Also at this time, a part of Cypress Creek and its tributary that runs near the PRM Site began to be channelized. Based on historical information, this area was most likely coastal prairie with forested areas along Cypress Creek and its floodplain. Since the 1940s when it was first converted, the PRM Site has remained agricultural land and pastureland.

The Mitigation Work Plan is described in Section 7.0 of the PRM Plan. It will include:

- degrading a ditch that drains the PRM Site;
- creating berms to slow water flow over the PRM Site;
- installing low water crossings
- creating prairie wetland depressions;
- adding microtopography and surface roughness; and
- planting and/or seeding native species to restore the plant community.

2.1 Soils

Two main soil types are mapped within the PRM Site: Cyfair-Katy complex, 0 to 1 percent slopes (ArA), and Katy fine sandy loam, 0 to 1 percent slopes (KaA). These soil series are formed in loamy fluviomarine deposits derived from the Lissie Formation of the Pleistocene age. As a soil derived from fluviomarine deposits in flats of the coastal prairie, it is moderately to somewhat poorly drained and often demonstrates redoximorphic features. Both soil series occur on the NRCS Hydric Soil List (NRCS 2021a), which indicates that at least a portion of each soil series is likely to meet the NRCS hydric soil definition.

- Cyfair-Katy complex soils consist of loamy fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock from the late Pleistocene. The soils are somewhat poorly drained and have slow permeability with high runoff. This soil complex can be found in flats of coastal plains and may become saturated or inundated during January through April.
- Katy fine sandy loam soils consist of loamy fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock from the late Pleistocene. The soils are moderately well drained and have moderately slow permeability with low runoff. This soil can be found in flats of coastal plains and its seasonal water table occurs due to episaturation for short periods during the cool months or in periods of excess rainfall.

The soils observed within the PRM Site consist of silty loam to sandy loam soils. The presence of these moderately drained soils in conjunction with precipitation and sheet flow provide sufficient hydrology for hydric soil formation throughout the PRM Site..

2.2 Hydrology

The PRM Site is primarily influenced by direct precipitation with periodic flooding from Cypress Creek and its tributaries, which results in intermittent periods of prolonged saturation. Historically, the PRM Site would have received significant volumes of water via overland flow from upslope properties after rain events, which would have created significantly longer hydroperiods. When the property was used for rice farming, depressions were filled and ditches were excavated to allow rapid drainage during wet periods and for dewatering the field prior to rice harvest. This diversion of overland flow and the absence of active water transfer associated with rice farming has likely caused significantly drier conditions on the PRM Site than ever before.

The secondary source of hydrology will be periodic overbank flooding from Cypress Creek and associated tributaries, resulting in intermittent periods of prolonged saturation. Overbank flooding is expected to continue in the future at least 2 out of 5 years. This Water Budget models dry, average, and wet years, so the predicted hydrology on the Site in an average or dry year will not

include a flooding event that occurs 2 out of 5 years. In addition, to more conservatively estimate hydrology in a wet year, this Water Budget does not include overbank flooding. The PRM Site is designed to detain minimal surface hydrology when overbank flooding occurs. Water will be allowed to run off the PRM Site and cause no more inundation than the rainfall which spurred the flooding. While overbank flooding is expected to result in the performance of numerous chemical, biological, and physical functions at the PRM Site, it is expected to have little effect on the duration of inundation and saturation at the PRM Site in an average year, as is modeled in the Water Budget.

The majority of the PRM Site is located within the FEMA 100-year floodplain of Cypress Creek. This floodplain connects to the upper 100-year floodplains of Bear and South Mayde creeks, forming the Addicks/Barker overflow zone, a critical floodwater attenuation zone servicing the Buffalo-San Jacinto watershed.

National Wetland Inventory (NWI) mapping shows roughly 70 percent of the PRM Site includes palustrine farmed wetlands.

3.0 Water Budget Analysis

The overall Water Budget equation used in this study takes both water inflows and outflows into account as follows:

$$\Delta Storage = [P + SW_i + G_i] - [ET + SW_o + G_o]$$

Where,

$\Delta Storage$ = change in volume of water storage in a wetland (acre-in)
P = precipitation runoff, also called surface water runoff (acre-in)
SW_i = surface water inflow (acre-in)
G_i = groundwater inflow (acre-in)
ET = evapotranspiration (acre-in)
SW_o = surface water outflow (acre-in)
G_o = groundwater outflow (acre-in)

The following sections describe the analyses of various data and the methods used to develop the water budget analysis using the above equation.

3.1 Surface Water Runoff

Runoff is typically estimated using the Runoff Curve Number (RCN) Method developed by the NRCS and is described in Chapter 10 of the National Engineering Handbook – Part 630, Hydrology (NRCS 2004). The equation estimates total storm runoff from total storm rainfall while excluding time and rainfall intensity as variables.

The RCN Method equation for determining surface water runoff is:

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

Where,

Q = runoff (in)
P = precipitation in the form of rainfall (in)
S = potential maximum retention after runoff begins (in)
I_a = initial abstraction (in)

Initial abstraction consists of interception, infiltration, and surface depression storage during early parts of the storm (NRCS 2004). I_a was found by the NRCS to be approximated by the following empirical equation:

$$I_a = 0.2S$$

Although not adopted by the NRCS, multiple studies have determined that a ratio of I_a/S equal to 0.05 is much more representative of actual events (Hawkins et al. 2002). Based on the low infiltration rates of the PRM Site soils an I_a/S ratio of 0.05 was considered more appropriate. As a result, the initial abstraction equation becomes:

$$I_a = 0.05S$$

By removing I_a as an independent parameter, the RCN Method Equation can be reduced to the following equation, using only two independent variables, P and S:

$$Q = \frac{(P - 0.5S)^2}{(P + 0.95S)}$$

This equation is valid where the precipitation, P, in inches, exceeds the maximum potential retention, S, in inches. Until this condition is reached, all precipitation will be lost from the runoff equation as infiltration and other initial abstractions. The minimum precipitation, P, required to achieve measurable runoff, Q, is unique to each site and is governed by the site's S and curve number values.

The potential maximum retention after runoff begins, S, is related to the soil and cover conditions of the watershed through the curve number (CN). CN has a range of 0 to 100, and S is related to CN as:

$$S = \frac{1000}{CN} - 10$$

3.1.1 Watershed

For this project, the watershed includes the pasture areas located to the south of the PRM Site. Based on topography of the area, approximately 90 acres are expected to drain into the PRM Site. Approved Jurisdictional Determination shows that approximately 28 acres of this watershed are existing wetlands.

3.1.2 Curve Numbers

Curve numbers are empirically derived values based on hydrologic soil groups and land use and are provided by NRCS's TR-55 document (NRCS 1986). For the PRM Site, a CN of 74 was selected for the watershed, based on the existing cover of "Pasture/Range, no mechanical treatment – Hydrologic Condition: Good" and hydric soil group C.

The initial abstraction (S, as described above) has been modified from what is given by NRCS TR-55 in order to produce more reliable results under smaller rainfall events. Initial abstraction has been reduced from 0.20 to 0.05 to produce more runoff during small rain events. Converting the curve number from 0.20 S to 0.05 S gives a curve number of 64.

3.2 Precipitation

The National Oceanographic and Atmospheric Administration (NOAA) maintains historical climatological data in the U.S. through the Global Historical Climatology Network (GHCN). A combination of two nearby stations provides a record of precipitation from 1960 to 2019. The Katy City, TX station (GHCND: USC00414704) located approximately 8 miles south of the PRM Site and Cypress, TX station (GHCND: USC00412206) located approximately 12 miles northeast of the PRM Site were selected as the sources for precipitation data in this analysis. Based on these data, the driest year in 1988 had 22.52 inches. The year with the closest to average rainfall per year is 1985 with 45.00 inches. The wettest year in this dataset is 2004, with 73.56 inches of precipitation. Monthly precipitation totals from these years are provided below:

Table 1. Monthly and Annual Precipitation (inches) for driest, average, and wettest years at Katy City, TX and Cypress, TX stations.

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
1988 (Driest)	1.14	0.83	3.67	1.86	0.63	1.43	3.98	2.92	1.78	0.00	1.22	3.06	22.52
1985(Average)	2.48	4.96	4.65	2.33	0.55	4.58	3.93	1.43	2.30	6.54	7.12	4.13	45.00
2004 (Wettest)	6.54	5.02	2.97	8.01	12.95	13.13	1.25	2.74	1.10	3.38	14.55	1.92	73.56

3.3 Stream Overbank Flows, Groundwater, and Surface Water

Overbank flows from Cypress Creek into the PRM Site are expected to occur infrequently (2 out of 5 years), and as a conservative estimate are not included as a water source in this Water Budget. Low water crossings will control water outflow and limit the maximum water depth within the PRM Site up to 6 inches, which is accounted for in the hydrologic model. The hydrologic model includes an input for average water depth under flooded conditions to account for the maximum water volume, and a depth of 4 inches (on average) in the wetland areas is used.

The PRM Site soils have low to moderately low permeability and therefore, a rate of 0.000001 cm/sec is used in the hydrologic model.

3.4 Evapotranspiration

Evapotranspiration (ET) is taken from Texas A&M AgriLife Extension (https://texaset.tamu.edu/), using the Houston monthly values (Table 2).

Table 2. Monthly evapotranspiration at Houston, TX, in inches.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2.36	2.83	4.32	5.01	6.11	6.57	6.52	6.08	5.57	4.28	2.90	2.35

3.5 Water Balance

Based on the assumptions described above, groundwater inflow was removed from the water budget equation. Therefore, the water budget can be simplified as:

$$\Delta Storage = [P + SW_i] - [ET + SW_o + G_o]$$

Where,

$\Delta Storage$ = Change in volume of water storage in a defined area over time (acre-in)
P = Runoff from precipitation (acre-in)
SW_i = Stormwater inflows from offsite drainage areas (acre-in)
ET = Evapotranspiration (acre-in)
SW_o = Stormwater outflows to Cypress Creek (acre-in)
Go = groundwater outflow (acre-in)

For this model, the volume of water stored on the PRM Site was converted to depths by dividing the volume by the acreage of the Site. The graphs below demonstrate the depth of water stored in the wetland from a daily time step model of this formula under the driest, average, and wettest year. A horizontal line indicates the volume of water stored in the soil, any additional water would constitute standing water, a depth at this level would indicate saturated soils. Each graph indicates saturated conditions for at least 2 weeks during the growing season. Data used in the model and summary tables are attached.

3.6 Model Limitations

This water budget models the PRM Site's predicted hydrology and its duration, including inundation and saturation, in an average year using precipitation data from NOAA's GHCN stations. Although the PRM Site receives overbank flooding from Cypress Creek, the model is limited to only precipitation data. There is no climatic source or reliable, scientific data on how frequently overbank flooding occurs, how deep it gets, or the duration of flooding at a specific location; therefore, any inputs of such data would have to be fabricated based on assumptions, which would

affect the validity of the model. The only reliable, scientific resource available is FEMA's floodplain maps, which show the entire PRM Site in the 100-year floodplain.

The PRM Site is designed to detain minimal surface hydrology. When overbank flooding occurs, water will be allowed to run off the PRM Site and cause no more inundation than the rainfall which spurred the flooding. While overbank flooding is expected to result in the performance of numerous chemical, biological, and physical functions at the PRM Site, it is expected to have little effect on the duration of inundation and saturation at the PRM Site in an average year, as is modeled in the Water Budget.

All wetland areas of the PRM Site were modeled together in this analysis. They have similar soils and maximum water depths, and water will be allowed to flow among the wetland areas. This model does not account for potential differences across the site or areas of higher or lower elevation. It is designed to show an overall water budget in dry, average, and wet years.

4.0 Results

The main output of the model is a graph of the maximum average depth capacity for the PRM Site to hold water and the duration of this surface water over a normal precipitation year. Graphs are also provided for the wettest and driest year to show the range of expected hydroperiods. Based on the inputs described above, the PRM Site is predicted to experience prolonged saturation or inundation from fall to spring (October to April) in a year of average precipitation, with drier conditions in the summer. This model indicates that the soil is saturated for at least 2 weeks (in fact several months) of the growing season of the average year, meeting the hydrological definition of a wetland. In the wettest year the model shows the PRM Site staying wet through July, with a drier period in late summer, and in the driest year the PRM Site shows only occasional periods of saturation in addition to at least 2 weeks during the growing season.

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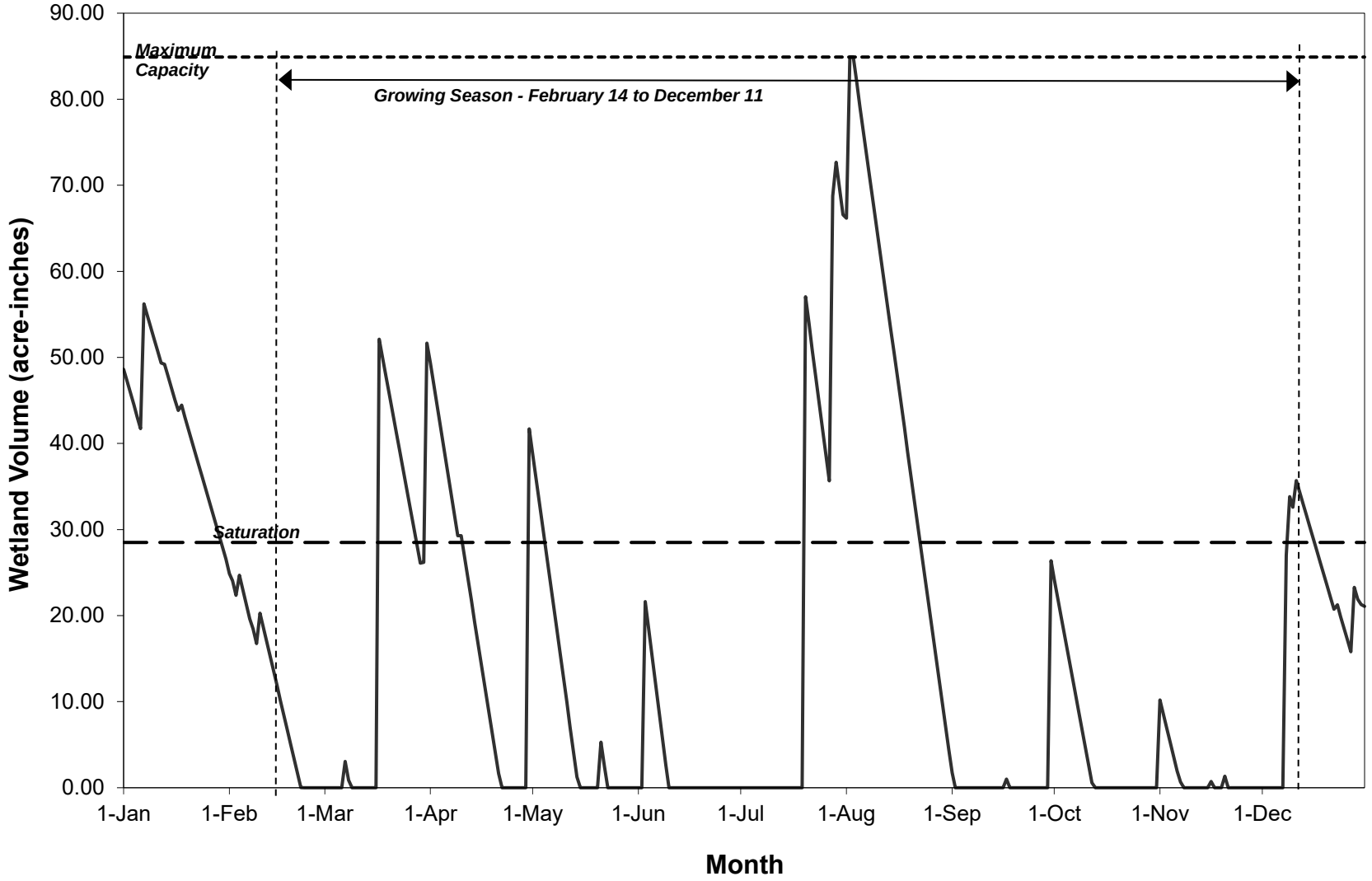
PRM Site
Dry Year - 1988



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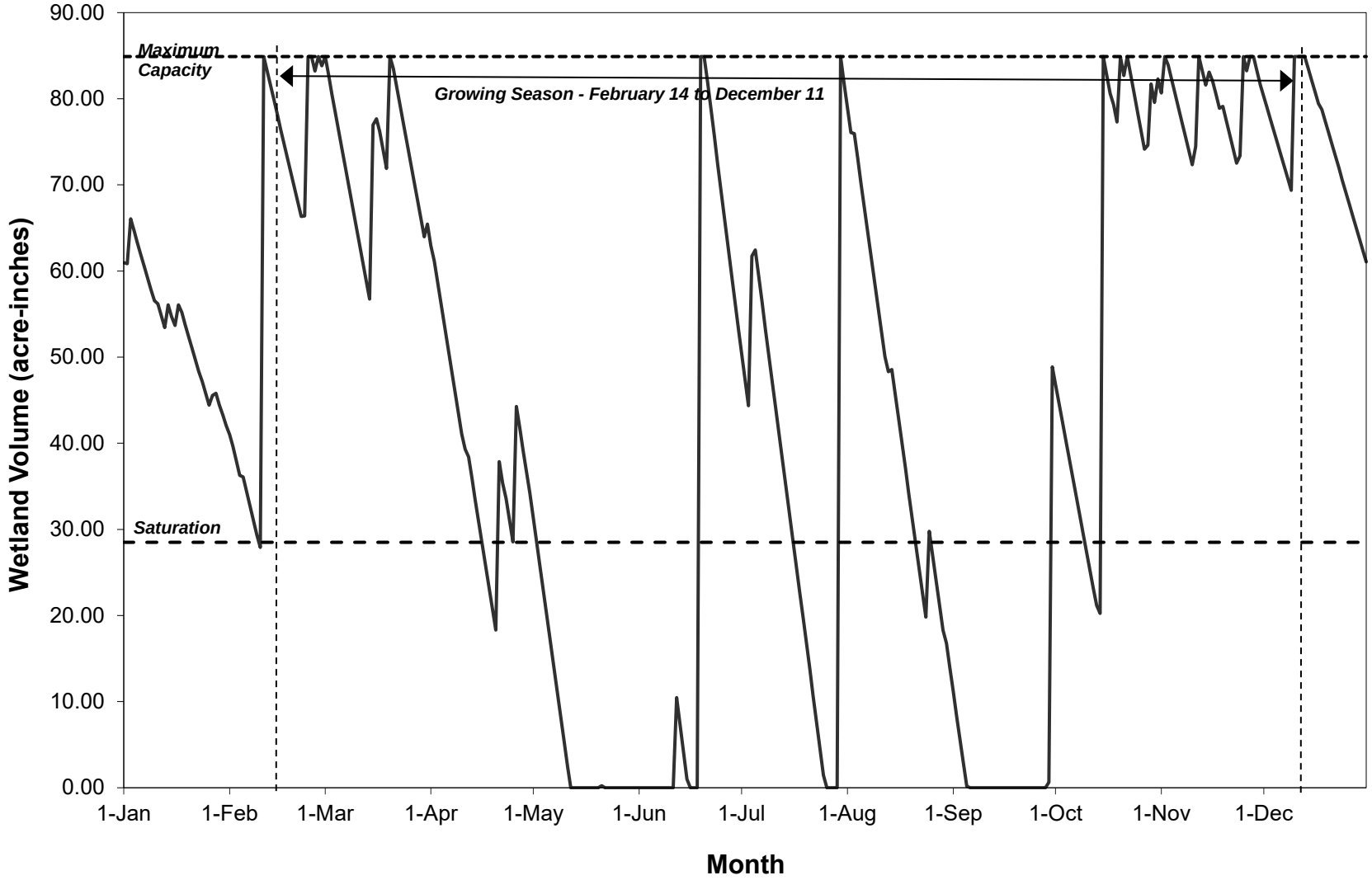
PRM Site
Average Year - 1985



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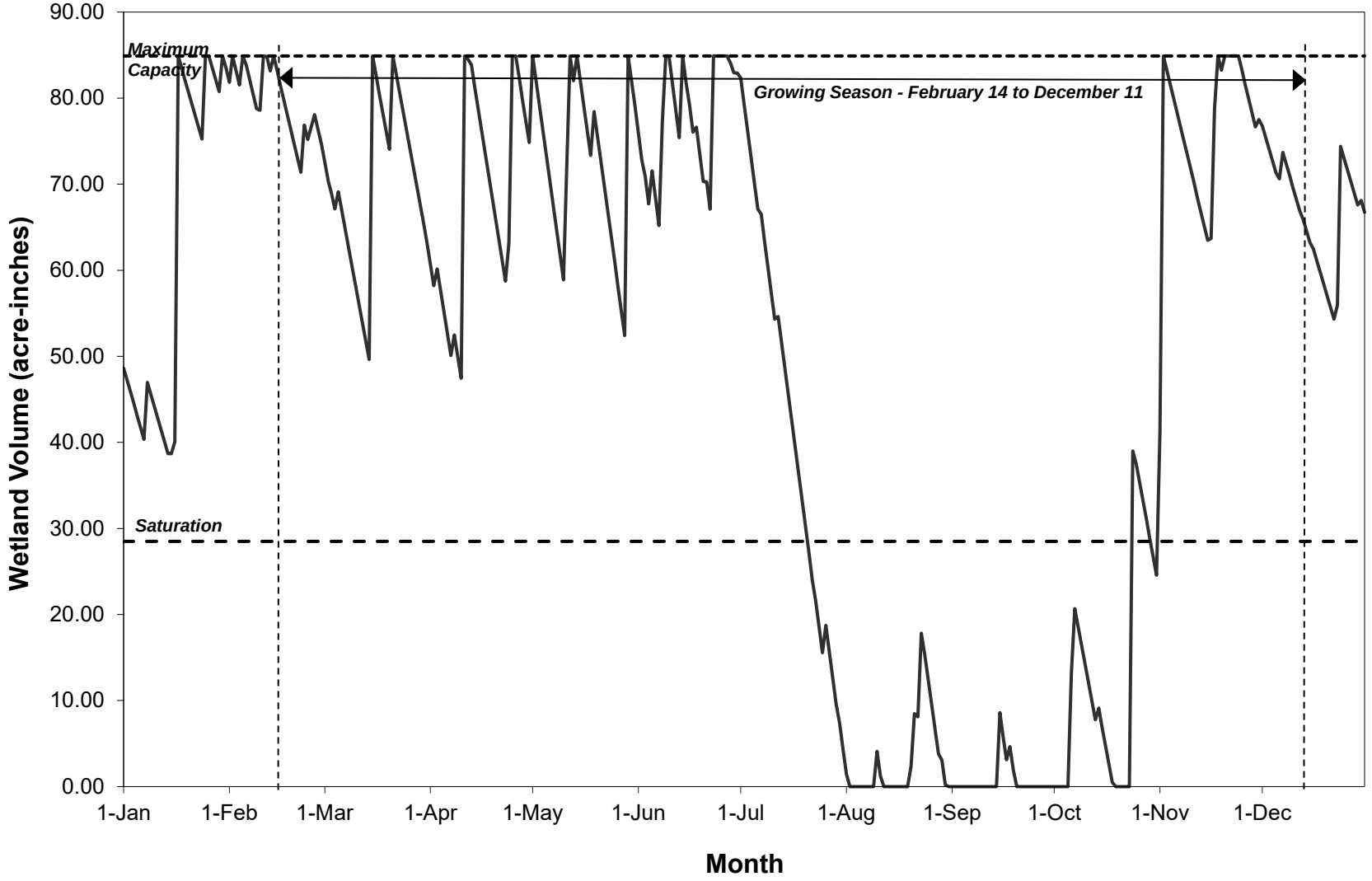
PRM Site
Wet Year - 2004



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Landmark PRM Site
Modified TR55 Results - Wetland Volume
Water Budget - Inputs and Outputs

	(in)
Maximum Wetland Volume	**84.90**
Assumed Initial Wetland Volume	50.00

DRY YEAR
1988

Month	INPUTS				OUTPUTS		WETLAND VOLUME CHANGE						PET Table
	Direct Precipitation	Runoff	Baseflow	Total Water Input	PET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume	Maximum	Saturation	
	(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	inch
										50			
Jan	14.25	4.99	0.00	19.24	29.50	13.18	50.00	-23.44	0.00	26.56	84.90	28.50	2.36
Feb	10.38	0.24	0.00	10.61	35.38	11.91	26.56	-36.67	0.00	0.00	84.90	28.50	2.83
Mar	45.88	43.51	0.00	89.39	54.00	13.18	0.00	22.21	0.00	22.21	84.90	28.50	4.32
Apr	23.25	23.70	0.00	46.95	62.63	12.76	22.21	-28.43	0.00	0.00	84.90	28.50	5.01
May	7.88	1.17	0.00	9.05	76.38	13.18	0.00	-80.51	0.00	0.00	84.90	28.50	6.11
Jun	17.88	10.41	0.00	28.29	82.13	12.76	0.00	-66.60	0.00	0.00	84.90	28.50	6.57
Jul	49.75	54.09	0.00	103.84	81.50	13.18	0.00	9.16	0.00	9.16	84.90	28.50	6.52
Aug	36.50	40.09	0.00	76.59	76.00	13.18	9.16	-12.59	0.00	0.00	84.90	28.50	6.08
Sep	22.25	13.25	0.00	35.50	69.63	12.76	0.00	-46.88	0.00	0.00	84.90	28.50	5.57
Oct	0.00	0.00	0.00	0.00	53.50	13.18	0.00	-66.68	0.00	0.00	84.90	28.50	4.28
Nov	15.25	2.84	0.00	18.09	36.25	13.18	0.00	-31.34	0.00	0.00	84.90	28.50	2.90
Dec	38.25	15.43	0.00	53.68	29.38	12.76	0.00	11.55	0.00	11.55	84.90	28.50	2.35
Totals	**281.5**	**209.72**	**0.00**	**491.22**	**686.25**	**155.20**			**0.00**				

AVG YEAR
1985

Month	INPUTS				OUTPUTS		Change in Wetland Volume			
	Direct Precipitation	Runoff	Baseflow	Total Water Input	ET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume
	(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)
										50
Jan	31.00	3.72	0.00	34.72	29.50	13.18	50.00	-7.96	0.00	42.04
Feb	62.00	73.44	0.00	135.44	35.38	11.91	42.04	88.16	45.30	84.90
Mar	58.13	48.07	0.00	106.19	54.00	13.18	84.90	39.01	39.01	84.90
Apr	29.13	15.05	0.00	44.17	62.63	12.76	84.90	-31.21	0.00	53.69
May	6.88	0.00	0.00	6.88	76.38	13.18	53.69	-82.68	0.00	0.00
Jun	57.25	95.82	0.00	153.07	82.13	12.76	0.00	58.19	0.00	58.19
Jul	49.13	68.42	0.00	117.54	81.50	13.18	58.19	22.86	0.00	81.05
Aug	17.88	3.36	0.00	21.23	76.00	13.18	81.05	-67.95	0.00	13.10
Sep	28.75	28.61	0.00	57.36	69.63	12.76	13.10	-25.02	0.00	0.00
Oct	81.75	103.04	0.00	184.79	53.50	13.18	0.00	118.11	33.21	84.90
Nov	89.00	110.84	0.00	199.84	36.25	13.18	84.90	150.41	150.41	84.90
Dec	51.63	32.84	0.00	84.47	29.38	12.76	84.90	42.34	42.34	84.90
Totals	**562.5**	**583.22**	**0.00**	**1145.72**	**686.25**	**155.20**			**310.28**	

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WET YEAR - 2004

Month	INPUTS				OUTPUTS		Change in Wetland Volume			
	Direct Precipitation	Runoff	Baseflow	Total Water Input	ET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume
	(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)
										50
Jan	81.75	83.81	0.00	165.56	29.50	13.18	50.00	122.87	87.97	84.90
Feb	62.75	31.30	0.00	94.05	35.38	11.91	84.90	46.77	46.77	84.90
Mar	37.13	27.77	0.00	64.89	54.00	13.18	84.90	-2.29	0.00	82.61
Apr	100.13	136.34	0.00	236.47	62.63	12.76	82.61	161.09	158.80	84.90
May	161.88	308.53	0.00	470.40	76.38	13.18	84.90	380.85	380.85	84.90
Jun	164.13	132.41	0.00	296.54	82.13	12.76	84.90	201.66	201.66	84.90
Jul	15.63	0.49	0.00	16.11	81.50	13.18	84.90	-78.57	0.00	6.33
Aug	34.25	5.69	0.00	39.94	76.00	13.18	6.33	-49.24	0.00	0.00
Sep	13.75	2.65	0.00	16.40	69.63	12.76	0.00	-65.99	0.00	0.00
Oct	42.25	28.03	0.00	70.28	53.50	13.18	0.00	3.59	0.00	3.59
Nov	181.88	329.16	0.00	511.04	36.25	13.18	3.59	461.61	380.30	84.90
Dec	24.00	7.36	0.00	31.36	29.38	12.76	84.90	-10.77	0.00	74.13
Totals	**919.5**	**1093.54**	**0.00**	**2013.04**	**686.25**	**155.20**			**1256.35**	

Assumptions

Inputs

Direct precipitation is based on monthly rainfall data

Groundwater inflow may occur but is not considered for this water budget

Basin Runoff is calculated by the SCS Curve Number Method (TR55), modified

Baseflow is included in this model

Overbank Flooding is not a source for this wetland

Outputs

Potential ET for Houston, TX, provided by state climatologist

Soil infiltration is 1x1o-6cm/sec for clay layer per Pierce 1993

Change in wetland volume = Inputs-outputs

Received 24 January 2022

Landmark PRM Site
Modified TR55 Results - Wetland Volume
Water Budget Design Volumes

Site Parameters	**Area (acres)**
Watershed	90
Watershed Wetlands	28
Net Watershed Area	90
Wetland Size	**12.50**

WETLAND COMMUNITY TYPES

	Forested/Shrub			**Emergent**			**Open Water**			**Total Volume**	
Water Volumes (normalized in/area watershed)	Depth (in)	Area (acres)	Volume (acre-in)	Depth (in)	Area (acres)	Volume (acre-in)	Depth (in)	Area (acres)	Volume (acre-in)	acre-in	Normalized (in/area)
Surface Water	4	4.7	18.8	4	7	28	12	0.8	9.6	56.4	4.51
Soil Water above Jurs. Threshold	12	4.7	10.72	12	7	15.96	12	0.8	1.82	28.50	2.28
								Wetland Totals		**84.90**	**6.79**

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Landmark PRM Site
Modified TR55 Results - Wetland Volume
Calculation of Water Volume in Soil Profile

Specific Yield: The ratio of volume of water that will drain under the influence of gravity to the bulk volume of the surficial aquifer.

This tab calcuates the volume of water required to fill the pore spaces in the soils in the wetland, based on soil texture
The pore space available to the water is termed Specific Yield
Specific Yield based on soil textures can be looked up in tables to the right

For sites with monitoring well and rainfall data, an actual specific yield can be calculated per formula below

	Texture	Specific Yield
Soil Type in upper 12 inches	Sandy Loam	19%
Soil type below upper 12 inches	Clay Loam	4%

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Landmark PRM Site
Modified TR55 Results - Wetland Volume

Baseflow

Discharge per square mile of drainage 0 **cfs/sq mile**
Size of Watershed 90 **Acres**

Seasonally Adjusted

Dry Year

	Predicted CFS	Seasonal Adjustment	Adjusted Prediction	cf hour	cf per day	cf per month	acre/feet per month	acre/inches per month
Jan	0.0000	100%	0.0000	0	0	0	0.00	0.00
Feb	0.0000	100%	0.0000	0	0	0	0.00	0.00
Mar	0.0000	50%	0.0000	0	0	0	0.00	0.00
Apr	0.0000	0%	0.0000	0	0	0	0.00	0.00
May	0.0000	0%	0.0000	0	0	0	0.00	0.00
Jun	0.0000	0%	0.0000	0	0	0	0.00	0.00
Jul	0.0000	0%	0.0000	0	0	0	0.00	0.00
Aug	0.0000	0%	0.0000	0	0	0	0.00	0.00
Sep	0.0000	0%	0.0000	0	0	0	0.00	0.00
Oct	0.0000	0%	0.0000	0	0	0	0.00	0.00
Nov	0.0000	0%	0.0000	0	0	0	0.00	0.00
Dec	0.0000	65%	0.0000	0	0	0	0.00	0.00

Average Year

	Predicted CFS	Seasonal Adjustment	Adjusted Prediction	cf hour	cf per day	cf per month	acre/feet per month	acre/inches per month
Jan	0.0000	100%	0.0000	0	0	0	0.00	0.00
Feb	0.0000	100%	0.0000	0	0	0	0.00	0.00
Mar	0.0000	100%	0.0000	0	0	0	0.00	0.00
Apr	0.0000	100%	0.0000	0	0	0	0.00	0.00
May	0.0000	50%	0.0000	0	0	0	0.00	0.00
Jun	0.0000	30%	0.0000	0	0	0	0.00	0.00
Jul	0.0000	10%	0.0000	0	0	0	0.00	0.00
Aug	0.0000	0%	0.0000	0	0	0	0.00	0.00
Sep	0.0000	0%	0.0000	0	0	0	0.00	0.00
Oct	0.0000	0%	0.0000	0	0	0	0.00	0.00
Nov	0.0000	25%	0.0000	0	0	0	0.00	0.00
Dec	0.0000	65%	0.0000	0	0	0	0.00	0.00

Received 24 January 2022

Wet Year

	Predicted CFS	Seasonal Adjustment	Adjusted Prediction	cf hour	cf per day	cf per month	acre/feet per month	acre/inches per month
Jan	0.0000	100%	0.0000	0	0	0	0.00	0.00
Feb	0.0000	100%	0.0000	0	0	0	0.00	0.00
Mar	0.0000	100%	0.0000	0	0	0	0.00	0.00
Apr	0.0000	100%	0.0000	0	0	0	0.00	0.00
May	0.0000	100%	0.0000	0	0	0	0.00	0.00
Jun	0.0000	50%	0.0000	0	0	0	0.00	0.00
Jul	0.0000	10%	0.0000	0	0	0	0.00	0.00
Aug	0.0000	0%	0.0000	0	0	0	0.00	0.00
Sep	0.0000	0%	0.0000	0	0	0	0.00	0.00
Oct	0.0000	25%	0.0000	0	0	0	0.00	0.00
Nov	0.0000	45%	0.0000	0	0	0	0.00	0.00
Dec	0.0000	65%	0.0000	0	0	0	0.00	0.00

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Landmark PRM Site
Modified TR55 Results - Wetland Volume

Groundwater Outflow vertically (infiltration)

Groundwater outflow Rate 0.000001 **cm/sec***
Size of Wetland 12.50 **Acres**

Constant Flow

Dry Year

	ln/sec	in/day	in/month	acre-in/month
Jan	0.00000039	0.03	1.05	13.18
Feb	0.00000039	0.03	0.95	11.91
Mar	0.00000039	0.03	1.05	13.18
Apr	0.00000039	0.03	1.02	12.76
May	0.00000039	0.03	1.05	13.18
Jun	0.00000039	0.03	1.02	12.76
Jul	0.00000039	0.03	1.05	13.18
Aug	0.00000039	0.03	1.05	13.18
Sep	0.00000039	0.03	1.02	12.76
Oct	0.00000039	0.03	1.05	13.18
Nov	0.00000039	0.03	1.05	13.18
Dec	0.00000039	0.03	1.02	12.76

Average Year

	ln/sec	in/day	in/month	acre-in/month
Jan	0.00000039	0.03	1.05	13.18
Feb	0.00000039	0.03	0.95	11.91
Mar	0.00000039	0.03	1.05	13.18
Apr	0.00000039	0.03	1.02	12.76
May	0.00000039	0.03	1.05	13.18
Jun	0.00000039	0.03	1.02	12.76
Jul	0.00000039	0.03	1.05	13.18
Aug	0.00000039	0.03	1.05	13.18
Sep	0.00000039	0.03	1.02	12.76
Oct	0.00000039	0.03	1.05	13.18
Nov	0.00000039	0.03	1.05	13.18
Dec	0.00000039	0.03	1.02	12.76

*Soil infiltration is 1x10-6cm/sec for clay layer per Pierce 1993 (0.000001)

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Wet Year

	ln/sec	in/day	in/month	acre-in/month
Jan	0.00000039	0.03	1.05	13.18
Feb	0.00000039	0.03	0.95	11.91
Mar	0.00000039	0.03	1.05	13.18
Apr	0.00000039	0.03	1.02	12.76
May	0.00000039	0.03	1.05	13.18
Jun	0.00000039	0.03	1.02	12.76
Jul	0.00000039	0.03	1.05	13.18
Aug	0.00000039	0.03	1.05	13.18
Sep	0.00000039	0.03	1.02	12.76
Oct	0.00000039	0.03	1.05	13.18
Nov	0.00000039	0.03	1.05	13.18
Dec	0.00000039	0.03	1.02	12.76

Received 24 January 2022

Seasonally Adjusted

Dry Year

	In/sec	Seasonal Adjustment	Adjusted Prediction	in/day	in/month	acre-in/month
Jan	0.00000040	100%	0.00000040	0.03	1.07	13.34
Feb	0.00000040	100%	0.00000040	0.03	1.07	13.34
Mar	0.00000040	50%	0.00000020	0.02	0.53	6.67
Apr	0.00000040	0%	0.00000000	0.00	0.00	0.00
May	0.00000040	0%	0.00000000	0.00	0.00	0.00
Jun	0.00000040	0%	0.00000000	0.00	0.00	0.00
Jul	0.00000040	0%	0.00000000	0.00	0.00	0.00
Aug	0.00000040	0%	0.00000000	0.00	0.00	0.00
Sep	0.00000040	0%	0.00000000	0.00	0.00	0.00
Oct	0.00000040	0%	0.00000000	0.00	0.00	0.01
Nov	0.00000040	0%	0.00000000	0.00	0.00	0.00
Dec	0.00000040	65%	0.00000026	0.02	0.69	8.67

Average Year

	In/sec	Seasonal Adjustment	Adjusted Prediction	in/day	in/month	acre-in/month
Jan	0.00000040	100%	0.00000040	0.03	1.07	13.34
Feb	0.00000040	100%	0.00000040	0.03	1.07	13.34
Mar	0.00000040	100%	0.00000040	0.03	1.07	13.34
Apr	0.00000040	100%	0.00000040	0.03	1.07	13.34
May	0.00000040	50%	0.00000020	0.02	0.53	6.67
Jun	0.00000040	30%	0.00000012	0.01	0.32	4.00
Jul	0.00000040	10%	0.00000004	0.00	0.11	1.33
Aug	0.00000040	0%	0.00000000	0.00	0.00	0.00
Sep	0.00000040	0%	0.00000000	0.00	0.00	0.00
Oct	0.00000040	0%	0.00000000	0.00	0.00	0.01
Nov	0.00000040	25%	0.00000010	0.01	0.27	3.33
Dec	0.00000040	65%	0.00000026	0.02	0.69	8.67

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Wet Year

	In/sec	Seasonal Adjustment	Adjusted Prediction	in/day	in/month	acre-in/month
Jan	0.00000040	100%	0.00000040	0.03	1.07	13.34
Feb	0.00000040	100%	0.00000040	0.03	1.07	13.34
Mar	0.00000040	100%	0.00000040	0.03	1.07	13.34
Apr	0.00000040	100%	0.00000040	0.03	1.07	13.34
May	0.00000040	100%	0.00000040	0.03	1.07	13.34
Jun	0.00000040	50%	0.00000020	0.02	0.53	6.67
Jul	0.00000040	10%	0.00000004	0.00	0.11	1.33
Aug	0.00000040	0%	0.00000000	0.00	0.00	0.00
Sep	0.00000040	0%	0.00000000	0.00	0.00	0.00
Oct	0.00000040	25%	0.00000010	0.01	0.27	3.33
Nov	0.00000040	45%	0.00000018	0.02	0.48	6.00
Dec	0.00000040	65%	0.00000026	0.02	0.69	8.67

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Landmark PRM Site
Modified TR55 Results - Wetland Volume
Water Budget - Run Volume Calculations

Watershed Acreage Characteristics

Site Area	12.87	acres
Watershed Area	90	acres
Wetlands in Watershed	28	acres
Net Watershed Area	90	acres
Watershed/Wetland Runoff Coefficient	6.99	Ratio

Watershed Runoff Work Sheet

Dry Year

1988

Month	Precipitation	Runoff per acre	Runoff Volume	Runoff Delivered to Wetland
	(in/month)	(in)	(acre-in)	(inches)
Jan	1.14	0.06	5	0.39
Feb	0.83	0.00	0	0.02
Mar	3.67	0.48	44	3.38
Apr	1.86	0.26	24	1.84
May	0.63	0.01	1	0.09
Jun	1.43	0.12	10	0.81
Jul	3.98	0.60	54	4.20
Aug	2.92	0.45	40	3.11
Sep	1.78	0.15	13	1.03
Oct	0.00	0.00	0	0.00
Nov	1.22	0.03	3	0.22
Dec	3.06	0.17	15	1.20
Totals	**22.52**	**2.33**	**210**	**16.30**

Average Year

1985

Month	Precipitation	Runoff per acre	Runoff Volume	Runoff Delivered to Wetland
	(in/month)	(in)	(acre-in)	(acre-in)
Jan	2.48	0.04	4	0.29
Feb	4.96	0.82	73	5.71
Mar	4.65	0.53	48	3.73
Apr	2.33	0.17	15	1.17
May	0.55	0.00	0	0.00
Jun	4.58	1.06	96	7.45
Jul	3.93	0.76	68	5.32
Aug	1.43	0.04	3	0.26
Sep	2.30	0.32	29	2.22
Oct	6.54	1.14	103	8.01
Nov	7.12	1.23	111	8.61
Dec	4.13	0.36	33	2.55
Totals	**45.00**	**6.48**	**583**	**45.32**

Wet Year

2004

Month	Precipitation	Runoff per acre	Runoff Volume	Runoff Delivered to Wetland
	(in/month)	(in)	(acre-in)	(acre-in)
Jan	6.54	0.93	84	6.51
Feb	5.02	0.35	31	2.43
Mar	2.97	0.31	28	2.16
Apr	8.01	1.51	136	10.59
May	12.95	3.43	309	23.97
Jun	13.13	1.47	132	10.29
Jul	1.25	0.01	0	0.04
Aug	2.74	0.06	6	0.44
Sep	1.10	0.03	3	0.21
Oct	3.38	0.31	28	2.18
Nov	14.55	3.66	329	25.58
Dec	1.92	0.08	7	0.57
Totals	**73.56**	**12.15**	**1094**	**84.97**

Received 24 January 2022

Landmark PRM Site
Modified TR55 Results - Wetland Volume
Water Budget - Watershed Curve Number Calculations
With Ia/S = 0.05
Weighted Runoff Curve Number Calculation

This is a modified version of the TR55 runoff model
It has been modified to produce more reliable results under smaller rainfall events
The initial abstraction has been reduced (0.20 to 0.05) to produce more runoff during small rain events
This modification is supported by extensive research

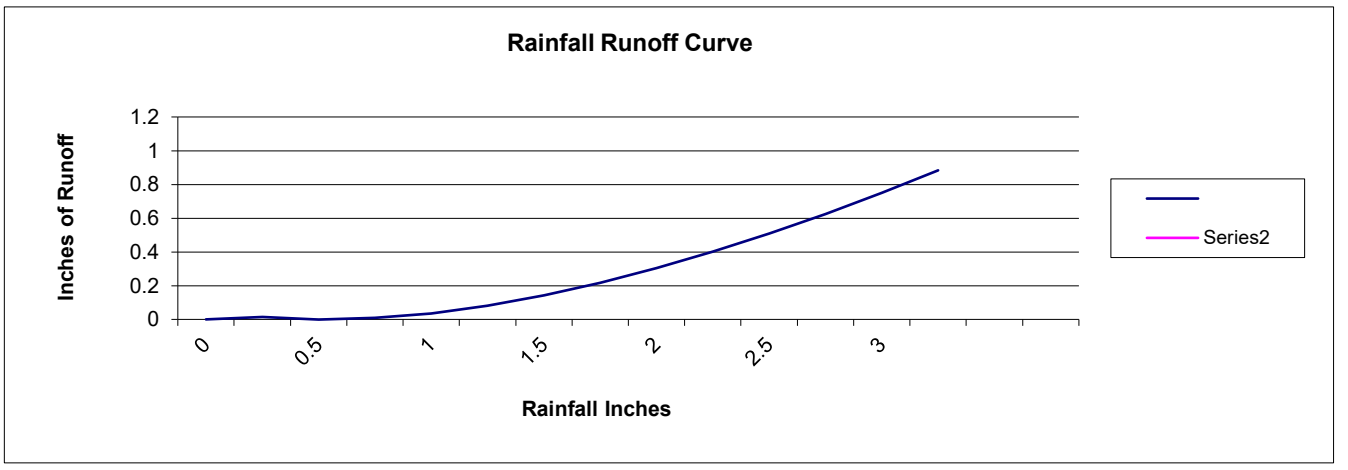
Step 1 Determine drainage area providing sheet flow to Wetlands
Setp 2 Determine land condition and soils and enter below
Step 3 Look up CN values for land use/ soil combinations (input below in CN (0.20)

Subwatershed	Cover	Soil	CN (0.20)	CN (0.05)	Area	CN*Area
					(acres)	
	Pasture/Range -Good	C	74	64	90	5753
					90	**5,753**

Weighted CN for Watershed	**63.93**
Retention (S)	**5.64**
Initial Abstraction (Ia) (Minimum P for runoff)	**0.28**

Rainfall-Runoff Curve

P	Q
0	0.01
0.25	0.000
0.5	0.008
0.75	0.036
1	0.081
1.25	0.142
1.5	0.216
1.75	0.303
2	0.401
2.25	0.509
2.5	0.626
2.75	0.751
3	0.883



Received 24 January 2022

Landmark PRM Site
Modified TR55 Results - Wetland Volume
Water Budget - Daily Runoff for Month and Year

Minimium Rainfall event generating runoff
0.28 Inches

Dry Year
1988

Mo/Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total
Jan	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Feb	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.48
Apr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.26
May	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Jun	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Jul	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.01	0.00	0.00	0.60
Aug	0.00	0.42	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
Sep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.15
Oct	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nov	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Dec	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.17
																												Yearly Total				**2.33**

Average Year
1985

Mo/Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total
Jan	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Feb	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82
Mar	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53
Apr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.17
May	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jun	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06
Jul	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.76
Aug	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Sep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.32
Oct	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.02	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	1.14
Nov	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.01	0.00	0.00	0.00	0.00	1.23
Dec	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.04	0.06	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
																												Yearly Total				**6.48**

Wet Year
2004

Mo/Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total
Jan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.11	0.00	0.00	0.00	0.07	0.00	0.93
Feb	0.00	0.07	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
Mar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
Apr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.29	0.25	0.00	0.00	0.00	0.00	0.00	1.51
May	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.53	0.00	0.49	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.00	3.43
Jun	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.05	0.22	0.22	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.34	0.04	0.12	0.03	0.00	0.00	0.00	0.00	1.47
Jul	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Aug	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Sep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Oct	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
Nov	0.07	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.02	0.00	0.40	0.00	2.23	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.66
Dec	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
																														Yearly Total		**12.15**

Received 24 January 2022

Landmark PRM Site
Modified TR55 Results - Wetland Volume
Water Budget - Daily Precipitation

Dry YEAR
1988

Mo/Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total
Jan	0	0	0	0	0	0	0.87	0	0	0	0	0	0.1	0	0	0	0.01	0.16	0	0	0	0	0	0	0	0	0	0	0	0	0	1.14
Feb	0	0.07	0	0.32	0	0	0	0.04	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0.83
Mar	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0	1.86	0	0	0	0	0	0	0	0	0	0	0	0	0.18	1.23	3.67
Apr	0.02	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.64		1.86
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.56	0.01	0	0	0	0	0	0	0.06	0	0	0.63
Jun	0.16	0	1.15	0	0	0	0	0	0	0	0	0	0	0	0.03	0	0	0	0	0	0	0.02	0	0	0.04	0.03	0	0	0	0		1.43
Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	1.98	0	0	0	0	0	0	0	1.45	0.5	0	0	3.98
Aug	0.2	2.05	0.66	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.92
Sep	0	0.02	0	0.18	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.01	0	0	0	0	0	0	0	0	0	0	0	1.27		1.78
Oct	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Nov	0.72	0	0	0	0	0	0.03	0	0	0	0	0	0	0	0	0.19	0	0	0	0.24	0	0	0	0.01	0.03	0	0	0	0	0		1.22
Dec	0	0	0	0	0	0	0	1.25	0.56	0.01	0.35	0	0	0	0	0	0	0	0	0	0	0	0.15	0	0	0	0	0.59	0	0.06	0.09	3.06
																														Yearly Total		**22.52**

Average YEAR
1985

Mo/Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total
Jan	0.74	0.1	0.48	0	0	0	0	0	0	0.01	0.08			0.32	0	0.03	0.3	0.04	0	0	0	0	0	0.02	0	0	0.2	0.13	0	0.02	0.01	2.48
Feb	0.05	0.03	0	0	0.12	0	0	0	0	0.02	2.39	0	0	0	0	0	0	0	0	0	0	0	0.14	1.58	0.31	0	0.27	0.05				4.96
Mar	1.11	0	0	0	0	0	0	0	0	0	0	0	0	0	1.08	0.23	0.06	0	0	1.82	0.06	0	0	0	0	0	0	0	0	0	0.29	4.65
Apr	0	0.06	0	0	0	0	0	0	0	0	0.06	0.13	0	0	0	0	0	0	0	0	1.07	0	0.06	0	0	0.95	0	0	0	0		2.33
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08	0	0.01	0.12	0.05	0	0	0.25	0.04	0	0	0	0	0	0	0	0	0	0.55
Jun	0	0	0	0	0	0	0	0	0	0	0	0.79	0	0	0	0	0	0	3.23	0.54	0.02	0	0	0	0	0	0	0	0	0		4.58
Jul	0	0	0	1.02	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0	2.6	0	3.93
Aug	0	0	0.22	0	0	0	0	0	0	0	0	0	0.09	0.25	0	0	0	0	0	0	0	0	0	0	0.76	0	0	0	0	0.11	0	1.43
Sep	0	0	0	0	0	0	0	0	0.05	0	0.12	0	0.07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.27	1.79		2.30
Oct	0.01	0	0	0	0	0	0	0	0	0	0	0	0.01	0.1	3.01	0	0	0.07	0.01	0.63	0	1.5	0	0	0	0	0	0.21	0.61	0	0.38	6.54
Nov	0	0.46	0.05	0	0	0	0	0	0	0	0.3	2.42	0	0	0.25	0.05	0.01	0	0.15	0	0	0	0	0.2	2.5	0	0.56	0.17	0	0		7.12
Dec	0	0	0	0	0	0	0	0	0	1.38	0.78	0.92	1	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	4.13
																														Yearly Total		**45.00**

Wet YEAR
2004

Mo/Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total
Jan	0	0	0	0	0	0	0	0.55	0	0	0	0	0	0	0.11	0.22	2.55	0	0	0	0	0	0	0	1	1.14	0	0	0	0.97	0	6.54
Feb	0	0.97	0	0	0.7	0.05	0	0	0	0.12	1.55	0.13	0	0.41	0	0	0	0	0	0	0	0	0.51	0	0.25	0.25	0	0	0.08			5.02
Mar	0	0	0.06	0.03	0.33	0	0	0	0	0	0	0	0	0	1.5	0	0	0	0	0	1.05	0	0	0	0	0	0	0	0	0	0	2.97
Apr	0	0	0.35	0	0	0	0	0.38	0	0	3.15	0.17	0.15	0	0	0	0	0	0	0	0	0	0	0.5	1.72	1.59	0	0	0	0		8.01
May	3.5		0	0	0	0	0	0	0	0	0.9	2.3	0	2.2	0	0	0	0	0.55	0	0	0	0	0	0	0	0	0	3.5	0	0	12.95
Jun	0	0	0.1	0	0.5	0	0	0.85	1.5	1.5	0	0	0	1.8	0	0.05	0	0.3	0	0	0.25	0	1.2	1.85	0.75	1.18	0.7	0.19	0.16	0.25		13.13
Jul	0.2	0	0	0	0	0	0.2	0	0	0	0	0.27	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0.46	0	0	0	0.07	0	1.25
Aug	0	0	0	0	0	0	0	0	0	0.5	0	0.05	0	0	0	0	0	0	0.04	0.4	0.6	0.2	0.75	0.03	0	0	0	0	0.17	0	0	2.74
Sep	0	0	0.03	0.03	0	0	0	0	0	0	0	0	0	0	0.7	0	0	0.34	0	0	0	0	0	0	0	0	0	0	0	0			1.10
Oct	0	0	0	0	0	0.85	0.63	0	0	0	0	0	0	0.28	0	0	0	0	0	0	0	0	0	1.57	0.05	0	0	0	0	0	0	3.38
Nov	0.95	1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15	0.9	0.61	0	2	0.24	5.11	2.36	0.23	0	0	0	0	0	0.2		14.55
Dec	0.05	0	0	0	0	0.05	0.35	0	0	0	0	0	0.03	0	0	0.05	0	0	0	0	0	0	0.24	1	0	0	0	0	0	0.15	0	1.92
																														Yearly Total		**73.56**

Received 24 January 2022

Landmark PRM Site
Modified TR55 Results - Wetland Volume
Water Budget - Inputs and Outputs

	(in)
Maximum Wetland Volume	84.90
Assumed Initial Wetland Volume	50.00

DRY YEAR
1988

Month	Days in Month	INPUTS				OUTPUTS		WETLAND VOLUME CHANGE						PET Table
		Direct Precipitation	Runoff	Baseflow	Total Water Input	PET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume	Maximum	Saturation	
		(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	inch
											50			
Jan	31	14.25	4.99	0.00	19.24	29.50	13.18	50.00	-23.44	0.00	26.56	84.90	28.50	2.36
Feb	28	10.38	0.24	0.00	10.61	35.38	11.91	26.56	-36.67	0.00	0.00	84.90	28.50	2.83
Mar	31	45.88	43.51	0.00	89.39	54.00	13.18	0.00	22.21	0.00	22.21	84.90	28.50	4.32
Apr	30	23.25	23.70	0.00	46.95	62.63	12.76	22.21	-28.43	0.00	0.00	84.90	28.50	5.01
May	31	7.88	1.17	0.00	9.05	76.38	13.18	0.00	-80.51	0.00	0.00	84.90	28.50	6.11
Jun	30	17.88	10.41	0.00	28.29	82.13	12.76	0.00	-66.60	0.00	0.00	84.90	28.50	6.57
Jul	31	49.75	54.09	0.00	103.84	81.50	13.18	0.00	9.16	0.00	9.16	84.90	28.50	6.52
Aug	31	36.50	40.09	0.00	76.59	76.00	13.18	9.16	-12.59	0.00	0.00	84.90	28.50	6.08
Sep	30	22.25	13.25	0.00	35.50	69.63	12.76	0.00	-46.88	0.00	0.00	84.90	28.50	5.57
Oct	31	0.00	0.00	0.00	0.00	53.50	13.18	0.00	-66.68	0.00	0.00	84.90	28.50	4.28
Nov	30	15.25	2.84	0.00	18.09	36.25	13.18	0.00	-31.34	0.00	0.00	84.90	28.50	2.90
Dec	31	38.25	15.43	0.00	53.68	29.38	12.76	0.00	11.55	0.00	11.55	84.90	28.50	2.35
Totals		**281.5**	**209.72**	**0.00**	**491.22**	**686.25**	**155.20**			**0.00**				

AVG YEAR
1985

Month		INPUTS				OUTPUTS		Change in Wetland Volume			
		Direct Precipitation	Runoff	Baseflow	Total Water Input	ET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume
		(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)
											50
Jan	31	31.00	3.72	0.00	34.72	29.50	13.18	50.00	-7.96	0.00	42.04
Feb	28	62.00	73.44	0.00	135.44	35.38	11.91	42.04	88.16	45.30	84.90
Mar	31	58.13	48.07	0.00	106.19	54.00	13.18	84.90	39.01	39.01	84.90
Apr	30	29.13	15.05	0.00	44.17	62.63	12.76	84.90	-31.21	0.00	53.69
May	31	6.88	0.00	0.00	6.88	76.38	13.18	53.69	-82.68	0.00	0.00
Jun	30	57.25	95.82	0.00	153.07	82.13	12.76	0.00	58.19	0.00	58.19
Jul	31	49.13	68.42	0.00	117.54	81.50	13.18	58.19	22.86	0.00	81.05
Aug	31	17.88	3.36	0.00	21.23	76.00	13.18	81.05	-67.95	0.00	13.10
Sep	30	28.75	28.61	0.00	57.36	69.63	12.76	13.10	-25.02	0.00	0.00
Oct	31	81.75	103.04	0.00	184.79	53.50	13.18	0.00	118.11	33.21	84.90
Nov	30	89.00	110.84	0.00	199.84	36.25	13.18	84.90	150.41	150.41	84.90
Dec	31	51.63	32.84	0.00	84.47	29.38	12.76	84.90	42.34	42.34	84.90
Totals		**562.5**	**583.22**	**0.00**	**1145.72**	**686.25**	**155.20**			**310.28**	

WET YEAR -
2004

Month		INPUTS				OUTPUTS		Change in Wetland Volume			
		Direct Precipitation	Runoff	Baseflow	Total Water Input	ET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume

Received 24 January 2022

		(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)
											50
Jan	31	81.75	83.81	0.00	165.56	29.50	13.18	50.00	122.87	87.97	84.90
Feb	28	62.75	31.30	0.00	94.05	35.38	11.91	84.90	46.77	46.77	84.90
Mar	31	37.13	27.77	0.00	64.89	54.00	13.18	84.90	-2.29	0.00	82.61
Apr	30	100.13	136.34	0.00	236.47	62.63	12.76	82.61	161.09	158.80	84.90
May	31	161.88	308.53	0.00	470.40	76.38	13.18	84.90	380.85	380.85	84.90
Jun	30	164.13	132.41	0.00	296.54	82.13	12.76	84.90	201.66	201.66	84.90
Jul	31	15.63	0.49	0.00	16.11	81.50	13.18	84.90	-78.57	0.00	6.33
Aug	31	34.25	5.69	0.00	39.94	76.00	13.18	6.33	-49.24	0.00	0.00
Sep	30	13.75	2.65	0.00	16.40	69.63	12.76	0.00	-65.99	0.00	0.00
Oct	31	42.25	28.03	0.00	70.28	53.50	13.18	0.00	3.59	0.00	3.59
Nov	30	181.88	329.16	0.00	511.04	36.25	13.18	3.59	461.61	380.30	84.90
Dec	31	24.00	7.36	0.00	31.36	29.38	12.76	84.90	-10.77	0.00	74.13
Totals		**919.5**	**1093.54**	**0.00**	**2013.04**	**686.25**	**155.20**			**1256.35**	

Assumptions

Inputs

Direct precipitation is based on monthly rainfall data

Groundwater inflow may occur but is not considered for this water budget

Basin Runoff is calculated by the SCS Curve Number Method (TR55), modified

Baseflow is included in this model

Overbank Flooding is not a source for this wetland

Outputs

Potential ET for Houston, TX, provided by state climatologist

Soil infiltration is 1x1o-6cm/sec for clay layer per Pierce 1993

Change in wetland volume = Inputs-outputs

DRY YEAR
1988

Month	Day	INPUTS				OUTPUTS		WETLAND VOLUME CHANGE						
		Direct Precipitation	Runoff	Baseflow	Total Water Input	PET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume	Maximum	Saturation	Resulting Wetland Depth
		(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(in)
											50.00			
Jan	1	0.00	0.00	0.00	0.00	0.95	0.43	50.00	-1.38	0.00	48.62	84.90	28.50	1.37
Jan	2	0.00	0.00	0.00	0.00	0.95	0.43	48.62	-1.38	0.00	47.25	84.90	28.50	1.26
Jan	3	0.00	0.00	0.00	0.00	0.95	0.43	47.25	-1.38	0.00	45.87	84.90	28.50	1.15
Jan	4	0.00	0.00	0.00	0.00	0.95	0.43	45.87	-1.38	0.00	44.49	84.90	28.50	1.04
Jan	5	0.00	0.00	0.00	0.00	0.95	0.43	44.49	-1.38	0.00	43.12	84.90	28.50	0.93
Jan	6	0.00	0.00	0.00	0.00	0.95	0.43	43.12	-1.38	0.00	41.74	84.90	28.50	0.82
Jan	7	10.88	4.99	0.00	15.87	0.95	0.43	41.74	14.49	0.00	56.23	84.90	28.50	1.70
Jan	8	0.00	0.00	0.00	0.00	0.95	0.43	56.23	-1.38	0.00	54.85	84.90	28.50	1.59
Jan	9	0.00	0.00	0.00	0.00	0.95	0.43	54.85	-1.38	0.00	53.47	84.90	28.50	1.48
Jan	10	0.00	0.00	0.00	0.00	0.95	0.43	53.47	-1.38	0.00	52.10	84.90	28.50	1.37
Jan	11	0.00	0.00	0.00	0.00	0.95	0.43	52.10	-1.38	0.00	50.72	84.90	28.50	1.26
Jan	12	0.00	0.00	0.00	0.00	0.95	0.43	50.72	-1.38	0.00	49.34	84.90	28.50	1.15
Jan	13	1.25	0.00	0.00	1.25	0.95	0.43	49.34	-0.13	0.00	49.22	84.90	28.50	1.14
Jan	14	0.00	0.00	0.00	0.00	0.95	0.43	49.22	-1.38	0.00	47.84	84.90	28.50	1.03
Jan	15	0.00	0.00	0.00	0.00	0.95	0.43	47.84	-1.38	0.00	46.46	84.90	28.50	0.92
Jan	16	0.00	0.00	0.00	0.00	0.95	0.43	46.46	-1.38	0.00	45.09	84.90	28.50	0.81
Jan	17	0.13	0.00	0.00	0.13	0.95	0.43	45.09	-1.25	0.00	43.84	84.90	28.50	0.71
Jan	18	2.00	0.00	0.00	2.00	0.95	0.43	43.84	0.62	0.00	44.46	84.90	28.50	0.76
Jan	19	0.00	0.00	0.00	0.00	0.95	0.43	44.46	-1.38	0.00	43.08	84.90	28.50	0.65
Jan	20	0.00	0.00	0.00	0.00	0.95	0.43	43.08	-1.38	0.00	41.70	84.90	28.50	0.54
Jan	21	0.00	0.00	0.00	0.00	0.95	0.43	41.70	-1.38	0.00	40.33	84.90	28.50	0.43
Jan	22	0.00	0.00	0.00	0.00	0.95	0.43	40.33	-1.38	0.00	38.95	84.90	28.50	0.32
Jan	23	0.00	0.00	0.00	0.00	0.95	0.43	38.95	-1.38	0.00	37.57	84.90	28.50	0.21
Jan	24	0.00	0.00	0.00	0.00	0.95	0.43	37.57	-1.38	0.00	36.20	84.90	28.50	0.10
Jan	25	0.00	0.00	0.00	0.00	0.95	0.43	36.20	-1.38	0.00	34.82	84.90	28.50	-0.05
Jan	26	0.00	0.00	0.00	0.00	0.95	0.43	34.82	-1.38	0.00	33.44	84.90	28.50	-0.63

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Jan	27	0.00	0.00	0.00	0.00	0.95	0.43	33.44	-1.38	0.00	32.07	84.90	28.50	-1.21
Jan	28	0.00	0.00	0.00	0.00	0.95	0.43	32.07	-1.38	0.00	30.69	84.90	28.50	-1.79
Jan	29	0.00	0.00	0.00	0.00	0.95	0.43	30.69	-1.38	0.00	29.31	84.90	28.50	-2.37
Jan	30	0.00	0.00	0.00	0.00	0.95	0.43	29.31	-1.38	0.00	27.94	84.90	28.50	-2.95
Jan	31	0.00	0.00	0.00	0.00	0.95	0.43	27.94	-1.38	0.00	26.56	84.90	28.50	-3.53
Feb	1	0.00	0.00	0.00	0.00	1.26	0.43	26.56	-1.69	0.00	24.87	84.90	28.50	-4.24
Feb	2	0.88	0.00	0.00	0.88	1.26	0.43	24.87	-0.81	0.00	24.06	84.90	28.50	-4.58
Feb	3	0.00	0.00	0.00	0.00	1.26	0.43	24.06	-1.69	0.00	22.37	84.90	28.50	-5.29
Feb	4	4.00	0.02	0.00	4.02	1.26	0.43	22.37	2.33	0.00	24.70	84.90	28.50	-4.32
Feb	5	0.00	0.00	0.00	0.00	1.26	0.43	24.70	-1.69	0.00	23.01	84.90	28.50	-5.03
Feb	6	0.00	0.00	0.00	0.00	1.26	0.43	23.01	-1.69	0.00	21.33	84.90	28.50	-5.74
Feb	7	0.00	0.00	0.00	0.00	1.26	0.43	21.33	-1.69	0.00	19.64	84.90	28.50	-6.45
Feb	8	0.50	0.00	0.00	0.50	1.26	0.43	19.64	-1.19	0.00	18.45	84.90	28.50	-6.95
Feb	9	0.00	0.00	0.00	0.00	1.26	0.43	18.45	-1.69	0.00	16.76	84.90	28.50	-7.66
Feb	10	5.00	0.22	0.00	5.22	1.26	0.43	16.76	3.53	0.00	20.29	84.90	28.50	-6.24
Feb	11	0.00	0.00	0.00	0.00	1.26	0.43	20.29	-1.69	0.00	18.60	84.90	28.50	-6.95
Feb	12	0.00	0.00	0.00	0.00	1.26	0.43	18.60	-1.69	0.00	16.91	84.90	28.50	-7.66
Feb	13	0.00	0.00	0.00	0.00	1.26	0.43	16.91	-1.69	0.00	15.22	84.90	28.50	-8.37
Feb	14	0.00	0.00	0.00	0.00	1.26	0.43	15.22	-1.69	0.00	13.53	84.90	28.50	-9.08
Feb	15	0.00	0.00	0.00	0.00	1.26	0.43	13.53	-1.69	0.00	11.85	84.90	28.50	-9.79
Feb	16	0.00	0.00	0.00	0.00	1.26	0.43	11.85	-1.69	0.00	10.16	84.90	28.50	-10.50
Feb	17	0.00	0.00	0.00	0.00	1.26	0.43	10.16	-1.69	0.00	8.47	84.90	28.50	-11.21
Feb	18	0.00	0.00	0.00	0.00	1.26	0.43	8.47	-1.69	0.00	6.78	84.90	28.50	-11.93
Feb	19	0.00	0.00	0.00	0.00	1.26	0.43	6.78	-1.69	0.00	5.09	84.90	28.50	-12.00
Feb	20	0.00	0.00	0.00	0.00	1.26	0.43	5.09	-1.69	0.00	3.40	84.90	28.50	-12.00
Feb	21	0.00	0.00	0.00	0.00	1.26	0.43	3.40	-1.69	0.00	1.71	84.90	28.50	-12.00
Feb	22	0.00	0.00	0.00	0.00	1.26	0.43	1.71	-1.69	0.00	0.03	84.90	28.50	-12.00
Feb	23	0.00	0.00	0.00	0.00	1.26	0.43	0.03	-1.69	0.00	0.00	84.90	28.50	-12.00
Feb	24	0.00	0.00	0.00	0.00	1.26	0.43	0.00	-1.69	0.00	0.00	84.90	28.50	-12.00
Feb	25	0.00	0.00	0.00	0.00	1.26	0.43	0.00	-1.69	0.00	0.00	84.90	28.50	-12.00
Feb	26	0.00	0.00	0.00	0.00	1.26	0.43	0.00	-1.69	0.00	0.00	84.90	28.50	-12.00
Feb	27	0.00	0.00	0.00	0.00	1.26	0.43	0.00	-1.69	0.00	0.00	84.90	28.50	-12.00
Feb	28	0.00	0.00	0.00	0.00	1.26	0.43	0.00	-1.69	0.00	0.00	84.90	28.50	-12.00
Mar	1	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	2	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	3	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	4	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	5	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	6	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	7	5.00	0.22	0.00	5.22	1.74	0.43	0.00	3.05	0.00	3.05	84.90	28.50	-10.78
Mar	8	0.00	0.00	0.00	0.00	1.74	0.43	3.05	-2.17	0.00	0.88	84.90	28.50	-11.69
Mar	9	0.00	0.00	0.00	0.00	1.74	0.43	0.88	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	10	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	11	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	12	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	13	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	14	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	15	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	16	0.00	0.00	0.00	0.00	1.74	0.43	0.00	-2.17	0.00	0.00	84.90	28.50	-12.00
Mar	17	23.25	31.03	0.00	54.28	1.74	0.43	0.00	52.11	0.00	52.11	84.90	28.50	0.16
Mar	18	0.00	0.00	0.00	0.00	1.74	0.43	52.11	-2.17	0.00	49.94	84.90	28.50	-0.07
Mar	19	0.00	0.00	0.00	0.00	1.74	0.43	49.94	-2.17	0.00	47.78	84.90	28.50	-0.99
Mar	20	0.00	0.00	0.00	0.00	1.74	0.43	47.78	-2.17	0.00	45.61	84.90	28.50	-1.90
Mar	21	0.00	0.00	0.00	0.00	1.74	0.43	45.61	-2.17	0.00	43.44	84.90	28.50	-2.81
Mar	22	0.00	0.00	0.00	0.00	1.74	0.43	43.44	-2.17	0.00	41.28	84.90	28.50	-3.72
Mar	23	0.00	0.00	0.00	0.00	1.74	0.43	41.28	-2.17	0.00	39.11	84.90	28.50	-4.64
Mar	24	0.00	0.00	0.00	0.00	1.74	0.43	39.11	-2.17	0.00	36.94	84.90	28.50	-5.55
Mar	25	0.00	0.00	0.00	0.00	1.74	0.43	36.94	-2.17	0.00	34.77	84.90	28.50	-6.46
Mar	26	0.00	0.00	0.00	0.00	1.74	0.43	34.77	-2.17	0.00	32.61	84.90	28.50	-7.37

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Mar	27	0.00	0.00	0.00	0.00	1.74	0.43	32.61	-2.17	0.00	30.44	84.90	28.50	-8.29
Mar	28	0.00	0.00	0.00	0.00	1.74	0.43	30.44	-2.17	0.00	28.27	84.90	28.50	-9.20
Mar	29	0.00	0.00	0.00	0.00	1.74	0.43	28.27	-2.17	0.00	26.11	84.90	28.50	-10.11
Mar	30	2.25	0.00	0.00	2.25	1.74	0.43	26.11	0.08	0.00	26.19	84.90	28.50	-10.08
Mar	31	15.38	12.27	0.00	27.64	1.74	0.43	26.19	25.48	0.00	51.66	84.90	28.50	-2.95
Apr	1	0.25	0.00	0.00	0.25	2.09	0.43	51.66	-2.26	0.00	49.40	84.90	28.50	-3.90
Apr	2	0.00	0.00	0.00	0.00	2.09	0.43	49.40	-2.51	0.00	46.89	84.90	28.50	-4.96
Apr	3	0.00	0.00	0.00	0.00	2.09	0.43	46.89	-2.51	0.00	44.38	84.90	28.50	-6.02
Apr	4	0.00	0.00	0.00	0.00	2.09	0.43	44.38	-2.51	0.00	41.86	84.90	28.50	-7.08
Apr	5	0.00	0.00	0.00	0.00	2.09	0.43	41.86	-2.51	0.00	39.35	84.90	28.50	-8.13
Apr	6	0.00	0.00	0.00	0.00	2.09	0.43	39.35	-2.51	0.00	36.84	84.90	28.50	-9.19
Apr	7	0.00	0.00	0.00	0.00	2.09	0.43	36.84	-2.51	0.00	34.33	84.90	28.50	-10.25
Apr	8	0.00	0.00	0.00	0.00	2.09	0.43	34.33	-2.51	0.00	31.81	84.90	28.50	-11.31
Apr	9	0.00	0.00	0.00	0.00	2.09	0.43	31.81	-2.51	0.00	29.30	84.90	28.50	-12.00
Apr	10	2.50	0.00	0.00	2.50	2.09	0.43	29.30	-0.01	0.00	29.29	84.90	28.50	-12.00
Apr	11	0.00	0.00	0.00	0.00	2.09	0.43	29.29	-2.51	0.00	26.77	84.90	28.50	-12.00
Apr	12	0.00	0.00	0.00	0.00	2.09	0.43	26.77	-2.51	0.00	24.26	84.90	28.50	-12.00
Apr	13	0.00	0.00	0.00	0.00	2.09	0.43	24.26	-2.51	0.00	21.75	84.90	28.50	-12.00
Apr	14	0.00	0.00	0.00	0.00	2.09	0.43	21.75	-2.51	0.00	19.24	84.90	28.50	-12.00
Apr	15	0.00	0.00	0.00	0.00	2.09	0.43	19.24	-2.51	0.00	16.72	84.90	28.50	-12.00
Apr	16	0.00	0.00	0.00	0.00	2.09	0.43	16.72	-2.51	0.00	14.21	84.90	28.50	-12.00
Apr	17	0.00	0.00	0.00	0.00	2.09	0.43	14.21	-2.51	0.00	11.70	84.90	28.50	-12.00
Apr	18	0.00	0.00	0.00	0.00	2.09	0.43	11.70	-2.51	0.00	9.19	84.90	28.50	-12.00
Apr	19	0.00	0.00	0.00	0.00	2.09	0.43	9.19	-2.51	0.00	6.67	84.90	28.50	-12.00
Apr	20	0.00	0.00	0.00	0.00	2.09	0.43	6.67	-2.51	0.00	4.16	84.90	28.50	-12.00
Apr	21	0.00	0.00	0.00	0.00	2.09	0.43	4.16	-2.51	0.00	1.65	84.90	28.50	-12.00
Apr	22	0.00	0.00	0.00	0.00	2.09	0.43	1.65	-2.51	0.00	0.00	84.90	28.50	-12.00
Apr	23	0.00	0.00	0.00	0.00	2.09	0.43	0.00	-2.51	0.00	0.00	84.90	28.50	-12.00
Apr	24	0.00	0.00	0.00	0.00	2.09	0.43	0.00	-2.51	0.00	0.00	84.90	28.50	-12.00
Apr	25	0.00	0.00	0.00	0.00	2.09	0.43	0.00	-2.51	0.00	0.00	84.90	28.50	-12.00
Apr	26	0.00	0.00	0.00	0.00	2.09	0.43	0.00	-2.51	0.00	0.00	84.90	28.50	-12.00
Apr	27	0.00	0.00	0.00	0.00	2.09	0.43	0.00	-2.51	0.00	0.00	84.90	28.50	-12.00
Apr	28	0.00	0.00	0.00	0.00	2.09	0.43	0.00	-2.51	0.00	0.00	84.90	28.50	-12.00
Apr	29	0.00	0.00	0.00	0.00	2.09	0.43	0.00	-2.51	0.00	0.00	84.90	28.50	-12.00
Apr	30	20.50	23.70	0.00	44.20	2.09	0.43	0.00	41.69	0.00	41.69	84.90	28.50	-1.40
May	1	0.00	0.00	0.00	0.00	2.46	0.43	41.69	-2.89	0.00	38.80	84.90	28.50	-2.62
May	2	0.00	0.00	0.00	0.00	2.46	0.43	38.80	-2.89	0.00	35.91	84.90	28.50	-3.83
May	3	0.00	0.00	0.00	0.00	2.46	0.43	35.91	-2.89	0.00	33.02	84.90	28.50	-5.05
May	4	0.00	0.00	0.00	0.00	2.46	0.43	33.02	-2.89	0.00	30.13	84.90	28.50	-6.27
May	5	0.00	0.00	0.00	0.00	2.46	0.43	30.13	-2.89	0.00	27.24	84.90	28.50	-7.48
May	6	0.00	0.00	0.00	0.00	2.46	0.43	27.24	-2.89	0.00	24.36	84.90	28.50	-8.70
May	7	0.00	0.00	0.00	0.00	2.46	0.43	24.36	-2.89	0.00	21.47	84.90	28.50	-9.92
May	8	0.00	0.00	0.00	0.00	2.46	0.43	21.47	-2.89	0.00	18.58	84.90	28.50	-11.13
May	9	0.00	0.00	0.00	0.00	2.46	0.43	18.58	-2.89	0.00	15.69	84.90	28.50	-12.00
May	10	0.00	0.00	0.00	0.00	2.46	0.43	15.69	-2.89	0.00	12.80	84.90	28.50	-12.00
May	11	0.00	0.00	0.00	0.00	2.46	0.43	12.80	-2.89	0.00	9.91	84.90	28.50	-12.00
May	12	0.00	0.00	0.00	0.00	2.46	0.43	9.91	-2.89	0.00	7.02	84.90	28.50	-12.00
May	13	0.00	0.00	0.00	0.00	2.46	0.43	7.02	-2.89	0.00	4.13	84.90	28.50	-12.00
May	14	0.00	0.00	0.00	0.00	2.46	0.43	4.13	-2.89	0.00	1.24	84.90	28.50	-12.00
May	15	0.00	0.00	0.00	0.00	2.46	0.43	1.24	-2.89	0.00	0.00	84.90	28.50	-12.00
May	16	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	17	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	18	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	19	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	20	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	21	7.00	1.17	0.00	8.17	2.46	0.43	0.00	5.28	0.00	5.28	84.90	28.50	-10.12
May	22	0.13	0.00	0.00	0.13	2.46	0.43	5.28	-2.76	0.00	2.52	84.90	28.50	-11.28
May	23	0.00	0.00	0.00	0.00	2.46	0.43	2.52	-2.89	0.00	0.00	84.90	28.50	-12.00
May	24	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00

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May	25	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	26	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	27	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	28	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	29	0.75	0.00	0.00	0.75	2.46	0.43	0.00	-2.14	0.00	0.00	84.90	28.50	-12.00
May	30	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	31	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
Jun	1	2.00	0.00	0.00	2.00	2.74	0.43	0.00	-1.16	0.00	0.00	84.90	28.50	-12.00
Jun	2	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	3	14.38	10.41	0.00	24.79	2.74	0.43	0.00	21.62	0.00	21.62	84.90	28.50	-5.95
Jun	4	0.00	0.00	0.00	0.00	2.74	0.43	21.62	-3.16	0.00	18.46	84.90	28.50	-7.28
Jun	5	0.00	0.00	0.00	0.00	2.74	0.43	18.46	-3.16	0.00	15.30	84.90	28.50	-8.61
Jun	6	0.00	0.00	0.00	0.00	2.74	0.43	15.30	-3.16	0.00	12.13	84.90	28.50	-9.95
Jun	7	0.00	0.00	0.00	0.00	2.74	0.43	12.13	-3.16	0.00	8.97	84.90	28.50	-11.28
Jun	8	0.00	0.00	0.00	0.00	2.74	0.43	8.97	-3.16	0.00	5.81	84.90	28.50	-12.00
Jun	9	0.00	0.00	0.00	0.00	2.74	0.43	5.81	-3.16	0.00	2.65	84.90	28.50	-12.00
Jun	10	0.00	0.00	0.00	0.00	2.74	0.43	2.65	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	11	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	12	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	13	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	14	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	15	0.38	0.00	0.00	0.38	2.74	0.43	0.00	-2.79	0.00	0.00	84.90	28.50	-12.00
Jun	16	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	17	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	18	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	19	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	20	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	21	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	22	0.25	0.00	0.00	0.25	2.74	0.43	0.00	-2.91	0.00	0.00	84.90	28.50	-12.00
Jun	23	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	24	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	25	0.50	0.00	0.00	0.50	2.74	0.43	0.00	-2.66	0.00	0.00	84.90	28.50	-12.00
Jun	26	0.38	0.00	0.00	0.38	2.74	0.43	0.00	-2.79	0.00	0.00	84.90	28.50	-12.00
Jun	27	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	28	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	29	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	30	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jul	1	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	2	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	3	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	4	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	5	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	6	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	7	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	8	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	9	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	10	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	11	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	12	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	13	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	14	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	15	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	16	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	17	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	18	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	19	0.63	0.00	0.00	0.63	2.63	0.43	0.00	-2.43	0.00	0.00	84.90	28.50	-12.00
Jul	20	24.75	35.34	0.00	60.09	2.63	0.43	0.00	57.04	0.00	57.04	84.90	28.50	0.31
Jul	21	0.00	0.00	0.00	0.00	2.63	0.43	57.04	-3.05	0.00	53.98	84.90	28.50	0.07
Jul	22	0.00	0.00	0.00	0.00	2.63	0.43	53.98	-3.05	0.00	50.93	84.90	28.50	-0.93

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Jul	23	0.00	0.00	0.00	0.00	2.63	0.43	50.93	-3.05	0.00	47.87	84.90	28.50	-2.21
Jul	24	0.00	0.00	0.00	0.00	2.63	0.43	47.87	-3.05	0.00	44.82	84.90	28.50	-3.50
Jul	25	0.00	0.00	0.00	0.00	2.63	0.43	44.82	-3.05	0.00	41.77	84.90	28.50	-4.78
Jul	26	0.00	0.00	0.00	0.00	2.63	0.43	41.77	-3.05	0.00	38.71	84.90	28.50	-6.07
Jul	27	0.00	0.00	0.00	0.00	2.63	0.43	38.71	-3.05	0.00	35.66	84.90	28.50	-7.36
Jul	28	18.13	18.02	0.00	36.15	2.63	0.43	35.66	33.09	0.00	68.75	84.90	28.50	0.25
Jul	29	6.25	0.73	0.00	6.98	2.63	0.43	68.75	3.92	0.00	72.67	84.90	28.50	0.52
Jul	30	0.00	0.00	0.00	0.00	2.63	0.43	72.67	-3.05	0.00	69.62	84.90	28.50	0.27
Jul	31	0.00	0.00	0.00	0.00	2.63	0.43	69.62	-3.05	0.00	66.56	84.90	28.50	0.03
Aug	1	2.50	0.00	0.00	2.50	2.45	0.43	66.56	-0.38	0.00	66.19	84.90	28.50	0.00
Aug	2	25.63	37.95	0.00	63.58	2.45	0.43	66.19	60.70	41.99	84.90	84.90	28.50	2.74
Aug	3	8.25	2.13	0.00	10.38	2.45	0.43	84.90	7.51	7.51	84.90	84.90	28.50	3.22
Aug	4	0.00	0.00	0.00	0.00	2.45	0.43	84.90	-2.88	0.00	82.02	84.90	28.50	2.99
Aug	5	0.00	0.00	0.00	0.00	2.45	0.43	82.02	-2.88	0.00	79.15	84.90	28.50	2.76
Aug	6	0.00	0.00	0.00	0.00	2.45	0.43	79.15	-2.88	0.00	76.27	84.90	28.50	2.53
Aug	7	0.00	0.00	0.00	0.00	2.45	0.43	76.27	-2.88	0.00	73.39	84.90	28.50	2.30
Aug	8	0.00	0.00	0.00	0.00	2.45	0.43	73.39	-2.88	0.00	70.52	84.90	28.50	2.07
Aug	9	0.00	0.00	0.00	0.00	2.45	0.43	70.52	-2.88	0.00	67.64	84.90	28.50	1.84
Aug	10	0.00	0.00	0.00	0.00	2.45	0.43	67.64	-2.88	0.00	64.76	84.90	28.50	1.61
Aug	11	0.00	0.00	0.00	0.00	2.45	0.43	64.76	-2.88	0.00	61.89	84.90	28.50	1.38
Aug	12	0.00	0.00	0.00	0.00	2.45	0.43	61.89	-2.88	0.00	59.01	84.90	28.50	1.15
Aug	13	0.00	0.00	0.00	0.00	2.45	0.43	59.01	-2.88	0.00	56.13	84.90	28.50	0.92
Aug	14	0.00	0.00	0.00	0.00	2.45	0.43	56.13	-2.88	0.00	53.26	84.90	28.50	0.69
Aug	15	0.13	0.00	0.00	0.13	2.45	0.43	53.26	-2.75	0.00	50.50	84.90	28.50	0.47
Aug	16	0.00	0.00	0.00	0.00	2.45	0.43	50.50	-2.88	0.00	47.63	84.90	28.50	0.24
Aug	17	0.00	0.00	0.00	0.00	2.45	0.43	47.63	-2.88	0.00	44.75	84.90	28.50	0.01
Aug	18	0.00	0.00	0.00	0.00	2.45	0.43	44.75	-2.88	0.00	41.87	84.90	28.50	-1.16
Aug	19	0.00	0.00	0.00	0.00	2.45	0.43	41.87	-2.88	0.00	39.00	84.90	28.50	-2.37
Aug	20	0.00	0.00	0.00	0.00	2.45	0.43	39.00	-2.88	0.00	36.12	84.90	28.50	-3.58
Aug	21	0.00	0.00	0.00	0.00	2.45	0.43	36.12	-2.88	0.00	33.24	84.90	28.50	-4.79
Aug	22	0.00	0.00	0.00	0.00	2.45	0.43	33.24	-2.88	0.00	30.37	84.90	28.50	-6.01
Aug	23	0.00	0.00	0.00	0.00	2.45	0.43	30.37	-2.88	0.00	27.49	84.90	28.50	-7.22
Aug	24	0.00	0.00	0.00	0.00	2.45	0.43	27.49	-2.88	0.00	24.61	84.90	28.50	-8.43
Aug	25	0.00	0.00	0.00	0.00	2.45	0.43	24.61	-2.88	0.00	21.74	84.90	28.50	-9.64
Aug	26	0.00	0.00	0.00	0.00	2.45	0.43	21.74	-2.88	0.00	18.86	84.90	28.50	-10.85
Aug	27	0.00	0.00	0.00	0.00	2.45	0.43	18.86	-2.88	0.00	15.98	84.90	28.50	-12.00
Aug	28	0.00	0.00	0.00	0.00	2.45	0.43	15.98	-2.88	0.00	13.10	84.90	28.50	-12.00
Aug	29	0.00	0.00	0.00	0.00	2.45	0.43	13.10	-2.88	0.00	10.23	84.90	28.50	-12.00
Aug	30	0.00	0.00	0.00	0.00	2.45	0.43	10.23	-2.88	0.00	7.35	84.90	28.50	-12.00
Aug	31	0.00	0.00	0.00	0.00	2.45	0.43	7.35	-2.88	0.00	4.47	84.90	28.50	-12.00
Sep	1	0.00	0.00	0.00	0.00	2.32	0.43	4.47	-2.75	0.00	1.73	84.90	28.50	-12.00
Sep	2	0.25	0.00	0.00	0.25	2.32	0.43	1.73	-2.50	0.00	0.00	84.90	28.50	-12.00
Sep	3	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	4	2.25	0.00	0.00	2.25	2.32	0.43	0.00	-0.50	0.00	0.00	84.90	28.50	-12.00
Sep	5	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	6	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	7	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	8	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	9	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	10	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	11	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	12	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	13	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	14	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	15	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	16	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	17	3.75	0.01	0.00	3.76	2.32	0.43	0.00	1.01	0.00	1.01	84.90	28.50	-11.58
Sep	18	0.13	0.00	0.00	0.13	2.32	0.43	1.01	-2.62	0.00	0.00	84.90	28.50	-12.00
Sep	19	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00

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Sep	20	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	21	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	22	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	23	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	24	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	25	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	26	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	27	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	28	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	29	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	30	15.88	13.24	0.00	29.12	2.32	0.43	0.00	26.37	0.00	26.37	84.90	28.50	-4.78
Oct	1	0.00	0.00	0.00	0.00	1.73	0.43	26.37	-2.15	0.00	24.22	84.90	28.50	-5.69
Oct	2	0.00	0.00	0.00	0.00	1.73	0.43	24.22	-2.15	0.00	22.07	84.90	28.50	-6.59
Oct	3	0.00	0.00	0.00	0.00	1.73	0.43	22.07	-2.15	0.00	19.92	84.90	28.50	-7.50
Oct	4	0.00	0.00	0.00	0.00	1.73	0.43	19.92	-2.15	0.00	17.77	84.90	28.50	-8.40
Oct	5	0.00	0.00	0.00	0.00	1.73	0.43	17.77	-2.15	0.00	15.62	84.90	28.50	-9.31
Oct	6	0.00	0.00	0.00	0.00	1.73	0.43	15.62	-2.15	0.00	13.47	84.90	28.50	-10.22
Oct	7	0.00	0.00	0.00	0.00	1.73	0.43	13.47	-2.15	0.00	11.32	84.90	28.50	-11.12
Oct	8	0.00	0.00	0.00	0.00	1.73	0.43	11.32	-2.15	0.00	9.17	84.90	28.50	-12.00
Oct	9	0.00	0.00	0.00	0.00	1.73	0.43	9.17	-2.15	0.00	7.01	84.90	28.50	-12.00
Oct	10	0.00	0.00	0.00	0.00	1.73	0.43	7.01	-2.15	0.00	4.86	84.90	28.50	-12.00
Oct	11	0.00	0.00	0.00	0.00	1.73	0.43	4.86	-2.15	0.00	2.71	84.90	28.50	-12.00
Oct	12	0.00	0.00	0.00	0.00	1.73	0.43	2.71	-2.15	0.00	0.56	84.90	28.50	-12.00
Oct	13	0.00	0.00	0.00	0.00	1.73	0.43	0.56	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	14	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	15	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	16	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	17	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	18	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	19	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	20	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	21	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	22	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	23	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	24	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	25	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	26	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	27	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	28	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	29	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	30	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	31	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Nov	1	9.00	2.84	0.00	11.84	1.21	0.44	0.00	10.19	0.00	10.19	84.90	28.50	-8.54
Nov	2	0.00	0.00	0.00	0.00	1.21	0.44	10.19	-1.65	0.00	8.54	84.90	28.50	-9.24
Nov	3	0.00	0.00	0.00	0.00	1.21	0.44	8.54	-1.65	0.00	6.89	84.90	28.50	-9.93
Nov	4	0.00	0.00	0.00	0.00	1.21	0.44	6.89	-1.65	0.00	5.25	84.90	28.50	-10.62
Nov	5	0.00	0.00	0.00	0.00	1.21	0.44	5.25	-1.65	0.00	3.60	84.90	28.50	-11.32
Nov	6	0.00	0.00	0.00	0.00	1.21	0.44	3.60	-1.65	0.00	1.95	84.90	28.50	-12.00
Nov	7	0.38	0.00	0.00	0.38	1.21	0.44	1.95	-1.27	0.00	0.68	84.90	28.50	-12.00
Nov	8	0.00	0.00	0.00	0.00	1.21	0.44	0.68	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	9	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	10	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	11	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	12	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	13	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	14	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	15	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	16	2.38	0.00	0.00	2.38	1.21	0.44	0.00	0.73	0.00	0.73	84.90	28.50	-11.69
Nov	17	0.00	0.00	0.00	0.00	1.21	0.44	0.73	-1.65	0.00	0.00	84.90	28.50	-12.00

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Nov	18	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	19	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	20	3.00	0.00	0.00	3.00	1.21	0.44	0.00	1.35	0.00	1.35	84.90	28.50	-11.43
Nov	21	0.00	0.00	0.00	0.00	1.21	0.44	1.35	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	22	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	23	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	24	0.13	0.00	0.00	0.13	1.21	0.44	0.00	-1.52	0.00	0.00	84.90	28.50	-12.00
Nov	25	0.38	0.00	0.00	0.38	1.21	0.44	0.00	-1.27	0.00	0.00	84.90	28.50	-12.00
Nov	26	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	27	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	28	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	29	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Nov	30	0.00	0.00	0.00	0.00	1.21	0.44	0.00	-1.65	0.00	0.00	84.90	28.50	-12.00
Dec	1	0.00	0.00	0.00	0.00	0.95	0.41	0.00	-1.36	0.00	0.00	84.90	28.50	-12.00
Dec	2	0.00	0.00	0.00	0.00	0.95	0.41	0.00	-1.36	0.00	0.00	84.90	28.50	-12.00
Dec	3	0.00	0.00	0.00	0.00	0.95	0.41	0.00	-1.36	0.00	0.00	84.90	28.50	-12.00
Dec	4	0.00	0.00	0.00	0.00	0.95	0.41	0.00	-1.36	0.00	0.00	84.90	28.50	-12.00
Dec	5	0.00	0.00	0.00	0.00	0.95	0.41	0.00	-1.36	0.00	0.00	84.90	28.50	-12.00
Dec	6	0.00	0.00	0.00	0.00	0.95	0.41	0.00	-1.36	0.00	0.00	84.90	28.50	-12.00
Dec	7	0.00	0.00	0.00	0.00	0.95	0.41	0.00	-1.36	0.00	0.00	84.90	28.50	-12.00
Dec	8	15.63	12.75	0.00	28.38	0.95	0.41	0.00	27.02	0.00	27.02	84.90	28.50	-4.37
Dec	9	7.00	1.17	0.00	8.17	0.95	0.41	27.02	6.81	0.00	33.83	84.90	28.50	-1.84
Dec	10	0.13	0.00	0.00	0.13	0.95	0.41	33.83	-1.23	0.00	32.60	84.90	28.50	-2.36
Dec	11	4.38	0.07	0.00	4.45	0.95	0.41	32.60	3.09	0.00	35.69	84.90	28.50	-1.08
Dec	12	0.00	0.00	0.00	0.00	0.95	0.41	35.69	-1.36	0.00	34.33	84.90	28.50	-1.65
Dec	13	0.00	0.00	0.00	0.00	0.95	0.41	34.33	-1.36	0.00	32.97	84.90	28.50	-2.23
Dec	14	0.00	0.00	0.00	0.00	0.95	0.41	32.97	-1.36	0.00	31.61	84.90	28.50	-2.80
Dec	15	0.00	0.00	0.00	0.00	0.95	0.41	31.61	-1.36	0.00	30.25	84.90	28.50	-3.37
Dec	16	0.00	0.00	0.00	0.00	0.95	0.41	30.25	-1.36	0.00	28.89	84.90	28.50	-3.94
Dec	17	0.00	0.00	0.00	0.00	0.95	0.41	28.89	-1.36	0.00	27.53	84.90	28.50	-4.51
Dec	18	0.00	0.00	0.00	0.00	0.95	0.41	27.53	-1.36	0.00	26.17	84.90	28.50	-5.09
Dec	19	0.00	0.00	0.00	0.00	0.95	0.41	26.17	-1.36	0.00	24.81	84.90	28.50	-5.66
Dec	20	0.00	0.00	0.00	0.00	0.95	0.41	24.81	-1.36	0.00	23.45	84.90	28.50	-6.23
Dec	21	0.00	0.00	0.00	0.00	0.95	0.41	23.45	-1.36	0.00	22.10	84.90	28.50	-6.80
Dec	22	0.00	0.00	0.00	0.00	0.95	0.41	22.10	-1.36	0.00	20.74	84.90	28.50	-7.38
Dec	23	1.88	0.00	0.00	1.88	0.95	0.41	20.74	0.52	0.00	21.25	84.90	28.50	-7.16
Dec	24	0.00	0.00	0.00	0.00	0.95	0.41	21.25	-1.36	0.00	19.89	84.90	28.50	-7.73
Dec	25	0.00	0.00	0.00	0.00	0.95	0.41	19.89	-1.36	0.00	18.53	84.90	28.50	-8.30
Dec	26	0.00	0.00	0.00	0.00	0.95	0.41	18.53	-1.36	0.00	17.18	84.90	28.50	-8.88
Dec	27	0.00	0.00	0.00	0.00	0.95	0.41	17.18	-1.36	0.00	15.82	84.90	28.50	-9.45
Dec	28	7.38	1.43	0.00	8.81	0.95	0.41	15.82	7.45	0.00	23.27	84.90	28.50	-6.73
Dec	29	0.00	0.00	0.00	0.00	0.95	0.41	23.27	-1.36	0.00	21.91	84.90	28.50	-7.30
Dec	30	0.75	0.00	0.00	0.75	0.95	0.41	21.91	-0.61	0.00	21.30	84.90	28.50	-7.56
Dec	31	1.13	0.00	0.00	1.13	0.95	0.41	21.30	-0.23	0.00	21.06	84.90	28.50	-7.66

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AVG YEAR
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Month	Day	INPUTS				OUTPUTS		WETLAND VOLUME CHANGE						
		Direct Precipitation	Runoff	Baseflow	Total Water Input	PET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume	Maximum	Saturation	#VALUE!
		(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	#VALUE!
											50.00			**3.763359928**
Jan	1	9.25	3.09	0.00	12.34	0.95	0.43	50.00	10.97	0.00	60.97	84.90	28.50	2.19
Jan	2	1.25	0.00	0.00	1.25	0.95	0.43	60.97	-0.13	0.00	60.84	84.90	28.50	2.18
Jan	3	6.00	0.60	0.00	6.60	0.95	0.43	60.84	5.23	0.00	66.06	84.90	28.50	2.56
Jan	4	0.00	0.00	0.00	0.00	0.95	0.43	66.06	-1.38	0.00	64.69	84.90	28.50	2.45
Jan	5	0.00	0.00	0.00	0.00	0.95	0.43	64.69	-1.38	0.00	63.31	84.90	28.50	2.34

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Jan	6	0.00	0.00	0.00	0.00	0.95	0.43	63.31	-1.38	0.00	61.93	84.90	28.50	2.23
Jan	7	0.00	0.00	0.00	0.00	0.95	0.43	61.93	-1.38	0.00	60.56	84.90	28.50	2.12
Jan	8	0.00	0.00	0.00	0.00	0.95	0.43	60.56	-1.38	0.00	59.18	84.90	28.50	2.01
Jan	9	0.00	0.00	0.00	0.00	0.95	0.43	59.18	-1.38	0.00	57.80	84.90	28.50	1.90
Jan	10	0.13	0.00	0.00	0.13	0.95	0.43	57.80	-1.25	0.00	56.55	84.90	28.50	1.80
Jan	11	1.00	0.00	0.00	1.00	0.95	0.43	56.55	-0.38	0.00	56.18	84.90	28.50	1.77
Jan	12	0.00	0.00	0.00	0.00	0.95	0.43	56.18	-1.38	0.00	54.80	84.90	28.50	1.66
Jan	13	0.00	0.00	0.00	0.00	0.95	0.43	54.80	-1.38	0.00	53.42	84.90	28.50	1.55
Jan	14	4.00	0.02	0.00	4.02	0.95	0.43	53.42	2.65	0.00	56.07	84.90	28.50	1.76
Jan	15	0.00	0.00	0.00	0.00	0.95	0.43	56.07	-1.38	0.00	54.69	84.90	28.50	1.65
Jan	16	0.38	0.00	0.00	0.38	0.95	0.43	54.69	-1.00	0.00	53.69	84.90	28.50	1.57
Jan	17	3.75	0.01	0.00	3.76	0.95	0.43	53.69	2.38	0.00	56.07	84.90	28.50	1.76
Jan	18	0.50	0.00	0.00	0.50	0.95	0.43	56.07	-0.88	0.00	55.19	84.90	28.50	1.69
Jan	19	0.00	0.00	0.00	0.00	0.95	0.43	55.19	-1.38	0.00	53.81	84.90	28.50	1.58
Jan	20	0.00	0.00	0.00	0.00	0.95	0.43	53.81	-1.38	0.00	52.44	84.90	28.50	1.47
Jan	21	0.00	0.00	0.00	0.00	0.95	0.43	52.44	-1.38	0.00	51.06	84.90	28.50	1.36
Jan	22	0.00	0.00	0.00	0.00	0.95	0.43	51.06	-1.38	0.00	49.68	84.90	28.50	1.25
Jan	23	0.00	0.00	0.00	0.00	0.95	0.43	49.68	-1.38	0.00	48.31	84.90	28.50	1.14
Jan	24	0.25	0.00	0.00	0.25	0.95	0.43	48.31	-1.13	0.00	47.18	84.90	28.50	1.05
Jan	25	0.00	0.00	0.00	0.00	0.95	0.43	47.18	-1.38	0.00	45.80	84.90	28.50	0.94
Jan	26	0.00	0.00	0.00	0.00	0.95	0.43	45.80	-1.38	0.00	44.43	84.90	28.50	0.83
Jan	27	2.50	0.00	0.00	2.50	0.95	0.43	44.43	1.12	0.00	45.55	84.90	28.50	0.92
Jan	28	1.63	0.00	0.00	1.63	0.95	0.43	45.55	0.25	0.00	45.80	84.90	28.50	0.94
Jan	29	0.00	0.00	0.00	0.00	0.95	0.43	45.80	-1.38	0.00	44.42	84.90	28.50	0.83
Jan	30	0.25	0.00	0.00	0.25	0.95	0.43	44.42	-1.13	0.00	43.29	84.90	28.50	0.74
Jan	31	0.13	0.00	0.00	0.13	0.95	0.43	43.29	-1.25	0.00	42.04	84.90	28.50	0.64
Feb	1	0.63	0.00	0.00	0.63	1.26	0.43	42.04	-1.06	0.00	40.98	84.90	28.50	0.55
Feb	2	0.38	0.00	0.00	0.38	1.26	0.43	40.98	-1.31	0.00	39.66	84.90	28.50	0.45
Feb	3	0.00	0.00	0.00	0.00	1.26	0.43	39.66	-1.69	0.00	37.98	84.90	28.50	0.31
Feb	4	0.00	0.00	0.00	0.00	1.26	0.43	37.98	-1.69	0.00	36.29	84.90	28.50	0.18
Feb	5	1.50	0.00	0.00	1.50	1.26	0.43	36.29	-0.19	0.00	36.10	84.90	28.50	0.16
Feb	6	0.00	0.00	0.00	0.00	1.26	0.43	36.10	-1.69	0.00	34.41	84.90	28.50	0.03
Feb	7	0.00	0.00	0.00	0.00	1.26	0.43	34.41	-1.69	0.00	32.72	84.90	28.50	-0.56
Feb	8	0.00	0.00	0.00	0.00	1.26	0.43	32.72	-1.69	0.00	31.03	84.90	28.50	-1.27
Feb	9	0.00	0.00	0.00	0.00	1.26	0.43	31.03	-1.69	0.00	29.34	84.90	28.50	-1.98
Feb	10	0.25	0.00	0.00	0.25	1.26	0.43	29.34	-1.44	0.00	27.91	84.90	28.50	-2.59
Feb	11	29.88	51.59	0.00	81.46	1.26	0.43	27.91	79.78	22.78	84.90	84.90	28.50	3.01
Feb	12	0.00	0.00	0.00	0.00	1.26	0.43	84.90	-1.69	0.00	83.21	84.90	28.50	2.88
Feb	13	0.00	0.00	0.00	0.00	1.26	0.43	83.21	-1.69	0.00	81.52	84.90	28.50	2.74
Feb	14	0.00	0.00	0.00	0.00	1.26	0.43	81.52	-1.69	0.00	79.83	84.90	28.50	2.61
Feb	15	0.00	0.00	0.00	0.00	1.26	0.43	79.83	-1.69	0.00	78.15	84.90	28.50	2.47
Feb	16	0.00	0.00	0.00	0.00	1.26	0.43	78.15	-1.69	0.00	76.46	84.90	28.50	2.34
Feb	17	0.00	0.00	0.00	0.00	1.26	0.43	76.46	-1.69	0.00	74.77	84.90	28.50	2.20
Feb	18	0.00	0.00	0.00	0.00	1.26	0.43	74.77	-1.69	0.00	73.08	84.90	28.50	2.07
Feb	19	0.00	0.00	0.00	0.00	1.26	0.43	73.08	-1.69	0.00	71.39	84.90	28.50	1.93
Feb	20	0.00	0.00	0.00	0.00	1.26	0.43	71.39	-1.69	0.00	69.70	84.90	28.50	1.80
Feb	21	0.00	0.00	0.00	0.00	1.26	0.43	69.70	-1.69	0.00	68.01	84.90	28.50	1.66
Feb	22	0.00	0.00	0.00	0.00	1.26	0.43	68.01	-1.69	0.00	66.33	84.90	28.50	1.53
Feb	23	1.75	0.00	0.00	1.75	1.26	0.43	66.33	0.06	0.00	66.39	84.90	28.50	1.53
Feb	24	19.75	21.84	0.00	41.59	1.26	0.43	66.39	39.90	21.39	84.90	84.90	28.50	3.51
Feb	25	3.88	0.01	0.00	3.89	1.26	0.43	84.90	2.20	2.20	84.90	84.90	28.50	3.68
Feb	26	0.00	0.00	0.00	0.00	1.26	0.43	84.90	-1.69	0.00	83.21	84.90	28.50	3.55
Feb	27	3.38	0.00	0.00	3.38	1.26	0.43	83.21	1.69	0.00	84.90	84.90	28.50	3.68
Feb	28	0.63	0.00	0.00	0.63	1.26	0.43	84.90	-1.06	0.00	83.83	84.90	28.50	3.60
Mar	1	13.88	9.53	0.00	23.41	1.74	0.43	83.83	21.24	20.17	84.90	84.90	28.50	4.00
Mar	2	0.00	0.00	0.00	0.00	1.74	0.43	84.90	-2.17	0.00	82.73	84.90	28.50	3.83
Mar	3	0.00	0.00	0.00	0.00	1.74	0.43	82.73	-2.17	0.00	80.57	84.90	28.50	3.65
Mar	4	0.00	0.00	0.00	0.00	1.74	0.43	80.57	-2.17	0.00	78.40	84.90	28.50	3.48
Mar	5	0.00	0.00	0.00	0.00	1.74	0.43	78.40	-2.17	0.00	76.23	84.90	28.50	3.31

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Mar	6	0.00	0.00	0.00	0.00	1.74	0.43	76.23	-2.17	0.00	74.06	84.90	28.50	3.13
Mar	7	0.00	0.00	0.00	0.00	1.74	0.43	74.06	-2.17	0.00	71.90	84.90	28.50	2.96
Mar	8	0.00	0.00	0.00	0.00	1.74	0.43	71.90	-2.17	0.00	69.73	84.90	28.50	2.79
Mar	9	0.00	0.00	0.00	0.00	1.74	0.43	69.73	-2.17	0.00	67.56	84.90	28.50	2.61
Mar	10	0.00	0.00	0.00	0.00	1.74	0.43	67.56	-2.17	0.00	65.40	84.90	28.50	2.44
Mar	11	0.00	0.00	0.00	0.00	1.74	0.43	65.40	-2.17	0.00	63.23	84.90	28.50	2.27
Mar	12	0.00	0.00	0.00	0.00	1.74	0.43	63.23	-2.17	0.00	61.06	84.90	28.50	2.09
Mar	13	0.00	0.00	0.00	0.00	1.74	0.43	61.06	-2.17	0.00	58.89	84.90	28.50	1.92
Mar	14	0.00	0.00	0.00	0.00	1.74	0.43	58.89	-2.17	0.00	56.73	84.90	28.50	1.75
Mar	15	13.50	8.89	0.00	22.39	1.74	0.43	56.73	20.23	0.00	76.95	84.90	28.50	2.87
Mar	16	2.88	0.00	0.00	2.88	1.74	0.43	76.95	0.71	0.00	77.66	84.90	28.50	2.93
Mar	17	0.75	0.00	0.00	0.75	1.74	0.43	77.66	-1.42	0.00	76.25	84.90	28.50	2.81
Mar	18	0.00	0.00	0.00	0.00	1.74	0.43	76.25	-2.17	0.00	74.08	84.90	28.50	2.64
Mar	19	0.00	0.00	0.00	0.00	1.74	0.43	74.08	-2.17	0.00	71.91	84.90	28.50	2.47
Mar	20	22.75	29.64	0.00	52.39	1.74	0.43	71.91	50.22	37.23	84.90	84.90	28.50	4.00
Mar	21	0.75	0.00	0.00	0.75	1.74	0.43	84.90	-1.42	0.00	83.48	84.90	28.50	3.89
Mar	22	0.00	0.00	0.00	0.00	1.74	0.43	83.48	-2.17	0.00	81.32	84.90	28.50	3.71
Mar	23	0.00	0.00	0.00	0.00	1.74	0.43	81.32	-2.17	0.00	79.15	84.90	28.50	3.54
Mar	24	0.00	0.00	0.00	0.00	1.74	0.43	79.15	-2.17	0.00	76.98	84.90	28.50	3.37
Mar	25	0.00	0.00	0.00	0.00	1.74	0.43	76.98	-2.17	0.00	74.81	84.90	28.50	3.19
Mar	26	0.00	0.00	0.00	0.00	1.74	0.43	74.81	-2.17	0.00	72.65	84.90	28.50	3.02
Mar	27	0.00	0.00	0.00	0.00	1.74	0.43	72.65	-2.17	0.00	70.48	84.90	28.50	2.85
Mar	28	0.00	0.00	0.00	0.00	1.74	0.43	70.48	-2.17	0.00	68.31	84.90	28.50	2.67
Mar	29	0.00	0.00	0.00	0.00	1.74	0.43	68.31	-2.17	0.00	66.15	84.90	28.50	2.50
Mar	30	0.00	0.00	0.00	0.00	1.74	0.43	66.15	-2.17	0.00	63.98	84.90	28.50	2.33
Mar	31	3.63	0.00	0.00	3.63	1.74	0.43	63.98	1.46	0.00	65.44	84.90	28.50	2.44
Apr	1	0.00	0.00	0.00	0.00	2.09	0.43	65.44	-2.51	0.00	62.92	84.90	28.50	2.24
Apr	2	0.75	0.00	0.00	0.75	2.09	0.43	62.92	-1.76	0.00	61.16	84.90	28.50	2.10
Apr	3	0.00	0.00	0.00	0.00	2.09	0.43	61.16	-2.51	0.00	58.65	84.90	28.50	1.90
Apr	4	0.00	0.00	0.00	0.00	2.09	0.43	58.65	-2.51	0.00	56.14	84.90	28.50	1.70
Apr	5	0.00	0.00	0.00	0.00	2.09	0.43	56.14	-2.51	0.00	53.62	84.90	28.50	1.50
Apr	6	0.00	0.00	0.00	0.00	2.09	0.43	53.62	-2.51	0.00	51.11	84.90	28.50	1.30
Apr	7	0.00	0.00	0.00	0.00	2.09	0.43	51.11	-2.51	0.00	48.60	84.90	28.50	1.10
Apr	8	0.00	0.00	0.00	0.00	2.09	0.43	48.60	-2.51	0.00	46.09	84.90	28.50	0.89
Apr	9	0.00	0.00	0.00	0.00	2.09	0.43	46.09	-2.51	0.00	43.57	84.90	28.50	0.69
Apr	10	0.00	0.00	0.00	0.00	2.09	0.43	43.57	-2.51	0.00	41.06	84.90	28.50	0.49
Apr	11	0.75	0.00	0.00	0.75	2.09	0.43	41.06	-1.76	0.00	39.30	84.90	28.50	0.35
Apr	12	1.63	0.00	0.00	1.63	2.09	0.43	39.30	-0.89	0.00	38.41	84.90	28.50	0.28
Apr	13	0.00	0.00	0.00	0.00	2.09	0.43	38.41	-2.51	0.00	35.90	84.90	28.50	0.08
Apr	14	0.00	0.00	0.00	0.00	2.09	0.43	35.90	-2.51	0.00	33.38	84.90	28.50	-0.64
Apr	15	0.00	0.00	0.00	0.00	2.09	0.43	33.38	-2.51	0.00	30.87	84.90	28.50	-1.70
Apr	16	0.00	0.00	0.00	0.00	2.09	0.43	30.87	-2.51	0.00	28.36	84.90	28.50	-2.75
Apr	17	0.00	0.00	0.00	0.00	2.09	0.43	28.36	-2.51	0.00	25.85	84.90	28.50	-3.81
Apr	18	0.00	0.00	0.00	0.00	2.09	0.43	25.85	-2.51	0.00	23.33	84.90	28.50	-4.87
Apr	19	0.00	0.00	0.00	0.00	2.09	0.43	23.33	-2.51	0.00	20.82	84.90	28.50	-5.93
Apr	20	0.00	0.00	0.00	0.00	2.09	0.43	20.82	-2.51	0.00	18.31	84.90	28.50	-6.99
Apr	21	13.38	8.69	0.00	22.06	2.09	0.43	18.31	19.55	0.00	37.86	84.90	28.50	-1.30
Apr	22	0.00	0.00	0.00	0.00	2.09	0.43	37.86	-2.51	0.00	35.34	84.90	28.50	-2.36
Apr	23	0.75	0.00	0.00	0.75	2.09	0.43	35.34	-1.76	0.00	33.58	84.90	28.50	-3.10
Apr	24	0.00	0.00	0.00	0.00	2.09	0.43	33.58	-2.51	0.00	31.07	84.90	28.50	-4.16
Apr	25	0.00	0.00	0.00	0.00	2.09	0.43	31.07	-2.51	0.00	28.56	84.90	28.50	-5.22
Apr	26	11.88	6.36	0.00	18.24	2.09	0.43	28.56	15.72	0.00	44.28	84.90	28.50	-0.47
Apr	27	0.00	0.00	0.00	0.00	2.09	0.43	44.28	-2.51	0.00	41.77	84.90	28.50	-1.52
Apr	28	0.00	0.00	0.00	0.00	2.09	0.43	41.77	-2.51	0.00	39.25	84.90	28.50	-2.58
Apr	29	0.00	0.00	0.00	0.00	2.09	0.43	39.25	-2.51	0.00	36.74	84.90	28.50	-3.64
Apr	30	0.00	0.00	0.00	0.00	2.09	0.43	36.74	-2.51	0.00	34.23	84.90	28.50	-4.70
May	1	0.00	0.00	0.00	0.00	2.46	0.43	34.23	-2.89	0.00	31.34	84.90	28.50	-5.91
May	2	0.00	0.00	0.00	0.00	2.46	0.43	31.34	-2.89	0.00	28.45	84.90	28.50	-7.13
May	3	0.00	0.00	0.00	0.00	2.46	0.43	28.45	-2.89	0.00	25.56	84.90	28.50	-8.35

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May	4	0.00	0.00	0.00	0.00	2.46	0.43	25.56	-2.89	0.00	22.67	84.90	28.50	-9.56
May	5	0.00	0.00	0.00	0.00	2.46	0.43	22.67	-2.89	0.00	19.78	84.90	28.50	-10.78
May	6	0.00	0.00	0.00	0.00	2.46	0.43	19.78	-2.89	0.00	16.89	84.90	28.50	-12.00
May	7	0.00	0.00	0.00	0.00	2.46	0.43	16.89	-2.89	0.00	14.01	84.90	28.50	-12.00
May	8	0.00	0.00	0.00	0.00	2.46	0.43	14.01	-2.89	0.00	11.12	84.90	28.50	-12.00
May	9	0.00	0.00	0.00	0.00	2.46	0.43	11.12	-2.89	0.00	8.23	84.90	28.50	-12.00
May	10	0.00	0.00	0.00	0.00	2.46	0.43	8.23	-2.89	0.00	5.34	84.90	28.50	-12.00
May	11	0.00	0.00	0.00	0.00	2.46	0.43	5.34	-2.89	0.00	2.45	84.90	28.50	-12.00
May	12	0.00	0.00	0.00	0.00	2.46	0.43	2.45	-2.89	0.00	0.00	84.90	28.50	-12.00
May	13	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	14	1.00	0.00	0.00	1.00	2.46	0.43	0.00	-1.89	0.00	0.00	84.90	28.50	-12.00
May	15	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	16	0.13	0.00	0.00	0.13	2.46	0.43	0.00	-2.76	0.00	0.00	84.90	28.50	-12.00
May	17	1.50	0.00	0.00	1.50	2.46	0.43	0.00	-1.39	0.00	0.00	84.90	28.50	-12.00
May	18	0.63	0.00	0.00	0.63	2.46	0.43	0.00	-2.26	0.00	0.00	84.90	28.50	-12.00
May	19	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	20	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	21	3.13	0.00	0.00	3.13	2.46	0.43	0.00	0.24	0.00	0.24	84.90	28.50	-11.90
May	22	0.50	0.00	0.00	0.50	2.46	0.43	0.24	-2.39	0.00	0.00	84.90	28.50	-12.00
May	23	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	24	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	25	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	26	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	27	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	28	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	29	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	30	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
May	31	0.00	0.00	0.00	0.00	2.46	0.43	0.00	-2.89	0.00	0.00	84.90	28.50	-12.00
Jun	1	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	2	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	3	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	4	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	5	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	6	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	7	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	8	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	9	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	10	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	11	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	12	9.88	3.77	0.00	13.65	2.74	0.43	0.00	10.49	0.00	10.49	84.90	28.50	-8.69
Jun	13	0.00	0.00	0.00	0.00	2.74	0.43	10.49	-3.16	0.00	7.32	84.90	28.50	-10.02
Jun	14	0.00	0.00	0.00	0.00	2.74	0.43	7.32	-3.16	0.00	4.16	84.90	28.50	-11.36
Jun	15	0.00	0.00	0.00	0.00	2.74	0.43	4.16	-3.16	0.00	1.00	84.90	28.50	-12.00
Jun	16	0.00	0.00	0.00	0.00	2.74	0.43	1.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	17	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	18	0.00	0.00	0.00	0.00	2.74	0.43	0.00	-3.16	0.00	0.00	84.90	28.50	-12.00
Jun	19	40.38	91.03	0.00	131.41	2.74	0.43	0.00	128.25	43.35	84.90	84.90	28.50	2.90
Jun	20	6.75	1.01	0.00	7.76	2.74	0.43	84.90	4.60	4.60	84.90	84.90	28.50	3.22
Jun	21	0.25	0.00	0.00	0.25	2.74	0.43	84.90	-2.91	0.00	81.99	84.90	28.50	2.98
Jun	22	0.00	0.00	0.00	0.00	2.74	0.43	81.99	-3.16	0.00	78.82	84.90	28.50	2.73
Jun	23	0.00	0.00	0.00	0.00	2.74	0.43	78.82	-3.16	0.00	75.66	84.90	28.50	2.48
Jun	24	0.00	0.00	0.00	0.00	2.74	0.43	75.66	-3.16	0.00	72.50	84.90	28.50	2.22
Jun	25	0.00	0.00	0.00	0.00	2.74	0.43	72.50	-3.16	0.00	69.34	84.90	28.50	1.97
Jun	26	0.00	0.00	0.00	0.00	2.74	0.43	69.34	-3.16	0.00	66.17	84.90	28.50	1.72
Jun	27	0.00	0.00	0.00	0.00	2.74	0.43	66.17	-3.16	0.00	63.01	84.90	28.50	1.47
Jun	28	0.00	0.00	0.00	0.00	2.74	0.43	63.01	-3.16	0.00	59.85	84.90	28.50	1.21
Jun	29	0.00	0.00	0.00	0.00	2.74	0.43	59.85	-3.16	0.00	56.69	84.90	28.50	0.96
Jun	30	0.00	0.00	0.00	0.00	2.74	0.43	56.69	-3.16	0.00	53.52	84.90	28.50	0.71
Jul	1	0.00	0.00	0.00	0.00	2.63	0.43	53.52	-3.05	0.00	50.47	84.90	28.50	0.46

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Jul	2	0.00	0.00	0.00	0.00	2.63	0.43	50.47	-3.05	0.00	47.41	84.90	28.50	0.22
Jul	3	0.00	0.00	0.00	0.00	2.63	0.43	47.41	-3.05	0.00	44.36	84.90	28.50	-0.14
Jul	4	12.75	7.68	0.00	20.43	2.63	0.43	44.36	17.37	0.00	61.73	84.90	28.50	0.94
Jul	5	3.75	0.01	0.00	3.76	2.63	0.43	61.73	0.70	0.00	62.44	84.90	28.50	0.99
Jul	6	0.00	0.00	0.00	0.00	2.63	0.43	62.44	-3.05	0.00	59.38	84.90	28.50	0.75
Jul	7	0.00	0.00	0.00	0.00	2.63	0.43	59.38	-3.05	0.00	56.33	84.90	28.50	0.50
Jul	8	0.00	0.00	0.00	0.00	2.63	0.43	56.33	-3.05	0.00	53.27	84.90	28.50	0.26
Jul	9	0.00	0.00	0.00	0.00	2.63	0.43	53.27	-3.05	0.00	50.22	84.90	28.50	0.01
Jul	10	0.00	0.00	0.00	0.00	2.63	0.43	50.22	-3.05	0.00	47.16	84.90	28.50	-1.21
Jul	11	0.00	0.00	0.00	0.00	2.63	0.43	47.16	-3.05	0.00	44.11	84.90	28.50	-2.50
Jul	12	0.00	0.00	0.00	0.00	2.63	0.43	44.11	-3.05	0.00	41.06	84.90	28.50	-3.79
Jul	13	0.00	0.00	0.00	0.00	2.63	0.43	41.06	-3.05	0.00	38.00	84.90	28.50	-5.07
Jul	14	0.00	0.00	0.00	0.00	2.63	0.43	38.00	-3.05	0.00	34.95	84.90	28.50	-6.36
Jul	15	0.00	0.00	0.00	0.00	2.63	0.43	34.95	-3.05	0.00	31.89	84.90	28.50	-7.64
Jul	16	0.00	0.00	0.00	0.00	2.63	0.43	31.89	-3.05	0.00	28.84	84.90	28.50	-8.93
Jul	17	0.00	0.00	0.00	0.00	2.63	0.43	28.84	-3.05	0.00	25.78	84.90	28.50	-10.22
Jul	18	0.00	0.00	0.00	0.00	2.63	0.43	25.78	-3.05	0.00	22.73	84.90	28.50	-11.50
Jul	19	0.13	0.00	0.00	0.13	2.63	0.43	22.73	-2.93	0.00	19.80	84.90	28.50	-12.00
Jul	20	0.00	0.00	0.00	0.00	2.63	0.43	19.80	-3.05	0.00	16.75	84.90	28.50	-12.00
Jul	21	0.00	0.00	0.00	0.00	2.63	0.43	16.75	-3.05	0.00	13.69	84.90	28.50	-12.00
Jul	22	0.00	0.00	0.00	0.00	2.63	0.43	13.69	-3.05	0.00	10.64	84.90	28.50	-12.00
Jul	23	0.00	0.00	0.00	0.00	2.63	0.43	10.64	-3.05	0.00	7.58	84.90	28.50	-12.00
Jul	24	0.00	0.00	0.00	0.00	2.63	0.43	7.58	-3.05	0.00	4.53	84.90	28.50	-12.00
Jul	25	0.00	0.00	0.00	0.00	2.63	0.43	4.53	-3.05	0.00	1.48	84.90	28.50	-12.00
Jul	26	0.00	0.00	0.00	0.00	2.63	0.43	1.48	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	27	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	28	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	29	0.00	0.00	0.00	0.00	2.63	0.43	0.00	-3.05	0.00	0.00	84.90	28.50	-12.00
Jul	30	32.50	60.73	0.00	93.23	2.63	0.43	0.00	90.18	5.28	84.90	84.90	28.50	1.55
Jul	31	0.00	0.00	0.00	0.00	2.63	0.43	84.90	-3.05	0.00	81.85	84.90	28.50	1.30
Aug	1	0.00	0.00	0.00	0.00	2.45	0.43	81.85	-2.88	0.00	78.97	84.90	28.50	1.07
Aug	2	0.00	0.00	0.00	0.00	2.45	0.43	78.97	-2.88	0.00	76.09	84.90	28.50	0.84
Aug	3	2.75	0.00	0.00	2.75	2.45	0.43	76.09	-0.13	0.00	75.97	84.90	28.50	0.83
Aug	4	0.00	0.00	0.00	0.00	2.45	0.43	75.97	-2.88	0.00	73.09	84.90	28.50	0.60
Aug	5	0.00	0.00	0.00	0.00	2.45	0.43	73.09	-2.88	0.00	70.21	84.90	28.50	0.37
Aug	6	0.00	0.00	0.00	0.00	2.45	0.43	70.21	-2.88	0.00	67.33	84.90	28.50	0.14
Aug	7	0.00	0.00	0.00	0.00	2.45	0.43	67.33	-2.88	0.00	64.46	84.90	28.50	-0.46
Aug	8	0.00	0.00	0.00	0.00	2.45	0.43	64.46	-2.88	0.00	61.58	84.90	28.50	-1.67
Aug	9	0.00	0.00	0.00	0.00	2.45	0.43	61.58	-2.88	0.00	58.70	84.90	28.50	-2.88
Aug	10	0.00	0.00	0.00	0.00	2.45	0.43	58.70	-2.88	0.00	55.83	84.90	28.50	-4.09
Aug	11	0.00	0.00	0.00	0.00	2.45	0.43	55.83	-2.88	0.00	52.95	84.90	28.50	-5.30
Aug	12	0.00	0.00	0.00	0.00	2.45	0.43	52.95	-2.88	0.00	50.07	84.90	28.50	-6.51
Aug	13	1.13	0.00	0.00	1.13	2.45	0.43	50.07	-1.75	0.00	48.32	84.90	28.50	-7.25
Aug	14	3.13	0.00	0.00	3.13	2.45	0.43	48.32	0.25	0.00	48.57	84.90	28.50	-7.15
Aug	15	0.00	0.00	0.00	0.00	2.45	0.43	48.57	-2.88	0.00	45.69	84.90	28.50	-8.36
Aug	16	0.00	0.00	0.00	0.00	2.45	0.43	45.69	-2.88	0.00	42.82	84.90	28.50	-9.57
Aug	17	0.00	0.00	0.00	0.00	2.45	0.43	42.82	-2.88	0.00	39.94	84.90	28.50	-10.78
Aug	18	0.00	0.00	0.00	0.00	2.45	0.43	39.94	-2.88	0.00	37.06	84.90	28.50	-11.99
Aug	19	0.00	0.00	0.00	0.00	2.45	0.43	37.06	-2.88	0.00	34.19	84.90	28.50	-12.00
Aug	20	0.00	0.00	0.00	0.00	2.45	0.43	34.19	-2.88	0.00	31.31	84.90	28.50	-12.00
Aug	21	0.00	0.00	0.00	0.00	2.45	0.43	31.31	-2.88	0.00	28.43	84.90	28.50	-12.00
Aug	22	0.00	0.00	0.00	0.00	2.45	0.43	28.43	-2.88	0.00	25.56	84.90	28.50	-12.00
Aug	23	0.00	0.00	0.00	0.00	2.45	0.43	25.56	-2.88	0.00	22.68	84.90	28.50	-12.00
Aug	24	0.00	0.00	0.00	0.00	2.45	0.43	22.68	-2.88	0.00	19.80	84.90	28.50	-12.00
Aug	25	9.50	3.36	0.00	12.86	2.45	0.43	19.80	9.98	0.00	29.78	84.90	28.50	-8.78
Aug	26	0.00	0.00	0.00	0.00	2.45	0.43	29.78	-2.88	0.00	26.91	84.90	28.50	-9.99
Aug	27	0.00	0.00	0.00	0.00	2.45	0.43	26.91	-2.88	0.00	24.03	84.90	28.50	-11.21
Aug	28	0.00	0.00	0.00	0.00	2.45	0.43	24.03	-2.88	0.00	21.15	84.90	28.50	-12.00
Aug	29	0.00	0.00	0.00	0.00	2.45	0.43	21.15	-2.88	0.00	18.28	84.90	28.50	-12.00

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Aug	30	1.38	0.00	0.00	1.38	2.45	0.43	18.28	-1.50	0.00	16.77	84.90	28.50	-12.00
Aug	31	0.00	0.00	0.00	0.00	2.45	0.43	16.77	-2.88	0.00	13.90	84.90	28.50	-12.00
Sep	1	0.00	0.00	0.00	0.00	2.32	0.43	13.90	-2.75	0.00	11.15	84.90	28.50	-12.00
Sep	2	0.00	0.00	0.00	0.00	2.32	0.43	11.15	-2.75	0.00	8.40	84.90	28.50	-12.00
Sep	3	0.00	0.00	0.00	0.00	2.32	0.43	8.40	-2.75	0.00	5.66	84.90	28.50	-12.00
Sep	4	0.00	0.00	0.00	0.00	2.32	0.43	5.66	-2.75	0.00	2.91	84.90	28.50	-12.00
Sep	5	0.00	0.00	0.00	0.00	2.32	0.43	2.91	-2.75	0.00	0.17	84.90	28.50	-12.00
Sep	6	0.00	0.00	0.00	0.00	2.32	0.43	0.17	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	7	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	8	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	9	0.63	0.00	0.00	0.63	2.32	0.43	0.00	-2.12	0.00	0.00	84.90	28.50	-12.00
Sep	10	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	11	1.50	0.00	0.00	1.50	2.32	0.43	0.00	-1.25	0.00	0.00	84.90	28.50	-12.00
Sep	12	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	13	0.88	0.00	0.00	0.88	2.32	0.43	0.00	-1.87	0.00	0.00	84.90	28.50	-12.00
Sep	14	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	15	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	16	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	17	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	18	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	19	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	20	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	21	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	22	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	23	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	24	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	25	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	26	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	27	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	28	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	29	3.38	0.00	0.00	3.38	2.32	0.43	0.00	0.63	0.00	0.63	84.90	28.50	-11.74
Sep	30	22.38	28.61	0.00	50.99	2.32	0.43	0.63	48.24	0.00	48.87	84.90	28.50	0.03
Oct	1	0.13	0.00	0.00	0.13	1.73	0.43	48.87	-2.03	0.00	46.85	84.90	28.50	-0.67
Oct	2	0.00	0.00	0.00	0.00	1.73	0.43	46.85	-2.15	0.00	44.69	84.90	28.50	-1.58
Oct	3	0.00	0.00	0.00	0.00	1.73	0.43	44.69	-2.15	0.00	42.54	84.90	28.50	-2.48
Oct	4	0.00	0.00	0.00	0.00	1.73	0.43	42.54	-2.15	0.00	40.39	84.90	28.50	-3.39
Oct	5	0.00	0.00	0.00	0.00	1.73	0.43	40.39	-2.15	0.00	38.24	84.90	28.50	-4.29
Oct	6	0.00	0.00	0.00	0.00	1.73	0.43	38.24	-2.15	0.00	36.09	84.90	28.50	-5.20
Oct	7	0.00	0.00	0.00	0.00	1.73	0.43	36.09	-2.15	0.00	33.94	84.90	28.50	-6.11
Oct	8	0.00	0.00	0.00	0.00	1.73	0.43	33.94	-2.15	0.00	31.79	84.90	28.50	-7.01
Oct	9	0.00	0.00	0.00	0.00	1.73	0.43	31.79	-2.15	0.00	29.64	84.90	28.50	-7.92
Oct	10	0.00	0.00	0.00	0.00	1.73	0.43	29.64	-2.15	0.00	27.49	84.90	28.50	-8.82
Oct	11	0.00	0.00	0.00	0.00	1.73	0.43	27.49	-2.15	0.00	25.34	84.90	28.50	-9.73
Oct	12	0.00	0.00	0.00	0.00	1.73	0.43	25.34	-2.15	0.00	23.18	84.90	28.50	-10.63
Oct	13	0.13	0.00	0.00	0.13	1.73	0.43	23.18	-2.03	0.00	21.16	84.90	28.50	-11.49
Oct	14	1.25	0.00	0.00	1.25	1.73	0.43	21.16	-0.90	0.00	20.26	84.90	28.50	-11.87
Oct	15	37.63	80.00	0.00	117.63	1.73	0.43	20.26	115.48	50.83	84.90	84.90	28.50	2.52
Oct	16	0.00	0.00	0.00	0.00	1.73	0.43	84.90	-2.15	0.00	82.75	84.90	28.50	2.35
Oct	17	0.00	0.00	0.00	0.00	1.73	0.43	82.75	-2.15	0.00	80.60	84.90	28.50	2.18
Oct	18	0.88	0.00	0.00	0.88	1.73	0.43	80.60	-1.28	0.00	79.32	84.90	28.50	2.08
Oct	19	0.13	0.00	0.00	0.13	1.73	0.43	79.32	-2.03	0.00	77.30	84.90	28.50	1.92
Oct	20	7.88	1.82	0.00	9.69	1.73	0.43	77.30	7.54	0.00	84.84	84.90	28.50	2.42
Oct	21	0.00	0.00	0.00	0.00	1.73	0.43	84.84	-2.15	0.00	82.69	84.90	28.50	2.25
Oct	22	18.75	19.45	0.00	38.20	1.73	0.43	82.69	36.05	33.84	84.90	84.90	28.50	4.00
Oct	23	0.00	0.00	0.00	0.00	1.73	0.43	84.90	-2.15	0.00	82.75	84.90	28.50	3.83
Oct	24	0.00	0.00	0.00	0.00	1.73	0.43	82.75	-2.15	0.00	80.60	84.90	28.50	3.66
Oct	25	0.00	0.00	0.00	0.00	1.73	0.43	80.60	-2.15	0.00	78.45	84.90	28.50	3.48
Oct	26	0.00	0.00	0.00	0.00	1.73	0.43	78.45	-2.15	0.00	76.30	84.90	28.50	3.31
Oct	27	0.00	0.00	0.00	0.00	1.73	0.43	76.30	-2.15	0.00	74.14	84.90	28.50	3.14

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Oct	28	2.63	0.00	0.00	2.63	1.73	0.43	74.14	0.47	0.00	74.62	84.90	28.50	3.18
Oct	29	7.63	1.62	0.00	9.24	1.73	0.43	74.62	7.09	0.00	81.71	84.90	28.50	3.65
Oct	30	0.00	0.00	0.00	0.00	1.73	0.43	81.71	-2.15	0.00	79.56	84.90	28.50	3.48
Oct	31	4.75	0.15	0.00	4.90	1.73	0.43	79.56	2.75	0.00	82.31	84.90	28.50	3.69
Nov	1	0.00	0.00	0.00	0.00	1.21	0.44	82.31	-1.65	0.00	80.66	84.90	28.50	3.56
Nov	2	5.75	0.49	0.00	6.24	1.21	0.44	80.66	4.59	0.35	84.90	84.90	28.50	3.90
Nov	3	0.63	0.00	0.00	0.63	1.21	0.44	84.90	-1.02	0.00	83.88	84.90	28.50	3.82
Nov	4	0.00	0.00	0.00	0.00	1.21	0.44	83.88	-1.65	0.00	82.23	84.90	28.50	3.69
Nov	5	0.00	0.00	0.00	0.00	1.21	0.44	82.23	-1.65	0.00	80.58	84.90	28.50	3.56
Nov	6	0.00	0.00	0.00	0.00	1.21	0.44	80.58	-1.65	0.00	78.93	84.90	28.50	3.43
Nov	7	0.00	0.00	0.00	0.00	1.21	0.44	78.93	-1.65	0.00	77.29	84.90	28.50	3.29
Nov	8	0.00	0.00	0.00	0.00	1.21	0.44	77.29	-1.65	0.00	75.64	84.90	28.50	3.16
Nov	9	0.00	0.00	0.00	0.00	1.21	0.44	75.64	-1.65	0.00	73.99	84.90	28.50	3.03
Nov	10	0.00	0.00	0.00	0.00	1.21	0.44	73.99	-1.65	0.00	72.34	84.90	28.50	2.90
Nov	11	3.75	0.01	0.00	3.76	1.21	0.44	72.34	2.11	0.00	74.45	84.90	28.50	3.07
Nov	12	30.25	52.86	0.00	83.11	1.21	0.44	74.45	81.47	71.02	84.90	84.90	28.50	4.00
Nov	13	0.00	0.00	0.00	0.00	1.21	0.44	84.90	-1.65	0.00	83.25	84.90	28.50	3.87
Nov	14	0.00	0.00	0.00	0.00	1.21	0.44	83.25	-1.65	0.00	81.60	84.90	28.50	3.74
Nov	15	3.13	0.00	0.00	3.13	1.21	0.44	81.60	1.48	0.00	83.08	84.90	28.50	3.85
Nov	16	0.63	0.00	0.00	0.63	1.21	0.44	83.08	-1.02	0.00	82.06	84.90	28.50	3.77
Nov	17	0.13	0.00	0.00	0.13	1.21	0.44	82.06	-1.52	0.00	80.54	84.90	28.50	3.65
Nov	18	0.00	0.00	0.00	0.00	1.21	0.44	80.54	-1.65	0.00	78.89	84.90	28.50	3.52
Nov	19	1.88	0.00	0.00	1.88	1.21	0.44	78.89	0.23	0.00	79.12	84.90	28.50	3.54
Nov	20	0.00	0.00	0.00	0.00	1.21	0.44	79.12	-1.65	0.00	77.47	84.90	28.50	3.41
Nov	21	0.00	0.00	0.00	0.00	1.21	0.44	77.47	-1.65	0.00	75.82	84.90	28.50	3.27
Nov	22	0.00	0.00	0.00	0.00	1.21	0.44	75.82	-1.65	0.00	74.17	84.90	28.50	3.14
Nov	23	0.00	0.00	0.00	0.00	1.21	0.44	74.17	-1.65	0.00	72.53	84.90	28.50	3.01
Nov	24	2.50	0.00	0.00	2.50	1.21	0.44	72.53	0.85	0.00	73.38	84.90	28.50	3.08
Nov	25	31.25	56.31	0.00	87.56	1.21	0.44	73.38	85.92	74.39	84.90	84.90	28.50	4.00
Nov	26	0.00	0.00	0.00	0.00	1.21	0.44	84.90	-1.65	0.00	83.25	84.90	28.50	3.87
Nov	27	7.00	1.17	0.00	8.17	1.21	0.44	83.25	6.53	4.88	84.90	84.90	28.50	4.00
Nov	28	2.13	0.00	0.00	2.13	1.21	0.44	84.90	0.48	0.48	84.90	84.90	28.50	4.00
Nov	29	0.00	0.00	0.00	0.00	1.21	0.44	84.90	-1.65	0.00	83.25	84.90	28.50	3.87
Nov	30	0.00	0.00	0.00	0.00	1.21	0.44	83.25	-1.65	0.00	81.60	84.90	28.50	3.74
Dec	1	0.00	0.00	0.00	0.00	0.95	0.41	81.60	-1.36	0.00	80.25	84.90	28.50	3.63
Dec	2	0.00	0.00	0.00	0.00	0.95	0.41	80.25	-1.36	0.00	78.89	84.90	28.50	3.52
Dec	3	0.00	0.00	0.00	0.00	0.95	0.41	78.89	-1.36	0.00	77.53	84.90	28.50	3.41
Dec	4	0.00	0.00	0.00	0.00	0.95	0.41	77.53	-1.36	0.00	76.17	84.90	28.50	3.30
Dec	5	0.00	0.00	0.00	0.00	0.95	0.41	76.17	-1.36	0.00	74.81	84.90	28.50	3.19
Dec	6	0.00	0.00	0.00	0.00	0.95	0.41	74.81	-1.36	0.00	73.45	84.90	28.50	3.08
Dec	7	0.00	0.00	0.00	0.00	0.95	0.41	73.45	-1.36	0.00	72.09	84.90	28.50	2.98
Dec	8	0.00	0.00	0.00	0.00	0.95	0.41	72.09	-1.36	0.00	70.73	84.90	28.50	2.87
Dec	9	0.00	0.00	0.00	0.00	0.95	0.41	70.73	-1.36	0.00	69.37	84.90	28.50	2.76
Dec	10	17.25	16.09	0.00	33.34	0.95	0.41	69.37	31.98	16.46	84.90	84.90	28.50	4.00
Dec	11	9.75	3.63	0.00	13.38	0.95	0.41	84.90	12.02	12.02	84.90	84.90	28.50	4.00
Dec	12	11.50	5.83	0.00	17.33	0.95	0.41	84.90	15.97	15.97	84.90	84.90	28.50	4.00
Dec	13	12.50	7.29	0.00	19.79	0.95	0.41	84.90	18.43	18.43	84.90	84.90	28.50	4.00
Dec	14	0.00	0.00	0.00	0.00	0.95	0.41	84.90	-1.36	0.00	83.54	84.90	28.50	3.89
Dec	15	0.00	0.00	0.00	0.00	0.95	0.41	83.54	-1.36	0.00	82.18	84.90	28.50	3.78
Dec	16	0.00	0.00	0.00	0.00	0.95	0.41	82.18	-1.36	0.00	80.82	84.90	28.50	3.67
Dec	17	0.00	0.00	0.00	0.00	0.95	0.41	80.82	-1.36	0.00	79.46	84.90	28.50	3.57
Dec	18	0.63	0.00	0.00	0.63	0.95	0.41	79.46	-0.73	0.00	78.73	84.90	28.50	3.51
Dec	19	0.00	0.00	0.00	0.00	0.95	0.41	78.73	-1.36	0.00	77.37	84.90	28.50	3.40
Dec	20	0.00	0.00	0.00	0.00	0.95	0.41	77.37	-1.36	0.00	76.01	84.90	28.50	3.29
Dec	21	0.00	0.00	0.00	0.00	0.95	0.41	76.01	-1.36	0.00	74.65	84.90	28.50	3.18
Dec	22	0.00	0.00	0.00	0.00	0.95	0.41	74.65	-1.36	0.00	73.29	84.90	28.50	3.07
Dec	23	0.00	0.00	0.00	0.00	0.95	0.41	73.29	-1.36	0.00	71.93	84.90	28.50	2.96
Dec	24	0.00	0.00	0.00	0.00	0.95	0.41	71.93	-1.36	0.00	70.58	84.90	28.50	2.85
Dec	25	0.00	0.00	0.00	0.00	0.95	0.41	70.58	-1.36	0.00	69.22	84.90	28.50	2.75

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Dec	26	0.00	0.00	0.00	0.00	0.95	0.41	69.22	-1.36	0.00	67.86	84.90	28.50	2.64
Dec	27	0.00	0.00	0.00	0.00	0.95	0.41	67.86	-1.36	0.00	66.50	84.90	28.50	2.53
Dec	28	0.00	0.00	0.00	0.00	0.95	0.41	66.50	-1.36	0.00	65.14	84.90	28.50	2.42
Dec	29	0.00	0.00	0.00	0.00	0.95	0.41	65.14	-1.36	0.00	63.78	84.90	28.50	2.31
Dec	30	0.00	0.00	0.00	0.00	0.95	0.41	63.78	-1.36	0.00	62.42	84.90	28.50	2.20
Dec	31	0.00	0.00	0.00	0.00	0.95	0.41	62.42	-1.36	0.00	61.06	84.90	28.50	2.09

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WET YEAR - 2004

Month	Day	INPUTS				OUTPUTS		WETLAND VOLUME CHANGE						
		Direct Precipitation	Runoff	Baseflow	Total Water Input	PET	Groundwater Outflow	Initial Wetland Volume	Wetland Volume Change	Water Released	Resulting Wetland Volume	Maximum	Saturation	#VALUE!
		(acre-in)	(acre-in)	(acre -Inches)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	(acre-in)	#VALUE!
											50.00			**3.763359928**
Jan	1	0.00	0.00	0.00	0.00	0.95	0.43	50.00	-1.38	0.00	48.62	84.90	28.50	1.37
Jan	2	0.00	0.00	0.00	0.00	0.95	0.43	48.62	-1.38	0.00	47.25	84.90	28.50	1.26
Jan	3	0.00	0.00	0.00	0.00	0.95	0.43	47.25	-1.38	0.00	45.87	84.90	28.50	1.15
Jan	4	0.00	0.00	0.00	0.00	0.95	0.43	45.87	-1.38	0.00	44.49	84.90	28.50	1.04
Jan	5	0.00	0.00	0.00	0.00	0.95	0.43	44.49	-1.38	0.00	43.12	84.90	28.50	0.93
Jan	6	0.00	0.00	0.00	0.00	0.95	0.43	43.12	-1.38	0.00	41.74	84.90	28.50	0.82
Jan	7	0.00	0.00	0.00	0.00	0.95	0.43	41.74	-1.38	0.00	40.36	84.90	28.50	0.71
Jan	8	6.88	1.09	0.00	7.97	0.95	0.43	40.36	6.59	0.00	46.95	84.90	28.50	1.18
Jan	9	0.00	0.00	0.00	0.00	0.95	0.43	46.95	-1.38	0.00	45.58	84.90	28.50	1.07
Jan	10	0.00	0.00	0.00	0.00	0.95	0.43	45.58	-1.38	0.00	44.20	84.90	28.50	0.96
Jan	11	0.00	0.00	0.00	0.00	0.95	0.43	44.20	-1.38	0.00	42.82	84.90	28.50	0.85
Jan	12	0.00	0.00	0.00	0.00	0.95	0.43	42.82	-1.38	0.00	41.45	84.90	28.50	0.74
Jan	13	0.00	0.00	0.00	0.00	0.95	0.43	41.45	-1.38	0.00	40.07	84.90	28.50	0.63
Jan	14	0.00	0.00	0.00	0.00	0.95	0.43	40.07	-1.38	0.00	38.69	84.90	28.50	0.52
Jan	15	1.38	0.00	0.00	1.38	0.95	0.43	38.69	0.00	0.00	38.69	84.90	28.50	0.52
Jan	16	2.75	0.00	0.00	2.75	0.95	0.43	38.69	1.37	0.00	40.06	84.90	28.50	0.63
Jan	17	31.88	58.51	0.00	90.38	0.95	0.43	40.06	89.01	44.17	84.90	84.90	28.50	4.00
Jan	18	0.00	0.00	0.00	0.00	0.95	0.43	84.90	-1.38	0.00	83.52	84.90	28.50	3.89
Jan	19	0.00	0.00	0.00	0.00	0.95	0.43	83.52	-1.38	0.00	82.15	84.90	28.50	3.78
Jan	20	0.00	0.00	0.00	0.00	0.95	0.43	82.15	-1.38	0.00	80.77	84.90	28.50	3.67
Jan	21	0.00	0.00	0.00	0.00	0.95	0.43	80.77	-1.38	0.00	79.39	84.90	28.50	3.56
Jan	22	0.00	0.00	0.00	0.00	0.95	0.43	79.39	-1.38	0.00	78.02	84.90	28.50	3.45
Jan	23	0.00	0.00	0.00	0.00	0.95	0.43	78.02	-1.38	0.00	76.64	84.90	28.50	3.34
Jan	24	0.00	0.00	0.00	0.00	0.95	0.43	76.64	-1.38	0.00	75.26	84.90	28.50	3.23
Jan	25	12.50	7.29	0.00	19.79	0.95	0.43	75.26	18.41	8.78	84.90	84.90	28.50	4.00
Jan	26	14.25	10.19	0.00	24.44	0.95	0.43	84.90	23.06	23.06	84.90	84.90	28.50	4.00
Jan	27	0.00	0.00	0.00	0.00	0.95	0.43	84.90	-1.38	0.00	83.52	84.90	28.50	3.89
Jan	28	0.00	0.00	0.00	0.00	0.95	0.43	83.52	-1.38	0.00	82.15	84.90	28.50	3.78
Jan	29	0.00	0.00	0.00	0.00	0.95	0.43	82.15	-1.38	0.00	80.77	84.90	28.50	3.67
Jan	30	12.13	6.73	0.00	18.85	0.95	0.43	80.77	17.47	13.34	84.90	84.90	28.50	4.00
Jan	31	0.00	0.00	0.00	0.00	0.95	0.43	84.90	-1.38	0.00	83.52	84.90	28.50	3.89
Feb	1	0.00	0.00	0.00	0.00	1.26	0.43	83.52	-1.69	0.00	81.83	84.90	28.50	3.75
Feb	2	12.13	6.73	0.00	18.85	1.26	0.43	81.83	17.16	14.10	84.90	84.90	28.50	4.00
Feb	3	0.00	0.00	0.00	0.00	1.26	0.43	84.90	-1.69	0.00	83.21	84.90	28.50	3.86
Feb	4	0.00	0.00	0.00	0.00	1.26	0.43	83.21	-1.69	0.00	81.52	84.90	28.50	3.73
Feb	5	8.75	2.59	0.00	11.34	1.26	0.43	81.52	9.65	6.28	84.90	84.90	28.50	4.00
Feb	6	0.63	0.00	0.00	0.63	1.26	0.43	84.90	-1.06	0.00	83.84	84.90	28.50	3.91
Feb	7	0.00	0.00	0.00	0.00	1.26	0.43	83.84	-1.69	0.00	82.15	84.90	28.50	3.78
Feb	8	0.00	0.00	0.00	0.00	1.26	0.43	82.15	-1.69	0.00	80.46	84.90	28.50	3.64
Feb	9	0.00	0.00	0.00	0.00	1.26	0.43	80.46	-1.69	0.00	78.77	84.90	28.50	3.51
Feb	10	1.50	0.00	0.00	1.50	1.26	0.43	78.77	-0.19	0.00	78.58	84.90	28.50	3.49
Feb	11	19.38	20.93	0.00	40.31	1.26	0.43	78.58	38.62	32.30	84.90	84.90	28.50	4.00

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Feb	12	1.63	0.00	0.00	1.63	1.26	0.43	84.90	-0.06	0.00	84.84	84.90	28.50	3.99
Feb	13	0.00	0.00	0.00	0.00	1.26	0.43	84.84	-1.69	0.00	83.15	84.90	28.50	3.86
Feb	14	5.13	0.25	0.00	5.38	1.26	0.43	83.15	3.69	1.94	84.90	84.90	28.50	4.00
Feb	15	0.00	0.00	0.00	0.00	1.26	0.43	84.90	-1.69	0.00	83.21	84.90	28.50	3.86
Feb	16	0.00	0.00	0.00	0.00	1.26	0.43	83.21	-1.69	0.00	81.52	84.90	28.50	3.73
Feb	17	0.00	0.00	0.00	0.00	1.26	0.43	81.52	-1.69	0.00	79.83	84.90	28.50	3.59
Feb	18	0.00	0.00	0.00	0.00	1.26	0.43	79.83	-1.69	0.00	78.15	84.90	28.50	3.46
Feb	19	0.00	0.00	0.00	0.00	1.26	0.43	78.15	-1.69	0.00	76.46	84.90	28.50	3.32
Feb	20	0.00	0.00	0.00	0.00	1.26	0.43	76.46	-1.69	0.00	74.77	84.90	28.50	3.19
Feb	21	0.00	0.00	0.00	0.00	1.26	0.43	74.77	-1.69	0.00	73.08	84.90	28.50	3.05
Feb	22	0.00	0.00	0.00	0.00	1.26	0.43	73.08	-1.69	0.00	71.39	84.90	28.50	2.92
Feb	23	6.38	0.80	0.00	7.17	1.26	0.43	71.39	5.48	0.00	76.87	84.90	28.50	3.31
Feb	24	0.00	0.00	0.00	0.00	1.26	0.43	76.87	-1.69	0.00	75.18	84.90	28.50	3.18
Feb	25	3.13	0.00	0.00	3.13	1.26	0.43	75.18	1.44	0.00	76.62	84.90	28.50	3.29
Feb	26	3.13	0.00	0.00	3.13	1.26	0.43	76.62	1.44	0.00	78.06	84.90	28.50	3.41
Feb	27	0.00	0.00	0.00	0.00	1.26	0.43	78.06	-1.69	0.00	76.37	84.90	28.50	3.27
Feb	28	0.00	0.00	0.00	0.00	1.26	0.43	76.37	-1.69	0.00	74.68	84.90	28.50	3.14
Mar	1	0.00	0.00	0.00	0.00	1.74	0.43	74.68	-2.17	0.00	72.51	84.90	28.50	2.96
Mar	2	0.00	0.00	0.00	0.00	1.74	0.43	72.51	-2.17	0.00	70.35	84.90	28.50	2.79
Mar	3	0.75	0.00	0.00	0.75	1.74	0.43	70.35	-1.42	0.00	68.93	84.90	28.50	2.68
Mar	4	0.38	0.00	0.00	0.38	1.74	0.43	68.93	-1.79	0.00	67.14	84.90	28.50	2.53
Mar	5	4.13	0.04	0.00	4.16	1.74	0.43	67.14	1.99	0.00	69.13	84.90	28.50	2.69
Mar	6	0.00	0.00	0.00	0.00	1.74	0.43	69.13	-2.17	0.00	66.96	84.90	28.50	2.52
Mar	7	0.00	0.00	0.00	0.00	1.74	0.43	66.96	-2.17	0.00	64.80	84.90	28.50	2.35
Mar	8	0.00	0.00	0.00	0.00	1.74	0.43	64.80	-2.17	0.00	62.63	84.90	28.50	2.17
Mar	9	0.00	0.00	0.00	0.00	1.74	0.43	62.63	-2.17	0.00	60.46	84.90	28.50	2.00
Mar	10	0.00	0.00	0.00	0.00	1.74	0.43	60.46	-2.17	0.00	58.30	84.90	28.50	1.83
Mar	11	0.00	0.00	0.00	0.00	1.74	0.43	58.30	-2.17	0.00	56.13	84.90	28.50	1.65
Mar	12	0.00	0.00	0.00	0.00	1.74	0.43	56.13	-2.17	0.00	53.96	84.90	28.50	1.48
Mar	13	0.00	0.00	0.00	0.00	1.74	0.43	53.96	-2.17	0.00	51.79	84.90	28.50	1.31
Mar	14	0.00	0.00	0.00	0.00	1.74	0.43	51.79	-2.17	0.00	49.63	84.90	28.50	1.13
Mar	15	18.75	19.45	0.00	38.20	1.74	0.43	49.63	36.04	0.76	84.90	84.90	28.50	2.93
Mar	16	0.00	0.00	0.00	0.00	1.74	0.43	84.90	-2.17	0.00	82.73	84.90	28.50	2.76
Mar	17	0.00	0.00	0.00	0.00	1.74	0.43	82.73	-2.17	0.00	80.57	84.90	28.50	2.58
Mar	18	0.00	0.00	0.00	0.00	1.74	0.43	80.57	-2.17	0.00	78.40	84.90	28.50	2.41
Mar	19	0.00	0.00	0.00	0.00	1.74	0.43	78.40	-2.17	0.00	76.23	84.90	28.50	2.24
Mar	20	0.00	0.00	0.00	0.00	1.74	0.43	76.23	-2.17	0.00	74.06	84.90	28.50	2.06
Mar	21	13.13	8.28	0.00	21.40	1.74	0.43	74.06	19.23	8.40	84.90	84.90	28.50	3.14
Mar	22	0.00	0.00	0.00	0.00	1.74	0.43	84.90	-2.17	0.00	82.73	84.90	28.50	2.97
Mar	23	0.00	0.00	0.00	0.00	1.74	0.43	82.73	-2.17	0.00	80.57	84.90	28.50	2.79
Mar	24	0.00	0.00	0.00	0.00	1.74	0.43	80.57	-2.17	0.00	78.40	84.90	28.50	2.62
Mar	25	0.00	0.00	0.00	0.00	1.74	0.43	78.40	-2.17	0.00	76.23	84.90	28.50	2.45
Mar	26	0.00	0.00	0.00	0.00	1.74	0.43	76.23	-2.17	0.00	74.06	84.90	28.50	2.27
Mar	27	0.00	0.00	0.00	0.00	1.74	0.43	74.06	-2.17	0.00	71.90	84.90	28.50	2.10
Mar	28	0.00	0.00	0.00	0.00	1.74	0.43	71.90	-2.17	0.00	69.73	84.90	28.50	1.93
Mar	29	0.00	0.00	0.00	0.00	1.74	0.43	69.73	-2.17	0.00	67.56	84.90	28.50	1.75
Mar	30	0.00	0.00	0.00	0.00	1.74	0.43	67.56	-2.17	0.00	65.40	84.90	28.50	1.58
Mar	31	0.00	0.00	0.00	0.00	1.74	0.43	65.40	-2.17	0.00	63.23	84.90	28.50	1.41
Apr	1	0.00	0.00	0.00	0.00	2.09	0.43	63.23	-2.51	0.00	60.72	84.90	28.50	1.21
Apr	2	0.00	0.00	0.00	0.00	2.09	0.43	60.72	-2.51	0.00	58.20	84.90	28.50	1.00
Apr	3	4.38	0.07	0.00	4.45	2.09	0.43	58.20	1.93	0.00	60.14	84.90	28.50	1.16
Apr	4	0.00	0.00	0.00	0.00	2.09	0.43	60.14	-2.51	0.00	57.63	84.90	28.50	0.95
Apr	5	0.00	0.00	0.00	0.00	2.09	0.43	57.63	-2.51	0.00	55.11	84.90	28.50	0.75
Apr	6	0.00	0.00	0.00	0.00	2.09	0.43	55.11	-2.51	0.00	52.60	84.90	28.50	0.55
Apr	7	0.00	0.00	0.00	0.00	2.09	0.43	52.60	-2.51	0.00	50.09	84.90	28.50	0.35
Apr	8	4.75	0.15	0.00	4.90	2.09	0.43	50.09	2.39	0.00	52.47	84.90	28.50	0.53
Apr	9	0.00	0.00	0.00	0.00	2.09	0.43	52.47	-2.51	0.00	49.96	84.90	28.50	0.33
Apr	10	0.00	0.00	0.00	0.00	2.09	0.43	49.96	-2.51	0.00	47.45	84.90	28.50	0.13
Apr	11	39.38	86.97	0.00	126.34	2.09	0.43	47.45	123.83	86.38	84.90	84.90	28.50	4.00

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Apr	12	2.13	0.00	0.00	2.13	2.09	0.43	84.90	-0.39	0.00	84.51	84.90	28.50	3.97
Apr	13	1.88	0.00	0.00	1.88	2.09	0.43	84.51	-0.64	0.00	83.87	84.90	28.50	3.92
Apr	14	0.00	0.00	0.00	0.00	2.09	0.43	83.87	-2.51	0.00	81.36	84.90	28.50	3.72
Apr	15	0.00	0.00	0.00	0.00	2.09	0.43	81.36	-2.51	0.00	78.85	84.90	28.50	3.52
Apr	16	0.00	0.00	0.00	0.00	2.09	0.43	78.85	-2.51	0.00	76.34	84.90	28.50	3.31
Apr	17	0.00	0.00	0.00	0.00	2.09	0.43	76.34	-2.51	0.00	73.82	84.90	28.50	3.11
Apr	18	0.00	0.00	0.00	0.00	2.09	0.43	73.82	-2.51	0.00	71.31	84.90	28.50	2.91
Apr	19	0.00	0.00	0.00	0.00	2.09	0.43	71.31	-2.51	0.00	68.80	84.90	28.50	2.71
Apr	20	0.00	0.00	0.00	0.00	2.09	0.43	68.80	-2.51	0.00	66.29	84.90	28.50	2.51
Apr	21	0.00	0.00	0.00	0.00	2.09	0.43	66.29	-2.51	0.00	63.77	84.90	28.50	2.31
Apr	22	0.00	0.00	0.00	0.00	2.09	0.43	63.77	-2.51	0.00	61.26	84.90	28.50	2.11
Apr	23	0.00	0.00	0.00	0.00	2.09	0.43	61.26	-2.51	0.00	58.75	84.90	28.50	1.91
Apr	24	6.25	0.73	0.00	6.98	2.09	0.43	58.75	4.47	0.00	63.21	84.90	28.50	2.22
Apr	25	21.50	26.28	0.00	47.78	2.09	0.43	63.21	45.26	23.58	84.90	84.90	28.50	4.00
Apr	26	19.88	22.15	0.00	42.02	2.09	0.43	84.90	39.51	39.51	84.90	84.90	28.50	4.00
Apr	27	0.00	0.00	0.00	0.00	2.09	0.43	84.90	-2.51	0.00	82.39	84.90	28.50	3.80
Apr	28	0.00	0.00	0.00	0.00	2.09	0.43	82.39	-2.51	0.00	79.87	84.90	28.50	3.60
Apr	29	0.00	0.00	0.00	0.00	2.09	0.43	79.87	-2.51	0.00	77.36	84.90	28.50	3.40
Apr	30	0.00	0.00	0.00	0.00	2.09	0.43	77.36	-2.51	0.00	74.85	84.90	28.50	3.20
May	1	43.75	105.17	0.00	148.92	2.46	0.43	74.85	146.03	135.98	84.90	84.90	28.50	4.00
May	2	0.00	0.00	0.00	0.00	2.46	0.43	84.90	-2.89	0.00	82.01	84.90	28.50	3.77
May	3	0.00	0.00	0.00	0.00	2.46	0.43	82.01	-2.89	0.00	79.12	84.90	28.50	3.54
May	4	0.00	0.00	0.00	0.00	2.46	0.43	79.12	-2.89	0.00	76.23	84.90	28.50	3.31
May	5	0.00	0.00	0.00	0.00	2.46	0.43	76.23	-2.89	0.00	73.34	84.90	28.50	3.08
May	6	0.00	0.00	0.00	0.00	2.46	0.43	73.34	-2.89	0.00	70.46	84.90	28.50	2.84
May	7	0.00	0.00	0.00	0.00	2.46	0.43	70.46	-2.89	0.00	67.57	84.90	28.50	2.61
May	8	0.00	0.00	0.00	0.00	2.46	0.43	67.57	-2.89	0.00	64.68	84.90	28.50	2.38
May	9	0.00	0.00	0.00	0.00	2.46	0.43	64.68	-2.89	0.00	61.79	84.90	28.50	2.15
May	10	0.00	0.00	0.00	0.00	2.46	0.43	61.79	-2.89	0.00	58.90	84.90	28.50	1.92
May	11	11.25	5.49	0.00	16.74	2.46	0.43	58.90	13.85	0.00	72.75	84.90	28.50	2.72
May	12	28.75	47.83	0.00	76.58	2.46	0.43	72.75	73.69	61.54	84.90	84.90	28.50	4.00
May	13	0.00	0.00	0.00	0.00	2.46	0.43	84.90	-2.89	0.00	82.01	84.90	28.50	3.77
May	14	27.50	43.78	0.00	71.28	2.46	0.43	82.01	68.39	65.50	84.90	84.90	28.50	4.00
May	15	0.00	0.00	0.00	0.00	2.46	0.43	84.90	-2.89	0.00	82.01	84.90	28.50	3.77
May	16	0.00	0.00	0.00	0.00	2.46	0.43	82.01	-2.89	0.00	79.12	84.90	28.50	3.54
May	17	0.00	0.00	0.00	0.00	2.46	0.43	79.12	-2.89	0.00	76.23	84.90	28.50	3.31
May	18	0.00	0.00	0.00	0.00	2.46	0.43	76.23	-2.89	0.00	73.34	84.90	28.50	3.08
May	19	6.88	1.09	0.00	7.97	2.46	0.43	73.34	5.08	0.00	78.42	84.90	28.50	3.42
May	20	0.00	0.00	0.00	0.00	2.46	0.43	78.42	-2.89	0.00	75.53	84.90	28.50	3.19
May	21	0.00	0.00	0.00	0.00	2.46	0.43	75.53	-2.89	0.00	72.64	84.90	28.50	2.96
May	22	0.00	0.00	0.00	0.00	2.46	0.43	72.64	-2.89	0.00	69.76	84.90	28.50	2.73
May	23	0.00	0.00	0.00	0.00	2.46	0.43	69.76	-2.89	0.00	66.87	84.90	28.50	2.50
May	24	0.00	0.00	0.00	0.00	2.46	0.43	66.87	-2.89	0.00	63.98	84.90	28.50	2.27
May	25	0.00	0.00	0.00	0.00	2.46	0.43	63.98	-2.89	0.00	61.09	84.90	28.50	2.03
May	26	0.00	0.00	0.00	0.00	2.46	0.43	61.09	-2.89	0.00	58.20	84.90	28.50	1.80
May	27	0.00	0.00	0.00	0.00	2.46	0.43	58.20	-2.89	0.00	55.31	84.90	28.50	1.57
May	28	0.00	0.00	0.00	0.00	2.46	0.43	55.31	-2.89	0.00	52.42	84.90	28.50	1.34
May	29	43.75	105.17	0.00	148.92	2.46	0.43	52.42	146.03	113.55	84.90	84.90	28.50	4.00
May	30	0.00	0.00	0.00	0.00	2.46	0.43	84.90	-2.89	0.00	82.01	84.90	28.50	3.77
May	31	0.00	0.00	0.00	0.00	2.46	0.43	82.01	-2.89	0.00	79.12	84.90	28.50	3.54
Jun	1	0.00	0.00	0.00	0.00	2.74	0.43	79.12	-3.16	0.00	75.96	84.90	28.50	3.28
Jun	2	0.00	0.00	0.00	0.00	2.74	0.43	75.96	-3.16	0.00	72.80	84.90	28.50	3.03
Jun	3	1.25	0.00	0.00	1.25	2.74	0.43	72.80	-1.91	0.00	70.88	84.90	28.50	2.88
Jun	4	0.00	0.00	0.00	0.00	2.74	0.43	70.88	-3.16	0.00	67.72	84.90	28.50	2.63
Jun	5	6.25	0.73	0.00	6.98	2.74	0.43	67.72	3.82	0.00	71.54	84.90	28.50	2.89
Jun	6	0.00	0.00	0.00	0.00	2.74	0.43	71.54	-3.16	0.00	68.37	84.90	28.50	2.64
Jun	7	0.00	0.00	0.00	0.00	2.74	0.43	68.37	-3.16	0.00	65.21	84.90	28.50	2.38
Jun	8	10.63	4.67	0.00	15.30	2.74	0.43	65.21	12.13	0.00	77.35	84.90	28.50	3.09
Jun	9	18.75	19.45	0.00	38.20	2.74	0.43	77.35	35.04	27.49	84.90	84.90	28.50	4.00

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Jun	10	18.75	19.45	0.00	38.20	2.74	0.43	84.90	35.04	35.04	84.90	84.90	28.50	4.00
Jun	11	0.00	0.00	0.00	0.00	2.74	0.43	84.90	-3.16	0.00	81.74	84.90	28.50	3.75
Jun	12	0.00	0.00	0.00	0.00	2.74	0.43	81.74	-3.16	0.00	78.57	84.90	28.50	3.49
Jun	13	0.00	0.00	0.00	0.00	2.74	0.43	78.57	-3.16	0.00	75.41	84.90	28.50	3.24
Jun	14	22.50	28.95	0.00	51.45	2.74	0.43	75.41	48.29	38.80	84.90	84.90	28.50	4.00
Jun	15	0.00	0.00	0.00	0.00	2.74	0.43	84.90	-3.16	0.00	81.74	84.90	28.50	3.75
Jun	16	0.63	0.00	0.00	0.63	2.74	0.43	81.74	-2.54	0.00	79.20	84.90	28.50	3.54
Jun	17	0.00	0.00	0.00	0.00	2.74	0.43	79.20	-3.16	0.00	76.04	84.90	28.50	3.29
Jun	18	3.75	0.01	0.00	3.76	2.74	0.43	76.04	0.59	0.00	76.63	84.90	28.50	3.34
Jun	19	0.00	0.00	0.00	0.00	2.74	0.43	76.63	-3.16	0.00	73.47	84.90	28.50	3.09
Jun	20	0.00	0.00	0.00	0.00	2.74	0.43	73.47	-3.16	0.00	70.30	84.90	28.50	2.83
Jun	21	3.13	0.00	0.00	3.13	2.74	0.43	70.30	-0.04	0.00	70.27	84.90	28.50	2.83
Jun	22	0.00	0.00	0.00	0.00	2.74	0.43	70.27	-3.16	0.00	67.10	84.90	28.50	2.58
Jun	23	15.00	11.56	0.00	26.56	2.74	0.43	67.10	23.39	5.60	84.90	84.90	28.50	3.80
Jun	24	23.13	30.68	0.00	53.80	2.74	0.43	84.90	50.64	50.64	84.90	84.90	28.50	4.00
Jun	25	9.38	3.22	0.00	12.60	2.74	0.43	84.90	9.44	9.44	84.90	84.90	28.50	4.00
Jun	26	14.75	11.09	0.00	25.84	2.74	0.43	84.90	22.68	22.68	84.90	84.90	28.50	4.00
Jun	27	8.75	2.59	0.00	11.34	2.74	0.43	84.90	8.18	8.18	84.90	84.90	28.50	4.00
Jun	28	2.38	0.00	0.00	2.38	2.74	0.43	84.90	-0.79	0.00	84.11	84.90	28.50	3.94
Jun	29	2.00	0.00	0.00	2.00	2.74	0.43	84.11	-1.16	0.00	82.95	84.90	28.50	3.84
Jun	30	3.13	0.00	0.00	3.13	2.74	0.43	82.95	-0.04	0.00	82.91	84.90	28.50	3.84
Jul	1	2.50	0.00	0.00	2.50	2.63	0.43	82.91	-0.55	0.00	82.36	84.90	28.50	3.80
Jul	2	0.00	0.00	0.00	0.00	2.63	0.43	82.36	-3.05	0.00	79.30	84.90	28.50	3.55
Jul	3	0.00	0.00	0.00	0.00	2.63	0.43	79.30	-3.05	0.00	76.25	84.90	28.50	3.31
Jul	4	0.00	0.00	0.00	0.00	2.63	0.43	76.25	-3.05	0.00	73.19	84.90	28.50	3.06
Jul	5	0.00	0.00	0.00	0.00	2.63	0.43	73.19	-3.05	0.00	70.14	84.90	28.50	2.82
Jul	6	0.00	0.00	0.00	0.00	2.63	0.43	70.14	-3.05	0.00	67.09	84.90	28.50	2.57
Jul	7	2.50	0.00	0.00	2.50	2.63	0.43	67.09	-0.55	0.00	66.53	84.90	28.50	2.53
Jul	8	0.00	0.00	0.00	0.00	2.63	0.43	66.53	-3.05	0.00	63.48	84.90	28.50	2.29
Jul	9	0.00	0.00	0.00	0.00	2.63	0.43	63.48	-3.05	0.00	60.42	84.90	28.50	2.04
Jul	10	0.00	0.00	0.00	0.00	2.63	0.43	60.42	-3.05	0.00	57.37	84.90	28.50	1.80
Jul	11	0.00	0.00	0.00	0.00	2.63	0.43	57.37	-3.05	0.00	54.32	84.90	28.50	1.55
Jul	12	3.38	0.00	0.00	3.38	2.63	0.43	54.32	0.32	0.00	54.64	84.90	28.50	1.58
Jul	13	0.00	0.00	0.00	0.00	2.63	0.43	54.64	-3.05	0.00	51.58	84.90	28.50	1.33
Jul	14	0.00	0.00	0.00	0.00	2.63	0.43	51.58	-3.05	0.00	48.53	84.90	28.50	1.09
Jul	15	0.00	0.00	0.00	0.00	2.63	0.43	48.53	-3.05	0.00	45.47	84.90	28.50	0.85
Jul	16	0.00	0.00	0.00	0.00	2.63	0.43	45.47	-3.05	0.00	42.42	84.90	28.50	0.60
Jul	17	0.00	0.00	0.00	0.00	2.63	0.43	42.42	-3.05	0.00	39.37	84.90	28.50	0.36
Jul	18	0.00	0.00	0.00	0.00	2.63	0.43	39.37	-3.05	0.00	36.31	84.90	28.50	0.11
Jul	19	0.00	0.00	0.00	0.00	2.63	0.43	36.31	-3.05	0.00	33.26	84.90	28.50	-0.69
Jul	20	0.00	0.00	0.00	0.00	2.63	0.43	33.26	-3.05	0.00	30.20	84.90	28.50	-1.98
Jul	21	0.00	0.00	0.00	0.00	2.63	0.43	30.20	-3.05	0.00	27.15	84.90	28.50	-3.26
Jul	22	0.00	0.00	0.00	0.00	2.63	0.43	27.15	-3.05	0.00	24.09	84.90	28.50	-4.55
Jul	23	0.63	0.00	0.00	0.63	2.63	0.43	24.09	-2.43	0.00	21.66	84.90	28.50	-5.57
Jul	24	0.00	0.00	0.00	0.00	2.63	0.43	21.66	-3.05	0.00	18.61	84.90	28.50	-6.86
Jul	25	0.00	0.00	0.00	0.00	2.63	0.43	18.61	-3.05	0.00	15.56	84.90	28.50	-8.14
Jul	26	5.75	0.49	0.00	6.24	2.63	0.43	15.56	3.18	0.00	18.74	84.90	28.50	-6.95
Jul	27	0.00	0.00	0.00	0.00	2.63	0.43	18.74	-3.05	0.00	15.69	84.90	28.50	-8.23
Jul	28	0.00	0.00	0.00	0.00	2.63	0.43	15.69	-3.05	0.00	12.63	84.90	28.50	-9.52
Jul	29	0.00	0.00	0.00	0.00	2.63	0.43	12.63	-3.05	0.00	9.58	84.90	28.50	-10.81
Jul	30	0.88	0.00	0.00	0.88	2.63	0.43	9.58	-2.18	0.00	7.40	84.90	28.50	-11.72
Jul	31	0.00	0.00	0.00	0.00	2.63	0.43	7.40	-3.05	0.00	4.34	84.90	28.50	-12.00
Aug	1	0.00	0.00	0.00	0.00	2.45	0.43	4.34	-2.88	0.00	1.47	84.90	28.50	-12.00
Aug	2	0.00	0.00	0.00	0.00	2.45	0.43	1.47	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	3	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	4	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	5	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	6	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	7	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00

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Aug	8	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	9	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	10	6.25	0.73	0.00	6.98	2.45	0.43	0.00	4.10	0.00	4.10	84.90	28.50	-10.49
Aug	11	0.00	0.00	0.00	0.00	2.45	0.43	4.10	-2.88	0.00	1.23	84.90	28.50	-11.70
Aug	12	0.63	0.00	0.00	0.63	2.45	0.43	1.23	-2.25	0.00	0.00	84.90	28.50	-12.00
Aug	13	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	14	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	15	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	16	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	17	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	18	0.00	0.00	0.00	0.00	2.45	0.43	0.00	-2.88	0.00	0.00	84.90	28.50	-12.00
Aug	19	0.50	0.00	0.00	0.50	2.45	0.43	0.00	-2.38	0.00	0.00	84.90	28.50	-12.00
Aug	20	5.00	0.22	0.00	5.22	2.45	0.43	0.00	2.34	0.00	2.34	84.90	28.50	-11.08
Aug	21	7.50	1.53	0.00	9.03	2.45	0.43	2.34	6.15	0.00	8.49	84.90	28.50	-8.94
Aug	22	2.50	0.00	0.00	2.50	2.45	0.43	8.49	-0.38	0.00	8.11	84.90	28.50	-9.10
Aug	23	9.38	3.22	0.00	12.60	2.45	0.43	8.11	9.72	0.00	17.83	84.90	28.50	-5.95
Aug	24	0.38	0.00	0.00	0.38	2.45	0.43	17.83	-2.50	0.00	15.33	84.90	28.50	-7.00
Aug	25	0.00	0.00	0.00	0.00	2.45	0.43	15.33	-2.88	0.00	12.45	84.90	28.50	-8.21
Aug	26	0.00	0.00	0.00	0.00	2.45	0.43	12.45	-2.88	0.00	9.58	84.90	28.50	-9.42
Aug	27	0.00	0.00	0.00	0.00	2.45	0.43	9.58	-2.88	0.00	6.70	84.90	28.50	-10.64
Aug	28	0.00	0.00	0.00	0.00	2.45	0.43	6.70	-2.88	0.00	3.82	84.90	28.50	-11.85
Aug	29	2.13	0.00	0.00	2.13	2.45	0.43	3.82	-0.75	0.00	3.07	84.90	28.50	-12.00
Aug	30	0.00	0.00	0.00	0.00	2.45	0.43	3.07	-2.88	0.00	0.20	84.90	28.50	-12.00
Aug	31	0.00	0.00	0.00	0.00	2.45	0.43	0.20	-2.88	0.00	0.00	84.90	28.50	-12.00
Sep	1	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	2	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	3	0.38	0.00	0.00	0.38	2.32	0.43	0.00	-2.37	0.00	0.00	84.90	28.50	-12.00
Sep	4	0.38	0.00	0.00	0.38	2.32	0.43	0.00	-2.37	0.00	0.00	84.90	28.50	-12.00
Sep	5	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	6	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	7	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	8	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	9	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	10	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	11	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	12	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	13	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	14	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	15	8.75	2.59	0.00	11.34	2.32	0.43	0.00	8.60	0.00	8.60	84.90	28.50	-9.14
Sep	16	0.00	0.00	0.00	0.00	2.32	0.43	8.60	-2.75	0.00	5.85	84.90	28.50	-10.30
Sep	17	0.00	0.00	0.00	0.00	2.32	0.43	5.85	-2.75	0.00	3.10	84.90	28.50	-11.45
Sep	18	4.25	0.05	0.00	4.30	2.32	0.43	3.10	1.56	0.00	4.66	84.90	28.50	-10.81
Sep	19	0.00	0.00	0.00	0.00	2.32	0.43	4.66	-2.75	0.00	1.92	84.90	28.50	-11.97
Sep	20	0.00	0.00	0.00	0.00	2.32	0.43	1.92	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	21	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	22	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	23	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	24	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	25	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	26	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	27	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	28	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	29	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Sep	30	0.00	0.00	0.00	0.00	2.32	0.43	0.00	-2.75	0.00	0.00	84.90	28.50	-12.00
Oct	1	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	2	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	3	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	4	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	5	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00

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Oct	6	10.63	4.67	0.00	15.30	1.73	0.43	0.00	13.15	0.00	13.15	84.90	28.50	-7.84
Oct	7	7.88	1.82	0.00	9.69	1.73	0.43	13.15	7.54	0.00	20.69	84.90	28.50	-5.19
Oct	8	0.00	0.00	0.00	0.00	1.73	0.43	20.69	-2.15	0.00	18.54	84.90	28.50	-6.10
Oct	9	0.00	0.00	0.00	0.00	1.73	0.43	18.54	-2.15	0.00	16.39	84.90	28.50	-7.00
Oct	10	0.00	0.00	0.00	0.00	1.73	0.43	16.39	-2.15	0.00	14.23	84.90	28.50	-7.91
Oct	11	0.00	0.00	0.00	0.00	1.73	0.43	14.23	-2.15	0.00	12.08	84.90	28.50	-8.82
Oct	12	0.00	0.00	0.00	0.00	1.73	0.43	12.08	-2.15	0.00	9.93	84.90	28.50	-9.72
Oct	13	0.00	0.00	0.00	0.00	1.73	0.43	9.93	-2.15	0.00	7.78	84.90	28.50	-10.63
Oct	14	3.50	0.00	0.00	3.50	1.73	0.43	7.78	1.35	0.00	9.13	84.90	28.50	-10.06
Oct	15	0.00	0.00	0.00	0.00	1.73	0.43	9.13	-2.15	0.00	6.98	84.90	28.50	-10.97
Oct	16	0.00	0.00	0.00	0.00	1.73	0.43	6.98	-2.15	0.00	4.83	84.90	28.50	-11.87
Oct	17	0.00	0.00	0.00	0.00	1.73	0.43	4.83	-2.15	0.00	2.68	84.90	28.50	-12.00
Oct	18	0.00	0.00	0.00	0.00	1.73	0.43	2.68	-2.15	0.00	0.53	84.90	28.50	-12.00
Oct	19	0.00	0.00	0.00	0.00	1.73	0.43	0.53	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	20	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	21	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	22	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	23	0.00	0.00	0.00	0.00	1.73	0.43	0.00	-2.15	0.00	0.00	84.90	28.50	-12.00
Oct	24	19.63	21.54	0.00	41.16	1.73	0.43	0.00	39.01	0.00	39.01	84.90	28.50	-1.89
Oct	25	0.63	0.00	0.00	0.63	1.73	0.43	39.01	-1.53	0.00	37.48	84.90	28.50	-2.54
Oct	26	0.00	0.00	0.00	0.00	1.73	0.43	37.48	-2.15	0.00	35.33	84.90	28.50	-3.44
Oct	27	0.00	0.00	0.00	0.00	1.73	0.43	35.33	-2.15	0.00	33.18	84.90	28.50	-4.35
Oct	28	0.00	0.00	0.00	0.00	1.73	0.43	33.18	-2.15	0.00	31.03	84.90	28.50	-5.25
Oct	29	0.00	0.00	0.00	0.00	1.73	0.43	31.03	-2.15	0.00	28.88	84.90	28.50	-6.16
Oct	30	0.00	0.00	0.00	0.00	1.73	0.43	28.88	-2.15	0.00	26.73	84.90	28.50	-7.06
Oct	31	0.00	0.00	0.00	0.00	1.73	0.43	26.73	-2.15	0.00	24.58	84.90	28.50	-7.97
Nov	1	11.88	6.36	0.00	18.24	1.21	0.44	24.58	16.59	0.00	41.17	84.90	28.50	-2.85
Nov	2	22.50	28.95	0.00	51.45	1.21	0.44	41.17	49.81	6.07	84.90	84.90	28.50	1.83
Nov	3	0.00	0.00	0.00	0.00	1.21	0.44	84.90	-1.65	0.00	83.25	84.90	28.50	1.70
Nov	4	0.00	0.00	0.00	0.00	1.21	0.44	83.25	-1.65	0.00	81.60	84.90	28.50	1.56
Nov	5	0.00	0.00	0.00	0.00	1.21	0.44	81.60	-1.65	0.00	79.96	84.90	28.50	1.43
Nov	6	0.00	0.00	0.00	0.00	1.21	0.44	79.96	-1.65	0.00	78.31	84.90	28.50	1.30
Nov	7	0.00	0.00	0.00	0.00	1.21	0.44	78.31	-1.65	0.00	76.66	84.90	28.50	1.17
Nov	8	0.00	0.00	0.00	0.00	1.21	0.44	76.66	-1.65	0.00	75.01	84.90	28.50	1.04
Nov	9	0.00	0.00	0.00	0.00	1.21	0.44	75.01	-1.65	0.00	73.37	84.90	28.50	0.91
Nov	10	0.00	0.00	0.00	0.00	1.21	0.44	73.37	-1.65	0.00	71.72	84.90	28.50	0.77
Nov	11	0.00	0.00	0.00	0.00	1.21	0.44	71.72	-1.65	0.00	70.07	84.90	28.50	0.64
Nov	12	0.00	0.00	0.00	0.00	1.21	0.44	70.07	-1.65	0.00	68.42	84.90	28.50	0.51
Nov	13	0.00	0.00	0.00	0.00	1.21	0.44	68.42	-1.65	0.00	66.78	84.90	28.50	0.38
Nov	14	0.00	0.00	0.00	0.00	1.21	0.44	66.78	-1.65	0.00	65.13	84.90	28.50	0.25
Nov	15	0.00	0.00	0.00	0.00	1.21	0.44	65.13	-1.65	0.00	63.48	84.90	28.50	0.11
Nov	16	1.88	0.00	0.00	1.88	1.21	0.44	63.48	0.23	0.00	63.71	84.90	28.50	0.13
Nov	17	11.25	5.49	0.00	16.74	1.21	0.44	63.71	15.09	0.00	78.80	84.90	28.50	1.03
Nov	18	7.63	1.62	0.00	9.24	1.21	0.44	78.80	7.60	1.49	84.90	84.90	28.50	1.55
Nov	19	0.00	0.00	0.00	0.00	1.21	0.44	84.90	-1.65	0.00	83.25	84.90	28.50	1.42
Nov	20	25.00	36.08	0.00	61.08	1.21	0.44	83.25	59.43	57.78	84.90	84.90	28.50	4.00
Nov	21	3.00	0.00	0.00	3.00	1.21	0.44	84.90	1.35	1.35	84.90	84.90	28.50	4.00
Nov	22	63.88	200.33	0.00	264.21	1.21	0.44	84.90	262.56	262.56	84.90	84.90	28.50	4.00
Nov	23	29.50	50.33	0.00	79.83	1.21	0.44	84.90	78.18	78.18	84.90	84.90	28.50	4.00
Nov	24	2.88	0.00	0.00	2.88	1.21	0.44	84.90	1.23	1.23	84.90	84.90	28.50	4.00
Nov	25	0.00	0.00	0.00	0.00	1.21	0.44	84.90	-1.65	0.00	83.25	84.90	28.50	3.87
Nov	26	0.00	0.00	0.00	0.00	1.21	0.44	83.25	-1.65	0.00	81.60	84.90	28.50	3.74
Nov	27	0.00	0.00	0.00	0.00	1.21	0.44	81.60	-1.65	0.00	79.96	84.90	28.50	3.60
Nov	28	0.00	0.00	0.00	0.00	1.21	0.44	79.96	-1.65	0.00	78.31	84.90	28.50	3.47
Nov	29	0.00	0.00	0.00	0.00	1.21	0.44	78.31	-1.65	0.00	76.66	84.90	28.50	3.34
Nov	30	2.50	0.00	0.00	2.50	1.21	0.44	76.66	0.85	0.00	77.51	84.90	28.50	3.41
Dec	1	0.63	0.00	0.00	0.63	0.95	0.41	77.51	-0.73	0.00	76.78	84.90	28.50	3.35
Dec	2	0.00	0.00	0.00	0.00	0.95	0.41	76.78	-1.36	0.00	75.42	84.90	28.50	3.24
Dec	3	0.00	0.00	0.00	0.00	0.95	0.41	75.42	-1.36	0.00	74.06	84.90	28.50	3.13

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Dec	4	0.00	0.00	0.00	0.00	0.95	0.41	74.06	-1.36	0.00	72.70	84.90	28.50	3.02
Dec	5	0.00	0.00	0.00	0.00	0.95	0.41	72.70	-1.36	0.00	71.34	84.90	28.50	2.92
Dec	6	0.63	0.00	0.00	0.63	0.95	0.41	71.34	-0.73	0.00	70.61	84.90	28.50	2.86
Dec	7	4.38	0.07	0.00	4.45	0.95	0.41	70.61	3.09	0.00	73.70	84.90	28.50	3.10
Dec	8	0.00	0.00	0.00	0.00	0.95	0.41	73.70	-1.36	0.00	72.34	84.90	28.50	2.99
Dec	9	0.00	0.00	0.00	0.00	0.95	0.41	72.34	-1.36	0.00	70.98	84.90	28.50	2.88
Dec	10	0.00	0.00	0.00	0.00	0.95	0.41	70.98	-1.36	0.00	69.62	84.90	28.50	2.77
Dec	11	0.00	0.00	0.00	0.00	0.95	0.41	69.62	-1.36	0.00	68.26	84.90	28.50	2.66
Dec	12	0.00	0.00	0.00	0.00	0.95	0.41	68.26	-1.36	0.00	66.90	84.90	28.50	2.56
Dec	13	0.38	0.00	0.00	0.38	0.95	0.41	66.90	-0.98	0.00	65.92	84.90	28.50	2.48
Dec	14	0.00	0.00	0.00	0.00	0.95	0.41	65.92	-1.36	0.00	64.56	84.90	28.50	2.37
Dec	15	0.00	0.00	0.00	0.00	0.95	0.41	64.56	-1.36	0.00	63.20	84.90	28.50	2.26
Dec	16	0.63	0.00	0.00	0.63	0.95	0.41	63.20	-0.73	0.00	62.47	84.90	28.50	2.20
Dec	17	0.00	0.00	0.00	0.00	0.95	0.41	62.47	-1.36	0.00	61.11	84.90	28.50	2.09
Dec	18	0.00	0.00	0.00	0.00	0.95	0.41	61.11	-1.36	0.00	59.75	84.90	28.50	1.98
Dec	19	0.00	0.00	0.00	0.00	0.95	0.41	59.75	-1.36	0.00	58.39	84.90	28.50	1.88
Dec	20	0.00	0.00	0.00	0.00	0.95	0.41	58.39	-1.36	0.00	57.03	84.90	28.50	1.77
Dec	21	0.00	0.00	0.00	0.00	0.95	0.41	57.03	-1.36	0.00	55.67	84.90	28.50	1.66
Dec	22	0.00	0.00	0.00	0.00	0.95	0.41	55.67	-1.36	0.00	54.31	84.90	28.50	1.55
Dec	23	3.00	0.00	0.00	3.00	0.95	0.41	54.31	1.64	0.00	55.95	84.90	28.50	1.68
Dec	24	12.50	7.29	0.00	19.79	0.95	0.41	55.95	18.43	0.00	74.38	84.90	28.50	2.75
Dec	25	0.00	0.00	0.00	0.00	0.95	0.41	74.38	-1.36	0.00	73.03	84.90	28.50	2.64
Dec	26	0.00	0.00	0.00	0.00	0.95	0.41	73.03	-1.36	0.00	71.67	84.90	28.50	2.53
Dec	27	0.00	0.00	0.00	0.00	0.95	0.41	71.67	-1.36	0.00	70.31	84.90	28.50	2.42
Dec	28	0.00	0.00	0.00	0.00	0.95	0.41	70.31	-1.36	0.00	68.95	84.90	28.50	2.31
Dec	29	0.00	0.00	0.00	0.00	0.95	0.41	68.95	-1.36	0.00	67.59	84.90	28.50	2.20
Dec	30	1.88	0.00	0.00	1.88	0.95	0.41	67.59	0.52	0.00	68.11	84.90	28.50	2.25
Dec	31	0.00	0.00	0.00	0.00	0.95	0.41	68.11	-1.36	0.00	66.75	84.90	28.50	2.14

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Attachment F
Sample Performance Bond

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Performance Bond

Bond No. _____ **Penal Sum _____**

Know All Men By These Presents,

That we, **[name]** of **[address]** (hereinafter called the Principal), as Principal, and **[bonding company]** with an office at **[address]**, a corporation duly organized under the laws of the State of **[state]** (hereinafter called the "Surety"), as Surety, are held and firmly bound unto either, as evidenced by the signature below, **[obligee]** (hereinafter called the "Obligee"), as Obligee, up to the maximum penal sum of **[amount] ($amount)** (hereinafter called the "Maximum Penal Sum"), for the payment of which we, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal, acting as the mitigation services agent and contractor for **[permittee]** ("**permittee**"), will be responsible for implementation of the permittee-responsible mitigation plan at the **[Site Name Permittee-Responsible Mitigation Plan]** (the "PRM Plan") to compensate for ***unavoidable impacts to wetlands associated with U.S. Army Corps of Engineers (USACE)*** ***[permit number]*** and PRM Plan are hereby referred to and made a part hereof as if fully set forth herein.

WHEREAS, **[permittee]** has applied for Permits for such activities from USACE, and the USACE has granted the necessary permit(s).

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bounden Principal shall i) complete construction of the wetland restoration specified in the PRM plan and ii) demonstrate compliance with the success criteria required in the PRM Plan, then this obligation shall be null and void; otherwise shall remain in full force and effect, subject, however, to the following conditions:

1) Upon successful completion of construction and approval of an as-built report, the Penal Sum shall be reduced by **$[amount]** (**amount**) to a new Penal Sum of **$[amount]** (**amount**). For purposes of determining approval, approval shall mean written or emailed approval, or lack of a negative response for a 60 (sixty) day period following the filing of the as-built report (monitoring report).

2) The Penal Sum shall reduce in a scheduled fashion over the remainder of ten (10) monitoring years:

3) Obligee will issue a full and final release of this Bond when i) the final success criteria, as defined in the PRM Plan, are met, or ii) other security, in the amount of and covering the same obligations stated herein, is posted with the Obligee. For purposes of determining approval of final success criteria approval shall mean written or emailed approval, or lack of a negative response for a 30 (thirty) day period following the filing of the monitoring report.

4) The Surety's obligation under this bond shall arise after the Obligee has notified the Principal in and of their failure to abide by the terms and conditions of the PRM Plan. Upon notice of the Principal' s Default under PRM Plan, the Surety may take one of the following actions:

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a) Remedy the Default of the Principal to the full satisfaction of the Obligee by a date certain determined by the Obligee, or

b) Immediately tender to the Obligee' s designee that portion of the penal sum that the Obligee determines and is due and owing and necessary to remedy the default, or

c) If Principal is still in good standing with Obligee, arrange for the Principal's performance under the Agreement, or

d) In the event that the Surety fails to respond within thirty (30) business days to the Obligee's notice of default, or to honor commitments to the full satisfaction of the Obligee under a), b) or c) above of this section, the remaining portion of the full penal sum may, at the election of the Obligee, immediately become due and owing and paid to the Obligee's designee.

5) Surety shall have no obligation to the Principal, the Obligee or any other person or entity for any loss suffered by the Principal, the Obligee or any other person or entity by reason of acts or omission which are or could be covered by the Principal's general liability insurance, products liability insurance, completed operations insurance or any other insurance.

6) The Surety hereby waives notice for any alteration or extension of time made by the U.S. Army Corps of Engineers.

NOTWITHSTANDING ANYTHING CONTAINED IN THE AGREEMENT TO THE CONTRARY, THE LIABILITY OF THE PRINCIPAL AND SURETY UNDER THIS BOND IS LIMITED TO THE TERM BEGINNING THE **XXXX** DAY OF **XXXXXXX**, 20**XX**, AND ENDING THE **XXXX** DAY OF **XXXXXXX**, 20**XX**, AND ANY EXTENSTIONS OR RENEWALS OF THE REFERENCED AGREEMENT SHALL BE COVERED UNDER THIS BOND ONLY WHEN CONSENTED TO IN WRITING BY THE SURETY. IT IS FURTHER AGREED THAT REFUSAL BY THE SURETY TO EXTEND THE TERMS OF THIS BOND SHALL NOT CONSTITUTE A DEFAULT BY THE PRINCIPAL AND SHALL NOT GIVE RISE TO A CLAIM OR DEMAND AGAINST THE SURETY UNDER THIS BOND.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Obligee named herein, or their heirs, executors, administrators or successors.

Sealed with our seals and dated this **XXXX** day of **XXXXXXX** 20 **XX**

Principal:

By:_____
Name and Title

Surety:

By:_____
Name and Title

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Attachment G
Financial Assurances

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Cost Structure: PRM for Landmark Development Project

PRM for Landmark Development Project (Minus hours and per diem)

Site Variables			
Site Acreage (Conservation Servitude)			15.74
Restoration Acreage			12.50
Seedlings (Total)			2,275
Monitoring Plots			3

Construction Item Cost	Unit	Unit Cost	Total Cost
Project Management			$ 973.35
Earthwork			$ 43,560.12
Site Prep: Bush hog, spraying (invasives), burning	Acre	$ 478.87	$ 5,985.82
Fencing	Acre	$ 1,213.80	$ 15,172.50
Hydrology: Low water crossings and building materials			$ 20,732.76
Initial planting/plant matierals/seeding	Acre	$ 2,606.72	$ 32,584.02
As-built/survey work			$ 1,790.88
Contingency			$ 10,000.00
Total			***$ 130,799.45***

Establishment Item Cost- Through Year 10	Unit	Unit Cost	Total Cost
Project Management			$ 2,804.76
Bush hog maintenance (mowing)			$ 1,648.33
Prescribed Burning			$ 3,418.80
Maintenance of roads			$ 7,754.24
Hydrology: Low water crossings repair and maintenance			$ 24,760.00
Adaptive management: Replanting/plant materials/seeding	Acre	$ 400.11	$ 5,001.36
Adaptive management: Spot spraying (invasives)	Acre	$ 873.19	$ 13,744.08
Monitoring			$ 5,322.24
Contingency			$ 8,000.00
Total			***$ 72,453.81***

Total $ 203,253.26

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Long-term Management Cost Structure: PRM for Landmark Development Project

Task	Detail	Unit	# Units	Cost/Unit	Cost	Frequency (Years)	Subtotal	Contingency (10%)	Overhead (22%)	Total
Monitoring site visit	Labor - Biologist (inc. prep & travel)	Hours	2	$ 35	$ 70	1	$ 70	$ 7	$ -	$ 77
Annual report and LTMP update	Labor - Biologist	Hours	2	$ 35	$ 70	1	$ 70	$ 7	$ -	$ 77
Invasive plant control	Labor - Field (inc. prep & travel)	Hours	4	$ 25	$ 100	3	$ 33	$ 3	$ -	$ 37
	Chemicals	Gallons	2	$ 62	$ 124	3	$ 41	$ 4	$ 10	$ 55
Prescribed Burn	Labor - Field	Hours	8	$ 25	$ 200	7	$ 29	$ 3	$ -	$ 31
	Labor - Biologist	Hours	4	$ 35	$ 140	7	$ 20	$ 2	$ -	$ 22
Fence/gate maintenance	Fencing materials	Feet	2,000	$ 2	$ 4,000	15	$ 267	$ 27	$ 65	$ 358
	Gate	Item	2	$ 175	$ 350	15	$ 23	$ 2	$ 6	$ 31
	Labor - Assistant (inc. prep & travel)	Hours	10	$ 30	$ 300	15	$ 20	$ 2	$ -	$ 22
Low water crossing, ditch, and berm maintenance	Rock	Tons	2	$ 100	$ 200	10	$ 20	$ 2	$ 5	$ 27
	Labor - Assistant (inc. prep & travel)	Hours	10	$ 30	$ 300	10	$ 30	$ 3	$ 7	$ 40
	Excavator	Day Rate	0.5	$ 620	$ 310	10	$ 31	$ 3	$ 8	$ 42
	Diesel	Gallons	20	$ 5	$ 100	10	$ 10	$ 1	$ 2	$ 13
Road maintenance	Rock	Tons	2	$ 100	$ 200	10	$ 20	$ 2	$ 5	$ 27
	Labor - Assistant (inc. prep & travel)	Hours	10	$ 30	$ 300	10	$ 30	$ 3	$ 7	$ 40
	Dozer	Day Rate	0.5	$ 620	$ 310	10	$ 31	$ 3	$ 8	$ 42
	Diesel	Gallons	25	$ 5	$ 125	10	$ 13	$ 1	$ 3	$ 17
Mowing non-mitigaiton areas and trash removal	Labor - Assistant (inc. prep & travel)	Hours	2	$ 30	$ 60	1	$ 60	$ 6	$ 15	$ 81
	Tractor	Day Rate	0.25	$ 250	$ 63	1	$ 63	$ 6	$ 15	$ 84
	Diesel	Gallons	10	$ 5	$ 50	1	$ 50	$ 5	$ 12	$ 67
Vehicle mileage	2 trips/year at 5 miles each	Miles	20	$ 0.7	$ 14	1	$ 14	$ 1	$ 3	$ 18
Field vehicle (ATV)	Used at 10 sites	Item	0.1	$ 10,000	$ 1,000	8	$ 125	$ 13	$ 28	$ 165
	Maintenance/fuel	gallons	5	$ 5	$ 25	1	$ 25	$ 3	$ 6	$ 33
Project management	Labor - Project Manager	Hours	4	$ 50	$ 200	1	$ 200	$ 20	$ -	$ 220
Accounting	Labor - Accountant	Hours	1	$ 35	$ 35	1	$ 35	$ 4	$ -	$ 39
Taxes	$3 per acre	Acres	15.74	$ 3	$ 47	1	$ 47	$ 5	$ -	$ 52
									Total Annual Cost	**$ 1,717**

Annual Cost at year 11 (following construction and 10-year monitoring)	$ 2,135
Value of Fund required at Year 11	$ 99,283
Value of Fund required at Year 1	$ 60,220

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Attachment H
Reference Sites

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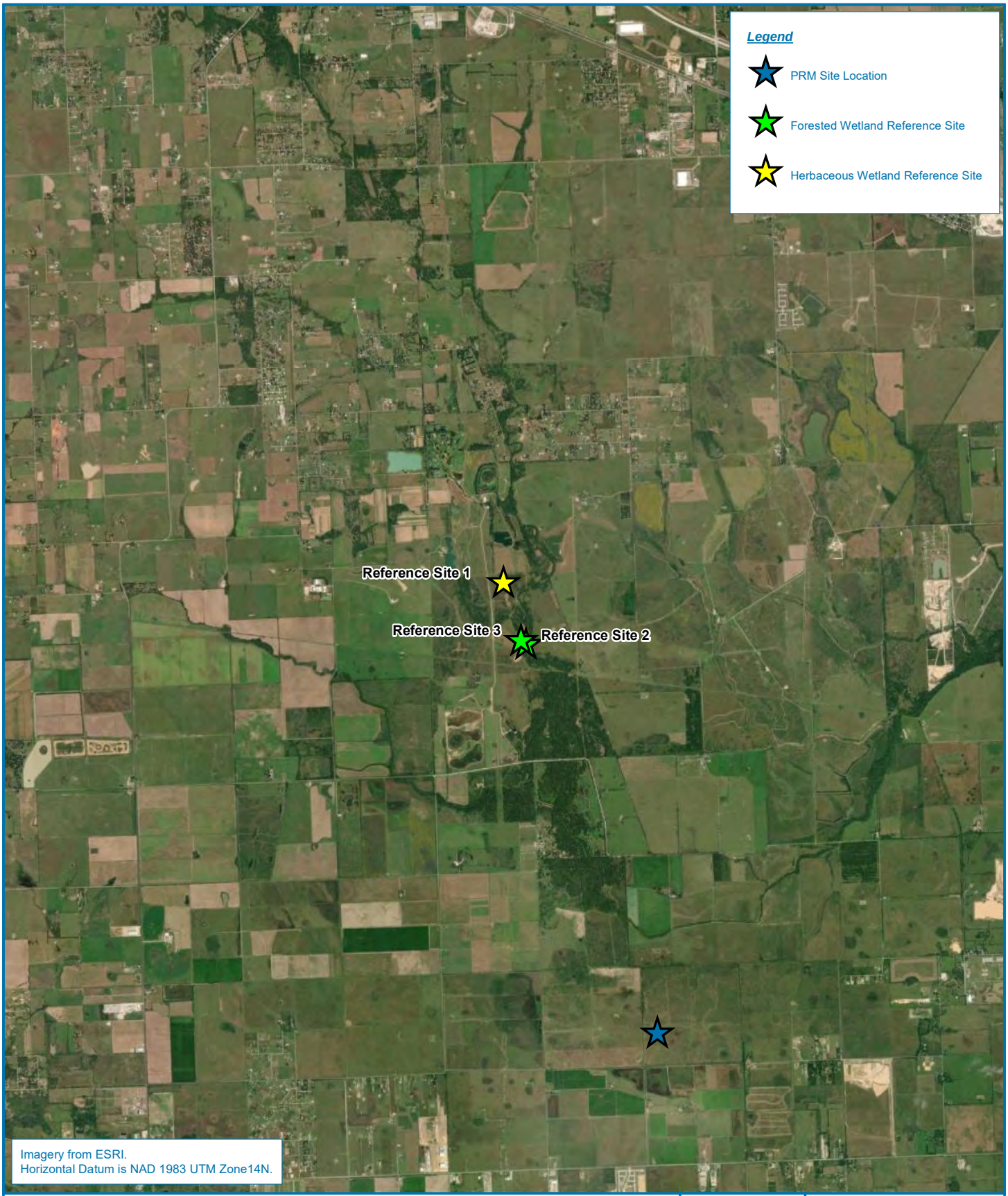

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Attachment H Reference Sites

Wetland Reference Sites Locations

Waller County, Texas

Date: 11/22/2021

Drawn by: AJR

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Reference Sites HGMi Scoring

One herbaceous and two forested wetland reference sites were identified in order to determine post-restoration scores for the wetland re-establishment areas on the PRM Site. These sites were chosen due to similar ecoregions, climatic patterns, hydrologic patterns, and location near the PRM Site. The herbaceous reference site (Reference Site 1) is located approximately 4 miles northwest of the PRM Site. This reference site was assessed using the *Riverine Herbaceous/Shrub HGMi* model. The forested reference sites (Reference Sites 2 and 3) are located at the confluence of Snake and Mound Creek that join to Cypress Creek, just upstream of the PRM Site. These reference sites were assessed using the *Riverine Forested HGMi* model. These sites were utilized to predict amount of functional uplift anticipated by proposed restoration activities on the PRM Site and dictate appropriate plantings and anticipated hydroperiods. Scores are summarized in Table 1 below.

Though the reference sites were chosen based on their similarity to the PRM Site, past conditions, buffers, soils, and some hydrology factors (based on watershed area) do differ from the PRM Site. Therefore, each reference site's metric score may not exactly match those of the PRM Site's restored wetlands but provide an anticipatory range of HGMi scoring variable sub index. The reference sites were used as a range of variance in hydrology, plants, and biotic structures which can be found within the ecoregion. RES used proposed management actions and measured functional values at the reference sites to predict the result of anticipated land management practices on the PRM Site for the projected HGMi scores the PRM Site will generate.

Table 1. Reference Sites HGMi Values and Functional Capacity Index Values

Variable	Variable Sub Index		
	Herbaceous	Forested	
	Reference Site 1	Reference Site 2	Reference Site 3
V_{dur}	1	0.75	0.75
V_{freq}	1	1	1
V_{topo}	0.4	0.4	0.4
V_{cwd}	-	0.5	0.5
V_{wood}	0.25	1	0.75
V_{tree}	-	0.8	0.5
V_{rich}	-	0.8	1
V_{basal}	-	0.6	1
$V_{density}$	-	1	0.6
V_{mid}	0.25	0.75	0.75
V_{herb}	1	0.5	0.5
$V_{detritus}$	1	0.5	0.5
V_{redox}	1	1	1
V_{sorpt}	1	1	0.5
$V_{connect}$	1	0.75	0.75
TSSW FCI	0.72	0.74	0.69
MPAC FCI	0.58	0.71	0.7
RSEC FCI	0.76	0.84	0.74

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Reference Sites Species List

Reference Site 1 - Herbaceous Wetland	
Scientific Name	**Common Name**
Marsilea vestita	Hairy water-clover
Persicaria hydropiperoides	Swamp smartweed
Cyperus virens	Green flatsedge
Ludwigia repens	Water primrose
Sagittaria lancifolia	Lanceleaf arrowhead
Coreopsis tinctoria	Plains coreopsis
Juncus torreyi	Torrey's rush
Physostegia angustifolia	Narrow-leaved obedient plant
Symphyotrichum subulatum	Eastern annual saltmarsh aster
Eriochloa contracta	Prairie cupgrass
Alternanthera philoxeroides	Alligatorweed
Rhynchospora caduca	Anglestem beaksedge
Bidens frondosa	Common beggar-ticks
Setaria parviflora	Marsh bristlegrass
Eleocharis montevidensis	Sand spikerush
Schoenoplectus californicus	Giant bulrush
Rhynchospora corniculata	Shortbristle horned beaksedge
Phyla nodiflora	Texas frogfruit
Pontderia cordata	Pickerelweed
Diodia virginiana	Buttonweed
Carex scoparia	Brooom sedge
Cyperus entrerianus	Deeprooted sedge
Thalia dealbata	Powdery alligator flag

Reference Site 2 - Forested Wetland	
Scientific Name	**Common Name**
Ulmus americana	American Elm
Quercus nigra	Water oak
Celtis laevigata	Sugarberry
Ligustrum sinense	Chinaberry
Ulmus crassifolia	Cedar elm
Ilex vomitoria	Yaupon
Chasmanthium latifolium	Inland sea oats
Carex cherokeensis	Cherokee sedge
Viola sororia	Common blue violet
Campsis radicans	Trumpet creeper
Smilax bona-nox	Saw greenbriar

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Reference Sites Species List

Reference Site 3 - Forested Wetland	
Scientific Name	**Common Name**
Celtis laevigata	Sugarberry
Fraxinus pennsylvanica	Green ash
Ulmus americana	American elm
Triadica sebifera	Chinese tallow
Ulmus crassifolia	Cedar elm
Ligustrum sinense	Chinese privet
Ilex coriacea	Gallberry
Persicaria hydropiperoides	Swamp smartweed
Cyperus sp	sedge
Chasmanthium latifolium	Inland sea oats
Elymus virginicus	Virginia wild rye
Boehmeria cylindrica	Smallspike false nettle
Vitis mustangensis	Mustang grape

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WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Herbaceous Wetland Site County: Waller Sampling Date: June 21, 2021
Applicant/Owner: RES State: Texas Sample Point: Reference Site 1
Investigator(s): H. Thompson and A. Roman Section, Township, Range: -
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): Concave Slope (%): 0-5
Subregion (LRR or MLRA): 150A Lat: 29.96045 Long: -95.895553 Datum: WGS 84
Soil Map Unit Name: Tomball loam, 0 to 1 percent slopes, frequently ponded NWI Classification: PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No	
Hydric Soil Present?	Yes **X**	No	**Is the Sampled Area**
Wetland Hydrology Present?	Yes **X**	No	**within a Wetland?** **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- **X** Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- **X** Algal Mat or Crust (B4)
- **X** Iron Deposits (B5)
- **X** Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots(C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- **X** Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- **X** Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- **X** FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes **X**	No	Depth (inches): **nput Dept**
Water Table Present?	Yes	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes	No **X**	Depth (inches): **>20**

Wetland Hydrology Present? **Yes X** **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

Received 24 January 2022

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **Reference Site 1**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0		20% of total cover: 0	
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0		20% of total cover: 0	
Shrub Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0		20% of total cover: 0	
Herb Stratum (Plot size: 30 ft.)			
1. *Marsilea vestita*	25	Yes	OBL
2. *Symphyotrichum subulatum*	25	Yes	OBL
3. *Eriochloa contracta*	20	Yes	FAC
4. *Ludwigia repens*	10	No	OBL
5. *Alternanthera philoxeroides*	10	No	OBL
6. *Panicum hemitomon*	5	No	OBL
7. *Persicaria hydropiperoides*	5	No	OBL
8. *Cyperus odoratus*	5	No	FACW
9. *Coreopsis tinctoria*	5	No	FAC
10. *Rhynchospora caduca*	5	No	OBL
11. *Bidens frondosa*	5	No	FACW
	120 = Total Cover		
50% of total cover: 60		20% of total cover: 24	
Woody Vine Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**85**	x 1 =	**85**
FACW species	**10**	x 2 =	**20**
FAC species	**25**	x 3 =	**75**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**120** (A)		**180** (B)

Prevalence Index = B/A = **1.50**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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SOIL

Sampling Point: **Reference Site 1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/1	98	10YR 3/6	2	C	PL	Silt Loam	
6-12	10YR 6/1	93	10YR 3/6	7	C	PL	Sandy Loam	
12-20	10YR 4/1	93	10YR 3/6	7	C	PL	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- **X** Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes **X** **No** ___

Remarks:

A positive indication of hydric soil was observed.

Received 24 January 2022

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Forested Wetland Site 1 County: Waller Sampling Date: June 15, 2021
Applicant/Owner: RES State: Texas Sample Point: Reference Site 2
Investigator(s): A. Roman and M. Genotte Section, Township, Range: -
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5
Subregion (LRR or MLRA): 150A Lat: 29.95139 Long: -95.89194 Datum: WGS 84
Soil Map Unit Name: Snakecreek fine sandy loam, 0 to 1 percent slopes, frequently flooded NWI Classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No	
Hydric Soil Present?	Yes **X**	No	**Is the Sampled Area**
Wetland Hydrology Present?	Yes **X**	No	**within a Wetland?** **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- **X** Saturation (A3)
- **X** Water Marks (B1)
- **X** Sediment Deposits (B2)
- **X** Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- **X** Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots(C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- **X** Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- **X** Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- **X** FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes **X**	No	Depth (inches): **nput Dept**

Wetland Hydrology Present? **Yes X** **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

Received 24 January 2022

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **Reference Site 2**

Tree Stratum (Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	60	Yes	FAC
2. *Quercus nigra*	25	Yes	FAC
3. *Celtis laevigata*	15	No	FACW
4.			
5.			
6.			
	100	= Total Cover	
50% of total cover:	50	20% of total cover:	20
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	
50% of total cover:	0	20% of total cover:	0
Shrub Stratum (Plot size: 30 ft.)			
1. *Ligustrum sinense*	30	Yes	FAC
2. *Ulmus crassifolia*	5	No	FAC
3. *Celtis laevigata*	5	No	FACW
4. *Ilex vomitoria*	2	No	FAC
5.			
6.			
	42	= Total Cover	
50% of total cover:	21	20% of total cover:	8.4
Herb Stratum (Plot size: 30 ft.)			
1. *Chasmanthium latifolium*	20	Yes	FAC
2. *Carex cherokeensis*	20	Yes	FACW
3. *Viola sororia*	3	No	FAC
4. *Campsis radicans*	2	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45	= Total Cover	
50% of total cover:	22.5	20% of total cover:	9
Woody Vine Stratum (Plot size: 30 ft.)			
1. *Campsis radicans*	20	Yes	FAC
2. *Smilax bona-nox*	7	Yes	FAC
3.			
4.			
5.			
	27	= Total Cover	
50% of total cover:	13.5	20% of total cover:	5.4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **7** (A)

Total Number of Dominant Species Across All Strata: **7** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x 1 =	**0**
FACW species	**40**	x 2 =	**80**
FAC species	**174**	x 3 =	**522**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**214** (A)		**602** (B)

Prevalence Index = B/A = **2.81**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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SOIL

Sampling Point: **Reference Site 2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-6	10YR 3/2	75	5YR 4/6	25	C	M	Clay Loam	O Horizon present
6-20	10YR 4/2	75	10YR 4/6	25	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- **X** Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes **X** **No** _____

Remarks:

A positive indication of hydric soil was observed.

Received 24 January 2022

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Forested Wetland Site 2 County: Waller Sampling Date: June 15, 2021
Applicant/Owner: RES State: Texas Sample Point: Reference Site 3
Investigator(s): A. Roman and M. Genotte Section, Township, Range: -
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5
Subregion (LRR or MLRA): 150A Lat: 29.95194 Long: -95.89278 Datum: WGS 84
Soil Map Unit Name: Snakecreek fine sandy loam, 0 to 1 percent slopes, frequently flooded NWI Classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
Are Vegetation **No**, Soil **No**, or Hydrology **No** significantly disturbed? Are "Normal Circumstances" present? Yes **X** No
Are Vegetation **No**, Soil **No**, or Hydrology **No** naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No	
Hydric Soil Present?	Yes **X**	No	**Is the Sampled Area**
Wetland Hydrology Present?	Yes **X**	No	**within a Wetland?** **Yes X** **No**

Remarks:

This point was determined to be within a wetland due to the presence of all 3 wetland criteria.

HYDROLOGY

Wetland hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- **X** Saturation (A3)
- **X** Water Marks (B1)
- **X** Sediment Deposits (B2)
- **X** Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- **X** Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots(C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- **X** Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- **X** Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- **X** FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes	No **X**	Depth (inches): **N/A**
Water Table Present?	Yes	No **X**	Depth (inches): **>20**
Saturation Present? (includes capillary fringe)	Yes **X**	No	Depth (inches): **nput Dept**

Wetland Hydrology Present? **Yes X** **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

Received 24 January 2022

VEGETATION (Five Strata) - Use scientific names of plants.

Sampling Point: **Reference Site 3**

	Absolute % cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. *Celtis laevigata*	40	Yes	FACW
2. *Fraxinus pennsylvanica*	30	Yes	FACW
3. *Ulmus americana*	15	No	FAC
4. *Triadica sebifera*	5	No	FAC
5.			
6.			
	90 = Total Cover		
50% of total cover: 45		20% of total cover: 18	
Sapling Stratum (Plot size: 30 ft.)			
1. *None Observed*			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0		20% of total cover: 0	
Shrub Stratum (Plot size: 30 ft.)			
1. *Triadica sebifera*	10	Yes	FAC
2. *Ulmus crassifolia*	5	Yes	FAC
3. *Ligustrum sinense*	5	Yes	FAC
4. *Ilex coriacea*	3	No	FACW
5.			
6.			
	23 = Total Cover		
50% of total cover: 11.5		20% of total cover: 4.6	
Herb Stratum (Plot size: 30 ft.)			
1. *Persicaria hydropiperoides*	50	Yes	OBL
2. *Cyperus*	20	Yes	#N/A
3. *Chasmanthium latifolium*	20	Yes	FAC
4. *Ulmus crassifolia*	2	No	FAC
5. *Elymus virginicus*	2	No	FAC
6. *Boehmeria cylindrica*	2	No	FACW
7.			
8.			
9.			
10.			
11.			
	96 = Total Cover		
50% of total cover: 48		20% of total cover: 19.2	
Woody Vine Stratum (Plot size: 30 ft.)			
1. *Smilax coriacea*	5	Yes	FAC
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **8** (A)

Total Number of Dominant Species Across All Strata: **8** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**50**	x 1 =	**50**
FACW species	**75**	x 2 =	**150**
FAC species	**69**	x 3 =	**207**
FACU species	**0**	x 4 =	**0**
UPL species	**0**	x 5 =	**0**
Column Totals:	**194** (A)		**407** (B)

Prevalence Index = B/A = **2.10**

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤ 3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (if observed, list morphological adaptations below).

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

Received 24 January 2022

SOIL

Sampling Point: **Reference Site 3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-6	10YR 5/1	70	7.5YR 3/4	30	C	M	Sandy Loam	
6-20	10YR 5/1	70	7.5YR 3/4	30	C	M	Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- **X** Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes **X** **No** ___

Remarks:

A positive indication of hydric soil was observed.

Received 24 January 2022

Photographic Log

Project: Reference Sites		**Location:** Waller County, Texas	
Reference Site 1	Herbaceous Wetland Site	Reference Site 1	Herbaceous Wetland Site
			
Reference Site 1	Herbaceous Wetland Site	Reference Site 1	Herbaceous Wetland Site
			

Received 24 January 2022

Photographic Log

Project: Reference Sites		**Location:** Waller County, Texas	
Reference Site 2	Forested Wetland Site 1	Reference Site 2	Forested Wetland Site 1

Reference Site 2	Forested Wetland Site 1	Reference Site 2	Forested Wetland Site 1

Received 24 January 2022

Photographic Log

Project: Reference Sites		**Location:** Waller County, Texas	
Reference Site 3	Forested Wetland Site 2	Reference Site 3	Forested Wetland Site 2
			
Reference Site 3	Forested Wetland Site 2	Reference Site 3	Forested Wetland Site 2