



GOLDER
MEMBER OF WSP

REPORT

Conceptual Wetland and Waterbody Mitigation Plan

Atascocita Rd Campus Project

Submitted to:

USACE Galveston District
Regulatory Division

Submitted by:

Golder Associates Inc.
14950 Heathrow Forest Parkway, Suite 280, Houston, Texas, USA 77032

+1 281 821-6868

21500737

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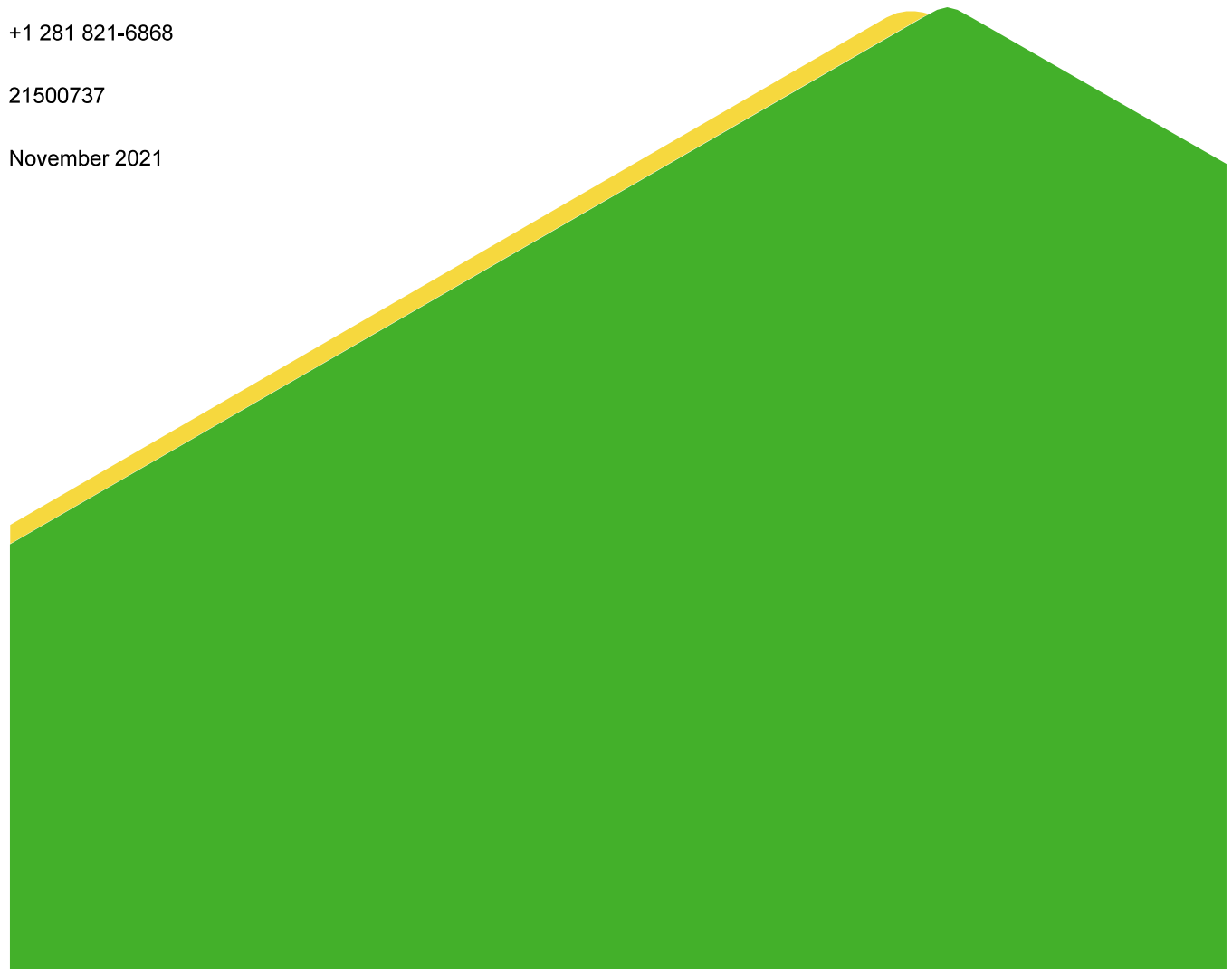


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1.0 INTRODUCTION

Waste Management of Texas, Inc. (WMTX) is proposing to construct the Atascocita Rd Campus Project (Project) located on Atascocita Road in Humble, Harris County, Texas. The Project will be used as a central location for storing equipment and performing maintenance work on equipment. Golder Associates Inc. (Golder), a member of WSP, performed environmental surveys on April 16-17, 2020 within the Project area to delineate the boundaries of all wetlands and waterbodies. U.S. Army Corps of Engineers (USACE) functional assessments, including Hydrogeomorphic Assessment (HGM) forms and Stream Assessment Data Forms, were completed for each stream and wetland delineated within the Project Area. The HGM forms are provided as Attachment 3 of the permit application and the Stream Assessment Data Forms are provided as Attachment 4 of the permit application.

2.0 PROJECT IMPACTS

The Project would result in temporary and permanent impacts to wetlands, streams, and manmade ponds located throughout the site. Approximately 1.13 acres of palustrine emergent (PEM) wetlands, 0.62-acre of palustrine forested (PFO) wetlands, and 0.16-acre of palustrine scrub-shrub (PSS) wetlands would be permanently filled during construction of the Project. Additionally, the Project would result in permanent impacts on approximately 2,103 linear feet of ephemeral stream channels. All streams proposed to be impacted by the Project were classified as ephemeral during the initial field survey. Permanent impacts to the manmade ponds on the site will total approximately 0.16-acre.

Golder reviewed historic aerial imagery of the Project area to document the past land use and modifications that have been made to the topography and hydrology. Aerial imagery dating back to 1944 shows the Project area historically consisted of pastureland with oil and gas infrastructure present on the earliest available imagery in 1944. A number of roads were developed in the Project area to access the oil and gas infrastructure, several of which have an adjacent ditch. Several impoundments were created near the oil and gas infrastructure, which have developed into small wetlands and ponds. Recent excavation throughout the Project area has resulted in the creation of manmade ponds. Some of these ponds have connections to wetlands while others are isolated with no connection to other features.

Modifications to the hydrology include excavated ditches that drain into the intermittent stream SG1001 on the eastern side of the Project area. Historical aerial imagery shows a drainage ditch (which has since developed into wetlands and open waters) was present on the western boundary of the Project area that drained into other features off-site. None of the streams delineated onsite appear to be natural, as all are channelized, linear in shape, and are located adjacent to existing road or areas that were historically used as roads. All streams impacted by the Project are classified as having ephemeral flow regimes. Maps showing the Project design are provided as Appendix A.

2.1.1 Wetland HGM Assessments

Wetland functional capacity index (FCI) scores were assigned using the HGM forms (Attachment 3 of the permit application) to determine the pre-construction and post-construction Functional Capacity Units (FCU) needed to offset the permanent impacts. Table 2 shows the FCU scores for each of the three categories that will be used to determine the total number of credits needed for purchasing wetland mitigation credits from a USACE approved mitigation bank.

Table 1: Wetland FCU Scores

Wetland ID	Temporary Storage of Water	Maintain Plant & Animal	Removal of Elements
PFO Wetlands			
WG1001_PFO	0.02	0.02	0.02
WG1002_PFO	0.04	0.03	0.04
WG1003_PFO	0.01	0.01	0.01
WG1004_PFO	0.01	0.01	0.01
WG1006_PFO	0.04	0.03	0.04
WG1012_PFO	0.02	0.02	0.02
WG1016_PFO	0.14	0.13	0.16
WG1017_PFO	0.04	0.04	0.05
PSS Wetlands			
WG1001_PSS	0.00	0.01	0.00
WG1005_PSS	0.00	0.04	0.02
WG1009_PSS	0.01	0.07	0.04
PEM Wetlands			
WG1001_PEM	0.00	0.03	0.02
WG1008_PEM	0.02	0.18	0.13
WG1009_PEM	0.03	0.34	0.23
WG1016_PEM	0.01	0.13	0.09
WG1016_PEM_B	0.00	0.02	0.02
Total FCU Values			
PFO Wetlands	0.31	0.28	0.36
PSS Wetlands	0.01	0.12	0.07
PEM Wetlands	0.06	0.70	0.49

2.1.2 Stream Evaluations

Stream Assessment Data Forms (Attachment 4 of the permit application) for Level 1 streams were completed to evaluate the Reach Condition Index (RCI) scores and determine the required amount of stream credits to offset the Project impacts. Table 1 below lists the impacts streams, the total linear feet of permanent impacts, the stream's RCI score, and the impact factor for Project impacts.

Table 2: Stream Impact Summary

Stream ID and Transect	RCI Score	Impact Factor	Impact Length (Linear Feet)
SG1003 T1	3.00	5	259
SG1004 T1	2.38	5	39
SG1005 T1	3.00	5	318
SG1005 T2	3.00	5	
SG1006 T1	2.00	1	391
SG1006 T2	2.06	1	
SG1007 T1	2.75	1	239
SG1007 T2	3.25	1	
SG1008 T1	2.63	4	151
SG1009 T1	1.38	3	267
SG1009 T2	1.38	3	
SG1010 T1	1.38	3	208
SG1010 T2	1.38	3	
SG1012 T1	2.00	3	231
Total Linear Feet of Impacts			2,103

3.0 MITIGATION

WMTX plans to purchase credits to offset impacts on wetlands and perform on-site mitigation for stream and pond impacts. Additional details on the mitigation plans are discussed in detail below.

3.1 Purchase of Wetland Credits

WMTX is proposing to purchase wetland mitigation credits from the Gin City Mitigation Bank. The Project is located within the secondary service area of the Gin City Mitigation Bank, which has applied a multiplier value of 1.5 to the credits required for purchase. A search of the USACE Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) shows that only PFO wetland credits are available for purchase for the Project area. No mitigation banks serve the Project location that offer PEM and/or PSS wetland credits.

The PSS and PFO wetlands at the site are considered low quality due to the previous site disturbance and presence of invasive species. WMTX has minimized impacts on aquatic features at the site to the best extent practicable, including PEM wetlands. WMTX has re-designed the facility footprint to reduce impacts on PEM wetlands since mitigation banks serving the Project location do not offer PEM or PSS credits for purchase. PEM wetlands that have been avoided to reduce impacts include WG1010_PEM and WG1015_PEM, which total approximately 1.5 acres. All PSS wetlands on site were determined to be low quality and were dominated by Chinese tallow (*Triadica sebifera*), an invasive species. Purchasing the available PFO wetland mitigation credits would replace the low quality PEM and PSS wetlands at the Project site with high quality wetlands dominated by native species at the Gin City Mitigation Bank.

3.2 On-Site Stream Construction

WMTX is proposing to offset the impacts on the ephemeral ditches by constructing new channels on site rather than purchasing credits from a mitigation bank. Based on the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS), the Project appears to be located within the primary service area of the Katy Prairie Stream Mitigation Bank. However, recent communication with the bank sponsor determined that there are currently not enough available stream credits for anticipated Project impacts. No other stream mitigation banks service the Project's location with a primary or secondary service area.

Approximately 4,931 linear feet of stream channels would be constructed around the perimeter of the facility in two stream sections. Both stream channels would connect to retention pond located on the east side of the Project. Maps showing the stream channel locations that will be constructed onsite are provided as Appendix B. WMTX proposes to use the bankfull bench creation, lay back bank, stream bank plantings, preservation, and buffer planting stream improvement techniques to achieve 3.05 credits per linear foot of streambank creation. Based on these stream improvement techniques and the Galveston District Determination of Compensation guidance, approximately 15,039.55 stream credits would be constructed on-site to offset the 13,675.55 stream debits that would be impacted from the construction of the Project (See Attachment 4 of the permit application for the Stream Assessment Data Forms). Monitoring events would take place for ten years following the completion of the onsite stream mitigation. Monitoring will be performed by qualified personnel and will ensure all mitigation design methods are successful. An annual report will be submitted to the USACE Galveston district to show the progress of the restoration and conditions of the constructed channel over the course of the monitoring period.

3.3 On-Site Pond Construction

WMTX proposes to construct approximately 6 to 7 acres of retention ponds at a depth of 10 to 15 feet onsite to offset the 0.16-acre of permanent impacts that would result from the construction of the Project to ponds onsite. The constructed ponds would serve as stormwater retention basins to contain the stormwater outflows generated by new impervious surfaces associated with the Project. The retention ponds would receive stormwater through drainage systems as well as the on-site streams that are proposed to offset Project impacts. No monitoring events or reporting is proposed for the onsite pond mitigation.

4.0 CONCLUSION

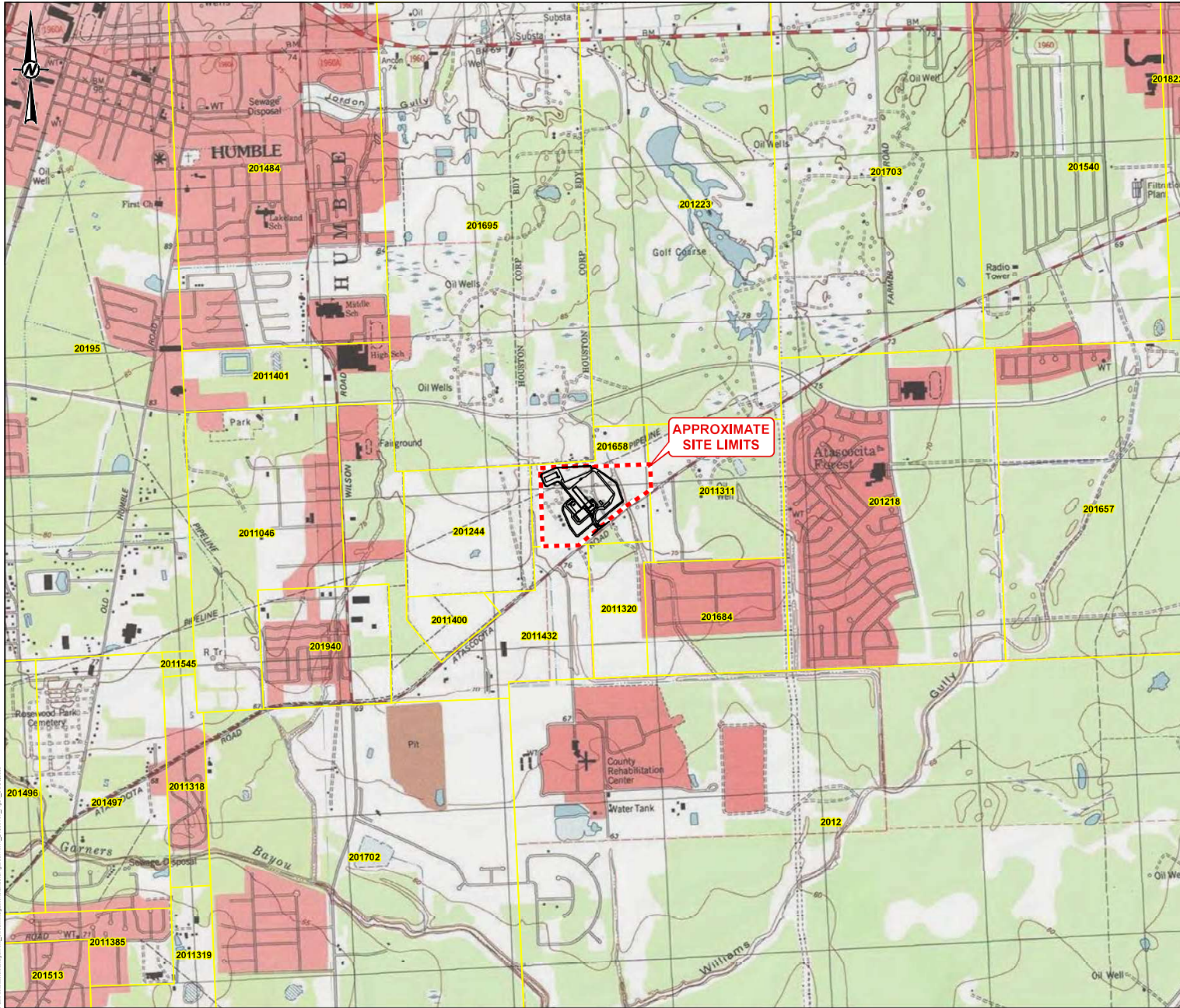
WMTX proposes to mitigate impacts by purchasing PFO wetland credits from Gin City Mitigation Bank and constructing streams and ponds onsite and to offset the impacts to wetlands and waterbodies and comply with Section 404 of the Clean Water Act. A secondary service area multiplier of 1.5 has been applied to the required wetland credits due to the Project being located within the Gin City Mitigation Bank secondary service area.

The streams created onsite would achieve a mitigation value of 15,039.55 credits, according to the USACE Galveston District Determination of Compensation guidance, which would offset the permanent impacts on stream channels resulting from the construction of the Project. The on-site streams created to mitigate the Project impacts will be monitored for a total of ten years to ensure a successful mitigation.

Approximately 6 to 7 acres of retention ponds would be constructed on-site, which would mitigate the 0.16-acre of permanent impacts on the manmade ponds. The retention ponds would be excavated to a depth of 10 to 15 feet and would be fed by stormwater runoff and the stream constructed (Stream A on Appendix B) to mitigate for impacts. No monitoring events are proposed for the retention ponds that will offset the impacts to manmade ponds.

Appendix A

Site Layout Maps



LEGEND

- APPROXIMATE SITE LIMITS
- ORIGINAL TEXAS LAND SURVEY
- PROPOSED SITE LAYOUT

KEY MAP

The Woodlands
MAP EXTENT
Houston
Beaumont

REFERENCE

1. TOPOGRAPHIC BACKGROUND: ESRI BASEMAP SERVICES, USGS 1:24,000 TOPOGRAPHIC QUADRANGLES SHOWN: HARMASTON, HUMBLE, MOONSHINE HILL, AND MAEDAN.

CLIENT

WASTE MANAGEMENT

PROJECT

STREAM MITIGATION

TITLE

SITE LOCATION MAP
USGS TOPOGRAPHIC MAP

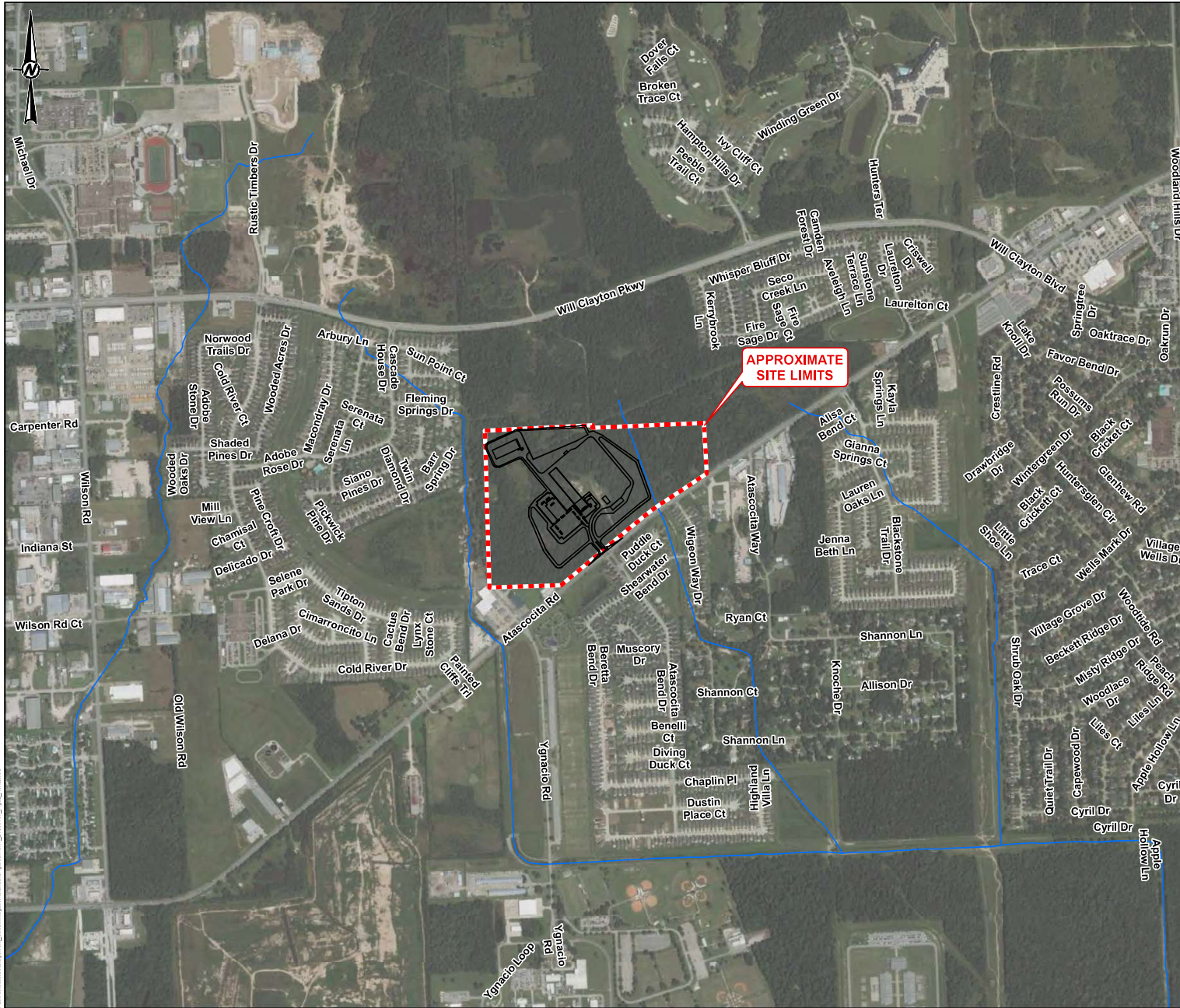
CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-11-12
PREPARED	JAM
DESIGN	JAM
REVIEW	XX
APPROVED	XX

PROJECT No.
21500737

FIGURE
1



LEGEND

- APPROXIMATE SITE LIMITS
- STREAM/RIVER
- PROPOSED SITE LAYOUT

KEY MAP

REFERENCE

- AERIAL IMAGERY: ESRI PROVIDED BASEMAP SERVICE, VIVID, MAXAR, IMAGERY COLLECTED 10/2/2020.
- STREAMS DATASET: NATIONAL HYDROGRAPHY DATASET (NHD), USGS.

CLIENT
WASTE MANAGEMENT

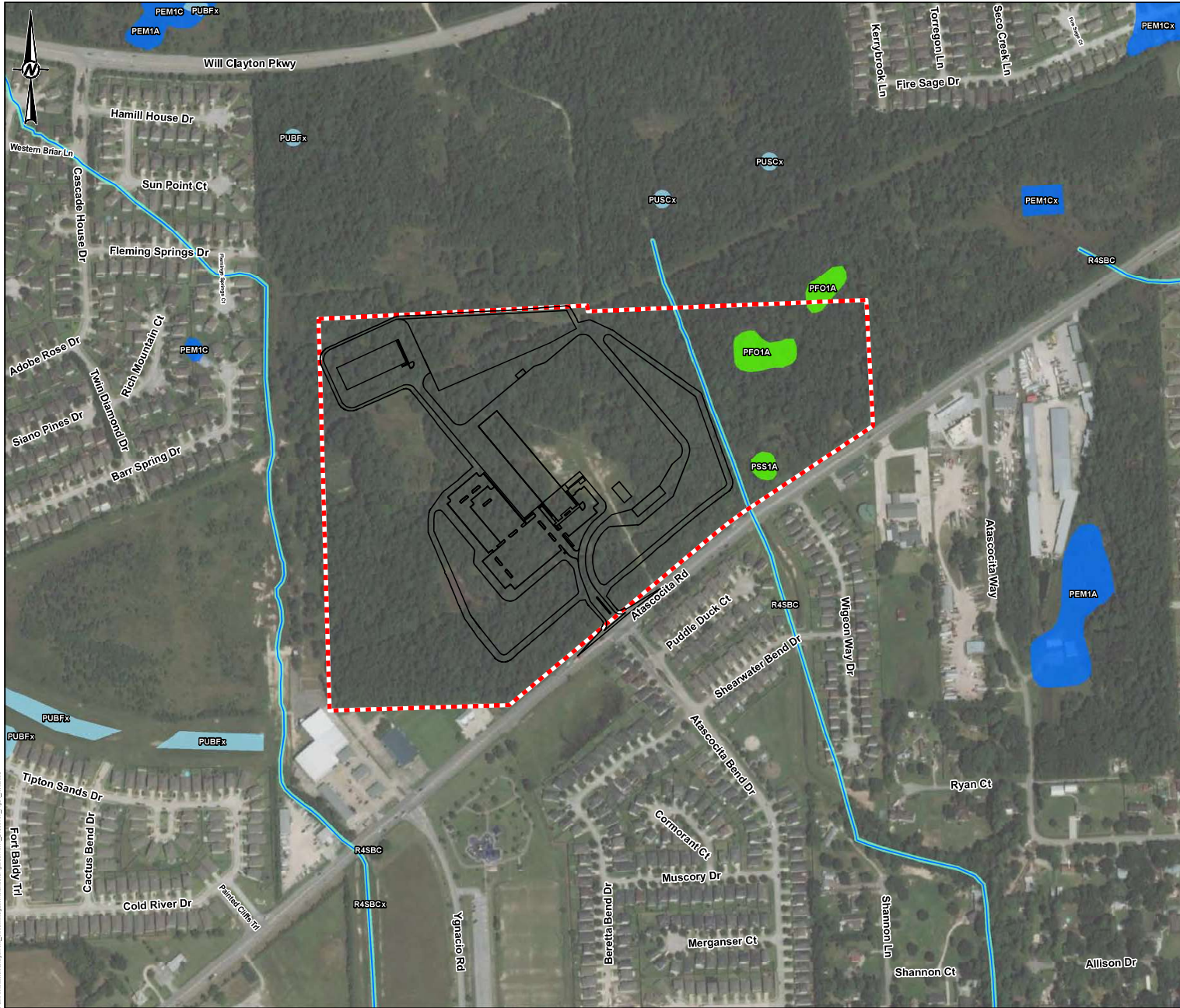
PROJECT
STREAM MITIGATION

TITLE
SITE LOCATION MAP
AERIAL IMAGERY

CONSULTANT	YYYY-MM-DD	2021-11-12
GOLDER MEMBER OF WSP	PREPARED	JAM
	DESIGN	JAM
	REVIEW	XX
	APPROVED	XX

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FIGURE
2



LEGEND

APPROXIMATE SITE LIMITS

STREAM/RIVER

PROPOSED SITE LAYOUT

NWI WETLAND TYPE

FRESHWATER EMERGENT WETLAND

FRESHWATER FORESTED/SHRUB WETLAND

FRESHWATER POND

RIVERINE

0 200 400 800 Feet

REFERENCE

1. AERIAL IMAGERY: ESRI PROVIDED BASEMAP SERVICE, VIVID, MAXAR, IMAGERY COLLECTED 10/2/2020.

2. WETLANDS DATASET: NATIONAL WETLANDS INVENTORY (NWI), US FISH AND WILDLIFE SERVICE.

3. STREAMS DATASET: NATIONAL HYDROGRAPHY DATASET (NHD), USGS.

CLIENT
WASTE MANAGEMENT

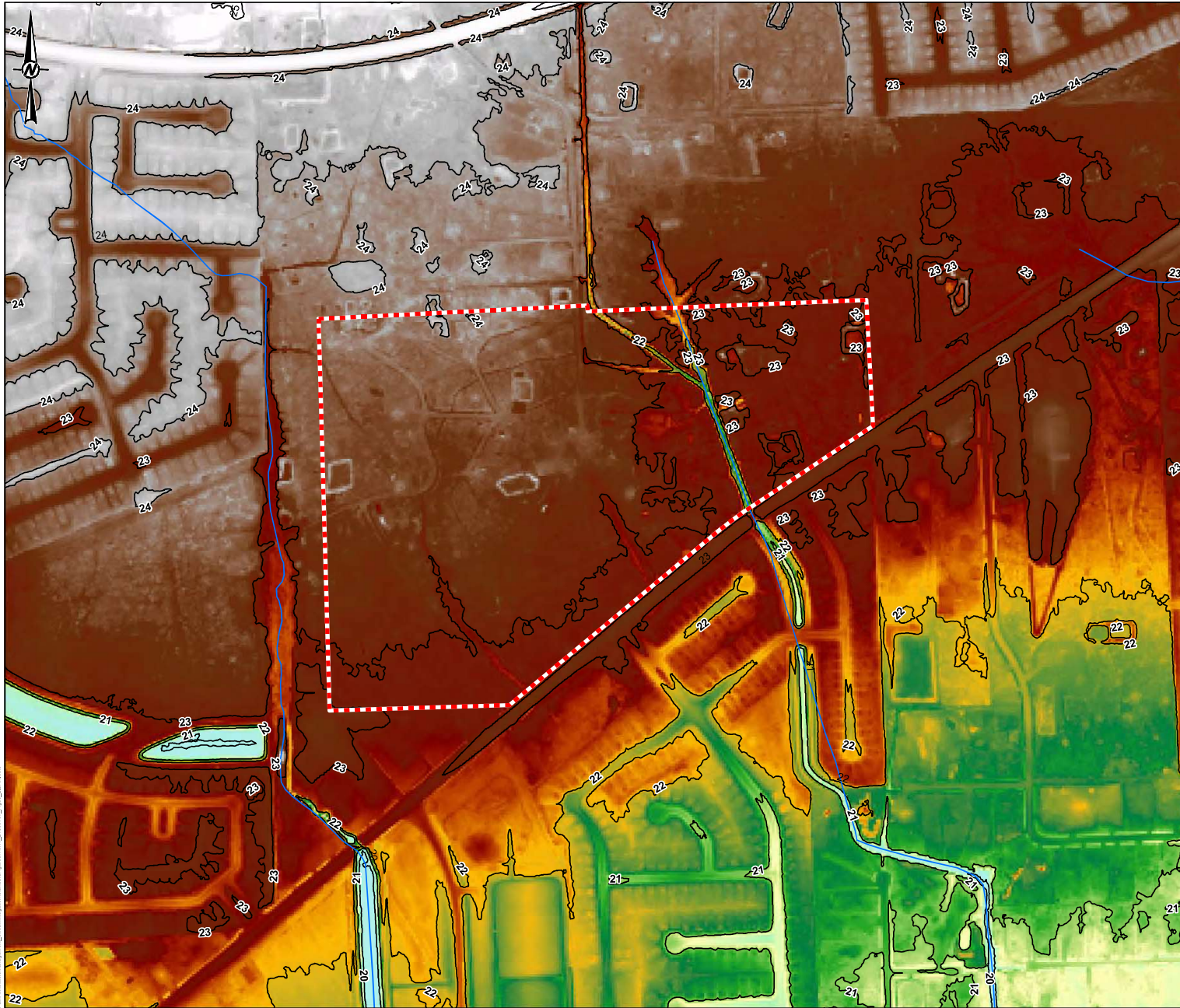
PROJECT
STREAM MITIGATION

TITLE
NATIONAL WETLAND INVENTORY MAP

CONSULTANT	YYYY-MM-DD	2021-11-12
GOLDER MEMBER OF WSP	PREPARED	JAM
	DESIGN	JAM
	REVIEW	XX
	APPROVED	XX

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21500737

FIGURE
4



LEGEND

- APPROXIMATE SITE LIMITS
- STREAM/RIVER
- TOPOGRAPHIC CONTOUR (1-FT INTERVAL)

SURFACE ELEVATION (FT-AMSL)

- HIGH : 25
- LOW : 19

0 200 400 800 Feet

REFERENCE

1. TOPOGRAPHY: U.S. GEOLOGICAL SURVEY, USGS LIDAR POINT CLOUD TX_COASTALREGION_2018_A18: U.S. GEOLOGICAL SURVEY, DATA DOWNLOADED 11/11/2021.
2. STREAMS DATASET: NATIONAL HYDROGRAPHY DATASET (NHD), USGS.

CLIENT
WASTE MANAGEMENT

PROJECT
STREAM MITIGATION

TITLE
LIDAR MAP

CONSULTANT	YYYY-MM-DD	2021-11-11
 GOLDER MEMBER OF WSP	PREPARED	JAM
	DESIGN	JAM
	REVIEW	XX
	APPROVED	XX

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FIGURE
6

Appendix B

Conceptual Mitigation Stream Design Maps

