RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF TOMBALL, TEXAS, DETERMINING THAT A FEE SIMPLE TITLE IS NEEDED TO BE ACQUIRED FROM PETER HILDRETH AND SYLVIA HILDRETH FOR THE CONSTRUCTION, OPERATION, AND MAINTENANCE OF A DETENTION POND AS A PART OF THE TOMBALL HILLS DRAINAGE PROJECT FOR THE CITY OF TOMBALL, TEXAS; AND AUTHORIZING THE INSTITUTION OF EMINENT DOMAIN PROCEEDINGS.

* * * * *

WHEREAS, Shannon Quadros, attorney for Peter and Sylvia Hildreth notified the City in a letter dated October 2, 2024 that the property his property adjacent to the property described herein experiences significant high water and flooding, a true and correct copy of that letter is attached hereto as Exhibit "A" and incorporated herein by this reference for all purposes;

WHEREAS, upon receipt of the October 2, 2024 correspondence, the City Council of the City of Tomball, Texas authorized a feasibility study to be performed by engineering company. A true and correct copy of the feasibility study performed by Ardurra Group, Inc. is attached hereto as Exhibit "B" and incorporated herein by this reference for all purposes;

WHEREAS, the City Council of the City of Tomball, Texas now finds and determines that public convenience and necessity requires the City of Tomball to acquire a fee simple title over and across tracts of land containing Lot Forty Three (43) in Block Four (4) of REPLAT-REVISION 1, TOMBALL HILLS ADDITION for the construction, operation, and maintenance of a detention pond as part of the Tomball Hills Drainage Project in the City of Tomball, Texas; and

WHEREAS, the City of Tomball, through its duly authorized representatives, has negotiated with the owners of the Land for the purchase of same for the purpose stated herein and has been unable to agree with such owners as to the fair cash market value thereof and damages, if any; and

WHEREAS, the City Council of the City of Tomball has authorized the City Manager or his designee to make an offer to the owners of the Land for the purchase of same based upon its appraised value, and such offer has been made and the owner has refused to accept such final offer; now therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TOMBALL, TEXAS:

Section 1. The facts and recitals set forth in the preamble of this resolution are hereby found to be true and correct.

Section 2. The City Council of the City of Tomball finds that a bona fide offer has been made by duly authorized representatives of the City for the acquisition of a fee simple title across the herein described Land, and that said offer was not accepted, and that the only way for the City of Tomball to acquire such interest in said tract of land is through the filing of eminent domain proceedings.

Section 3. The City Council hereby finds and determines that a public use and necessity exists for the City of Tomball for the construction, operation, and maintenance of a detention pond as part of the Tomball Hills Drainage Project in the City of Tomball, Texas, as allowed by law, together with all necessary appurtenances, additions and improvements on, over, under, and through those certain lots, tracts or parcels of land.

Section 4. The final offer heretofore made to the owner for the purchase of the Land is in all things hereby ratified and confirmed.

Section 5. The City Attorney, or his designee, is hereby authorized to bring eminent domain proceedings on behalf of the City of Tomball under applicable provisions of law, whether provided by §251.001 of the Texas Local Government Code, as amended, Chapter 21 of the Texas Property Code, or by any other provision of law, against the owner or owners of the Land, to-wit:

Peter Hildreth and Sylvia Hildreth, or against the real and true owner, owners, claimant, or claimants if Peter Hildreth and Sylvia Hildreth are said not to be the owners of the Land.

PASSED, APPROVED, AND RESOLVED this ____ day of _____, 2025.

_____
Lori Klein Quinn
Mayor

ATTEST:

_____
Thomas Harris
City Secretary

APPROVED AS TO FORM:

_____
Loren B. Smith
City Attorney

QUADROS, MIGL & CROSBY
SKILLED • RESPONSIVE • EXPERIENCED

Shannon Quadros
Managing Shareholder
509 Branard Street
Houston, Texas 77006
Telephone: (713) 300-9662
Facsimile: (214) 731-3117
SQuadros@QMCLaw.com

October 2, 2024

Loren Smith
Olson & Olson, LLP
Via email: lsmith@olsonllp.com

Re: Details about High Water at the entrance 30702 – D TX -249, Tomball, Texas 77375 (a/k/a Hilltop Tools)

Dear Loren:

On behalf of Hilltop Tools and its owner Peter Hildreth, I am providing to the City of Tomball some additional detail of high water conditions that occur on occasion at, on, and near the entrance to Hilltop Tools located at 30702 – D TX -249, Tomball, Texas 77375.

To the best of Mr. Hildreth's recollection, Hilltop Tools has primarily experienced several high water and flooding type conditions on or about the entrance to Hilltop Tools (preventing ingress and egress from the property) during the Tax Day Flood in April 2016, during Hurricane Harvey in 2017, and one other time in 1994 (believed to the be the Great Flood of 1994 due to the remnants of Hurricane Rosa).

Below are pictures of the entrance of Hilltop Tools during the most recent two high-water events mentioned above.

Said high water events prevented safe vehicular and pedestrian access to and from the front facing entrance of Hilltop Tools. In fact, the City of Tomball rented some heavy equipment from Hilltop Tools during the Tax Day Flood and had to extract the heavy equipment through access from Camille Drive as the State Hwy. 249 facing entrance of Hilltop Tools was impassable.

I am also including via hyperlink video (below) of highwater near the entrance of Hilltop Tools after construction of Hwy 249 had been completed in the area. It is worth noting that dirt removed to create the detention ponds across Hwy 249 from Hilltop Tools was deposited immediately North of the Hilltop Tool location and has likely exacerbated the likelihood of high water at the Hilltop Tool entrance should the Tomball area inevitably experience a heavy rain event like the Tax Day Flood and Hurricane Harvey.

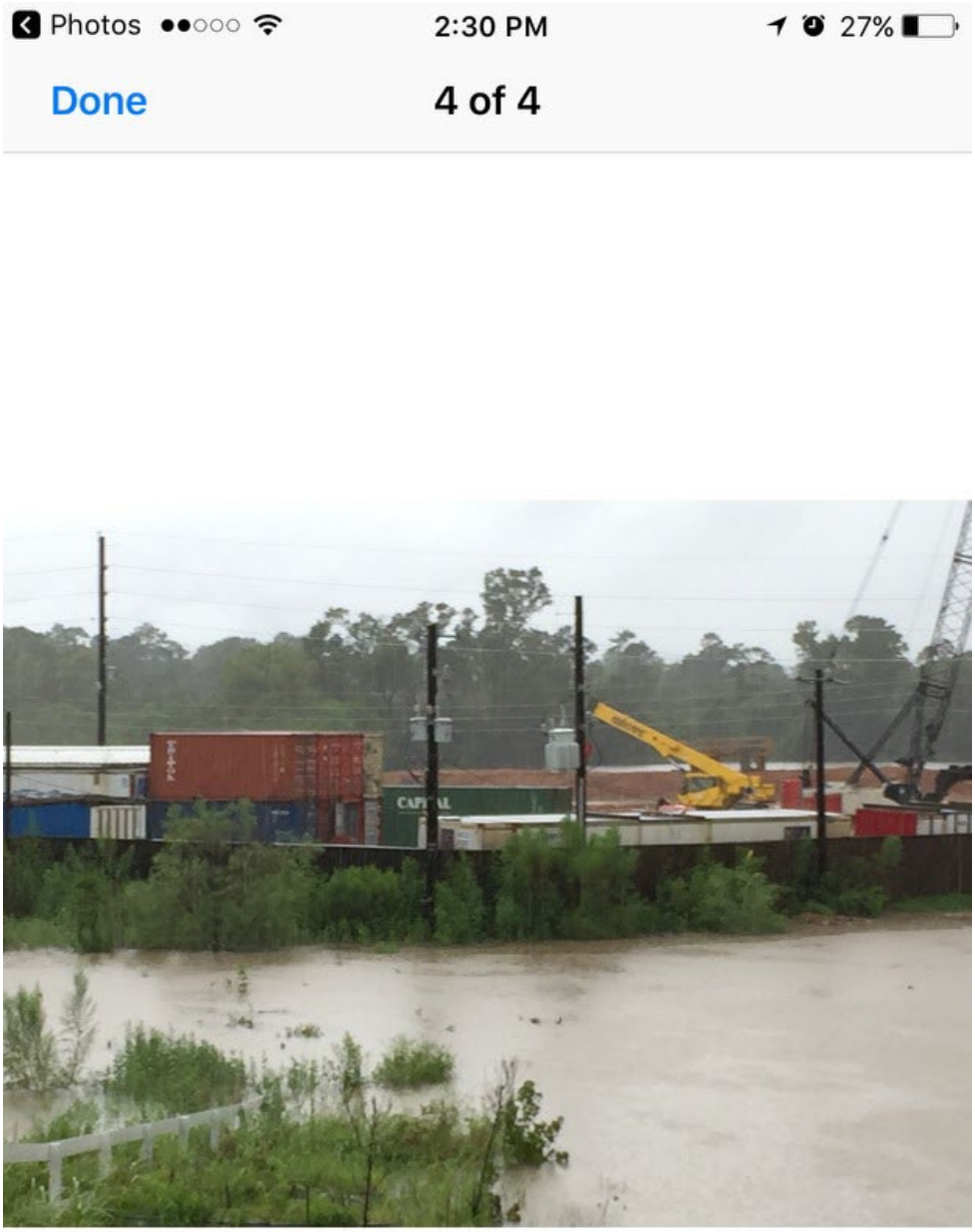
Link to video showing high water:

https://www.dropbox.com/scl/fi/mqce5tcn2acgcfx730raq/IMG_0899.MOV?rlkey=ltxcreuqrizt3pv8qfrpcvex1&st=ytupmb29&dl=0

Pictures of high water are included below:


GENERATOR
BLOWOUT SALE
LOADING/
ENTRANCE


●●●○○ T-Mobile
2:29 PM
27%
Done
2 of 2


Photos
2:30 PM
27%
Done
4 of 4


CAPITAL


GENERATOR
BLOWOUT SALE
LOADING/
UNLOADING
ENTRANCE


GENERATOR
BLOWOUT SALE
STARTING FROM $375


GENERATOR
BLOWOUT SALE
STARTING FROM $375
LOADING/
UNLOADING
ENTRANCE

Should you have any questions regarding the foregoing please do not hesitate to contact me at 713-300-9662

Sincerely,

Shannon Quadros

Counsel for Hilltop Tools and Peter Hildreth.

TOMBALL HILLS DRAINAGE AREA FEASIBILITY STUDY

August 13, 2025

8/13/2025
STATE OF TEXAS
PATRICK DONART
100036
LICENSED
PROFESSIONAL ENGINEER

ARDURRA

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Ardurra Group, Inc.
11767 Katy Freeway, Suite 1040
Houston, Texas 77079

FEASIBILITY STUDY

TITLE	**TOMBALL HILLS DRAINAGE AREA FEASIBILITY STUDY(FINAL)**		
PROJECT NO.	2025-0613-00	PREPARED BY:	DANIEL KEHRER, P.E.
DATE	MAY 15, 2025	APPROVED BY:	PATRICK DONART, P.E.
REVISED	JULY 11, 2025	REVISED BY:	PATRICK DONART, P.E.

0. EXECUTIVE SUMMARY

The City of Tomball (the City) has contracted Ardurra Group, Inc. (Ardurra) to provide a feasibility study of drainage conditions in the Tomball Hills neighborhood. Ardurra researched the project area, reviewed the current Drainage Master Plan and FEMA floodplain maps, and conducted a couple site visits. Based on this information, we were able to conduct a desktop analysis with modeling to determine several alternatives. Based on the analysis, Ardurra recommends proceeding with Alternative A with the detention pond and the advantages along existing easements. We expanded on the alternatives and reasonings later in this report.

The next step to support timely implementation of Alternative A, we recommend that the City initiate the property acquisition (HCAD parcel no. 1129570000043) process for the proposed detention pond as soon as possible. Based on Ardurra's experience with similar projects, the acquisition process may take approximately 18 to 24 months to complete. In parallel, we recommend proceeding with the detailed design and easement research for the project.

1. PROJECT BACKGROUND, LOCATION AND DESCRIPTION

The Tomball Hills neighborhood is in the northwest region of Tomball, Texas. The study area is in the northwest end of the neighborhood, specifically at the intersection of Camille Drive and Alice Lane, as well as along Camille Drive, Stella Lane and Chris Lane. The study area is bordered by wooded areas to the north, State Highway 249 (SH 249) to the west, and the rest of the neighborhood on other sides. The neighborhood has a fair amount of elevation change throughout and experiences flooding in localized areas during storm events.

2. PURPOSE AND SCOPE OF WORK

The goal of the study is to explore alternatives to reduce street flooding at the intersection of Camille Drive near Alice Lane and assess the effects on businesses along the SH 249 access road, while also limiting disruptions on Camille Drive and Stella Lane. The costs of any viable alternative solutions will be evaluated and compared to the current plan outlined in the Draft City of Tomball Drainage Master Plan (2025), along with consideration of non-cost factors such as public disruption, easements, and right-of-way impacts, to help the City decide on the best course of action.

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3. Field Investigations and Findings

A site visit was performed on April 17th, 2025, by Daniel Kehrer, P.E. and Ross Ozuna, P.E. from 4:00 – 5:00 PM. A previous visit was performed by Jeff Peters, P.E. and Patrick Donart, P.E. on January 27th, 2025, with some photos from this visit shared in the Field Investigation report. To analyze the existing conditions of the neighborhood, several specific locations were visited. Please see **Appendix B-Field Investigation Report** for an overview of the field visit findings. See **Exhibit 03** for a schematic of existing drainage pipes.

4. Project Challenges and Introduction to Alternatives

There is conflicting information between the "1978 Tomball Hills Subdivision Paving Plans" (Tomball Hills as built) as-builts provided, field observations, HCAD parcels, the 1978 plat provided and the City of Tomball GIS system (GIS system). Differences are found for the outfall from the inlet on the west end of the cul-de-sac on Camille Drive in the City of Tomball GIS system, the Tomball Hills as-built and the provided "Proposed 24-inch Storm Sewer from Camille Drive to Outfall" plan set that provides drainage utilities for the Hilltop Tool Rental business along SH 249. The Hilltop Tool Rental plan set shows a 24-inch pipe taking drainage flow from the inlet on the Camille Drive cul-de-sac and collecting flow from the Tomball Hills property into a grate inlet, with an outfall to HCAD property no. 1129570000036, eventually flowing to Spring Creek. Confirmation is needed if this has been constructed. The GIS system and Tomball Hills as built shows a 12-inch RCP outfall to a roadside ditch within TxDOT ROW along SH 249. The **Alternatives A-D** described below involve replacing the inlet on the cul-de-sac to relieve local ponding, while plugging the outfall running underneath the Hilltop Tool Rental property. If this 24-inch pipe exists, this would improve drainage conditions for both the neighborhood and the Hilltop Tool Rental property, as the drainage pipes running under the property will no longer be taking flow from the neighborhood.

The Chris Lane outfall has been investigated for feasibility to be used as an outfall for the drainage system alternatives described below. However, there is conflicting existing information for this outfall as well. The GIS system shows an 18-inch RCP outfall running to Spring Creek. Through field investigation, the downstream end of this outfall could not be located. This outfall to Spring Creek may exist, but we believe it is either buried or not in the location shown on as-builts or the GIS system. The original Tomball Hills as built shows this outfall to a roadside ditch. Therefore, the **Alternatives A, B & D** below would involve complete replacement of the outfall to Spring Creek which will involve clearing and grubbing along the outfall to Spring Creek along with identification of the existence of an easement along the 18-inch outfall.

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Alternatives A-D include a proposed 10-foot deep, 0.73 AC-FT detention pond within HCAD parcel no. 1129570000043 (Block 4, Lot 43 of the Tomball Hills Addition). This parcel will need to be acquired. This underdeveloped parcel is primarily located just outside of the floodway. All alternatives presented in this report include some of the drainage elements that were proposed in the City of Tomball Master Drainage Plan (MDP).

Each alternative encounters challenges when locating a feasible outfall point from the detention pond. Available HCAD parcel shapefiles show some difference from the provided plat for the neighborhood, dated 1978. These shapefiles have been edited slightly to reflect what is shown in the 1978 plat. Local and relevant utility and drainage easements to the project have been added and shown in **Exhibits 01-02**.

5. PROJECT ALTERNATIVES

Detailed descriptions for each alternative are described below:

Alternative A:

Please see **Exhibit 04** for **Alternative A** configuration. This alternative includes six proposed inlets at the meeting curve transition from Alice Lane to Camille Drive, as proposed in the MDP. These pipes are proposed to drain into a 30-inch RCP trunk line running along Camille Drive to the west until the end of the cul-de-sac and outfall into a proposed 0.73 AC-FT pond through a 42-inch RCP. It is recommended that the inlet on the west end of the cul-de-sac be replaced and upsized to accommodate overland flow. A 30-inch CMP outfall for the pond is proposed to run inside the 16-foot utility easement shown on the 1978 plat. However, at the point that this outfall will meet the 18-inch outfall from Chris Lane, it is assumed that an easement for this outfall must exist to Spring Creek. An easement for this outfall is not shown on the plat, so both the 18-inch outfall must be located and an existing easement confirmed, or else the easement for this outfall will need to be acquired.

Alternative B:

Please see **Exhibit 05** for **Alternative B** configuration. This alternative includes the same proposed inlets, pipes and pond found in **Alternative A** but changes the outfall configuration for the pond. This alternative proposes 30-inch CMP outfall pipes inside of the HCAD parcel no. 1129570000036 to the inlet on Chris Lane, eventually out falling to Spring Creek. However, this configuration will involve burying outfall pipes ~25-feet deep in some locations, due to the change in grade along these parcels. The same challenge connecting to the existing outfall pipe described in **Alternative A** above is present due to the location of the Chris Lane outfall.

Alternative C:

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Please see **Exhibit 06** for **Alternative C** configuration. This alternative includes the same proposed inlets, pipes and pond found in **Alternative A** but changes the outfall configuration for the pond. This alternative proposes 30" CMP outfall pipes running along existing easements to the west to the TxDOT ROW for SH 249 and eventually out falling into Spring Creek.

Alternative D:

Please see **Exhibit 07** for **Alternative D** configuration. This alternative includes the same proposed inlets, pond and inflow pipes to the pond as **Alternative A**, however the 30" CMP outfall does not meet the 18-inch outfall from Chris Lane. Instead, this outfall will run inside the full length of the 16-foot easement and turns to run inside the existing 20-foot drainage easement until Spring Creek.

Alternative E:

Please see **Exhibit 06** for **Alternative E** configuration. This alternative reflects the improvements proposed in the City of Tomball Master Drainage Plan, shown here for the comparison of costs.

6. METHODOLOGY

To analyze the drainage conditions found in the study area, a hydrological analysis was performed using methodology described in both the City of Tomball Drainage Manual and engineering judgement.

To compute hydrological flows (cfs) to drainage areas shown in **Exhibits 01-02**, the Rational Method was used. The Rational Method is described in **Figure 1** below:

$$Q = I(CA)$$

Where:
- Q = flow (cfs)
- C = watershed coefficient
- A = area (acres)
- I = rainfall intensity (inches per hour)

Figure 1. Rational Method

Weighted C values for hydrologic configuration were computed using the following criteria outlined in the City of Tomball Drainage Manual in **Figure 2** below along with HCAD parcel shapefiles to compute individual areas:

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i. The Run-Off Coefficient C values in the Rational Method Formula will vary based on the land use. Land use types and C-values which can be used are as follows:

Land Use Type	Run-off Coefficient (C)
Residential Districts	
Lots more than 3/4 acre	0.35
Lots 1/4 - 3/4 acre	0.45
Lots less than 1/4 acre	0.55
Multi-Family areas	
Less than 20 Service Units/Acre	0.65
20 Service Units/Acre or Greater	0.80
Business Districts	0.80
Industrial Districts	
Light Areas	0.65
Heavy Areas	0.75
Railroad Yard Areas	0.30
Parks/Open Areas	0.18

ii. Alternatively, the Run-Off Coefficient C in the Rational Method Formula can be calculated from the equation:

$C = 0.6ia + 0.2$

Where: C = watershed coefficient
ia = impervious area/total area

Figure 2. C values for Land Use

The time of concentration (min.) calculation to compute the rainfall intensity for drainage areas shown is described in **Figure 3** below:

b. Determination of Time of Concentration:

Time of Concentration can be calculated from the following formula:

$$TC = 10A^{0.1761} + 15$$

Where: TC = time of concentration (minutes)
A = subarea (acres)

Figure 3. Time of Concentration calculation

Calculation of rainfall intensity(in/hr) is found through the equation and coefficients described in **Figure 4** below:

$$I = \frac{b}{(t_c + d)^e}$$

Coefficient	50 % AEP 2-Year	20 % AEP 5-Year	10 % AEP 10-Year	4 % AEP 25-Year	2 % AEP 50-Year	1 % AEP 100-Year	0.2 % AEP 500-Year
Region 1							
e	0.7372	0.7058	0.6819	0.6446	0.6170	0.5870	0.5111
b (in.)	48.27	51.78	54.26	54.97	54.84	53.93	50.89
d (min.)	9.30	8.19	7.44	6.27	5.45	4.53	2.69

Figure 4. Intensity calculation

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The resulting existing and proposed flows for the drainage areas shown in **Exhibits 01-02** are shown in **Tables 1 & 2** below:

DA_ID	AREA (AC)	C	Tc (min)	i (in/hr)							Q (CFS)						
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
EX_CMD	2.33	0.55	26.61	3.45	4.23	4.90	5.79	6.46	7.17	9.06	4.41	5.42	6.27	7.41	8.27	9.18	11.61
EX_CL	0.93	0.60	24.87	3.57	4.38	5.07	5.99	6.68	7.41	9.34	1.99	2.45	2.83	3.34	3.73	4.14	5.21
EX_STL	22.55	0.59	32.31	3.09	3.80	4.40	5.22	5.84	6.49	8.27	41.12	50.54	58.60	69.43	77.64	86.38	110.02

Table 1: Existing Drainage Area Calculations

DA_ID	AREA (AC)	C	Tc (min)	i (in/hr)							Q (CFS)						
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
PR_CMD	22.72	0.58	32.33	3.09	3.80	4.40	5.22	5.83	6.49	8.27	40.71	50.04	58.02	68.74	76.87	85.52	108.93
PR_CL	0.93	0.6	24.87	3.57	4.38	5.07	5.99	6.68	7.41	9.34	1.99	2.45	2.83	3.34	3.73	4.14	5.21
PR_STL	2.44	0.63	26.70	3.44	4.22	4.89	5.77	6.44	7.15	9.04	5.29	6.49	7.51	8.88	9.91	11.00	13.90

Table 2: Proposed Drainage Area Calculations

HEC-HMS 4.12 software was used to calibrate hydrographs for use in the EPA-SWMM models described below. Atlas-14 rainfall values were utilized to calibrate the HEC-HMS model, matching peak-flow values found through rational method calculations. The loss method used in HEC-HMS is the Green-Ampt method, which utilizes coefficients found in the HCFCD M3 HEC-HMS model for the Spring Creek watershed.

7. POND ROUTING

Routing for the 0.73 AC-FT detention pond found in **Alternatives A-D** was accomplished through use of EPA-SWMM software. A stage-storage relationship was developed in Civil 3D software for use in EPA-SWMM, along with the inserted calibrated hydrographs. To drain the pond, a 30-inch outfall is used in each alternative. Each outfall will vary in slope as shown on **Exhibits 04-06**. The proposed pond has a high bank at elevation 166-ft and a toe at elevation 156-feet, resulting in 10 total feet of depth. The pond would have about 0.17 Acres of surface area.

8. ANALYSIS RESULTS

The resulting analysis from the methodologies described above yield the following results. The proposed 0.73 AC-FT pond detains the flow from proposed inlets and pipes and slows down the resulting flow to Spring Creek as described in **Table 3** below:

STORM EVENT	TOTAL EXISTING FLOW TO SPRING CREEK (CFS)	TOTAL PROPOSED FLOW TO SPRING CREEK, INCLUDING MAX OUTFLOW FROM POND FROM ALTERNATIVES (CFS)	Δ
10-yr	67.70	60.18	-7.52
25-yr	80.19	65.32	-14.87

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Houston, Texas 77079

Table 3: Comparison of Existing and Proposed flows

The pond provides a 10-year level of service with about a foot of freeboard. The pond nearly holds the 25-year flow, with some water overflowing from the pond at the peak. Topographical survey will be required to fully design this pond. Either space for a larger pond or a larger outfall is expected to be required to provide a higher level of service. This is shown in **Figures 5-6** below:

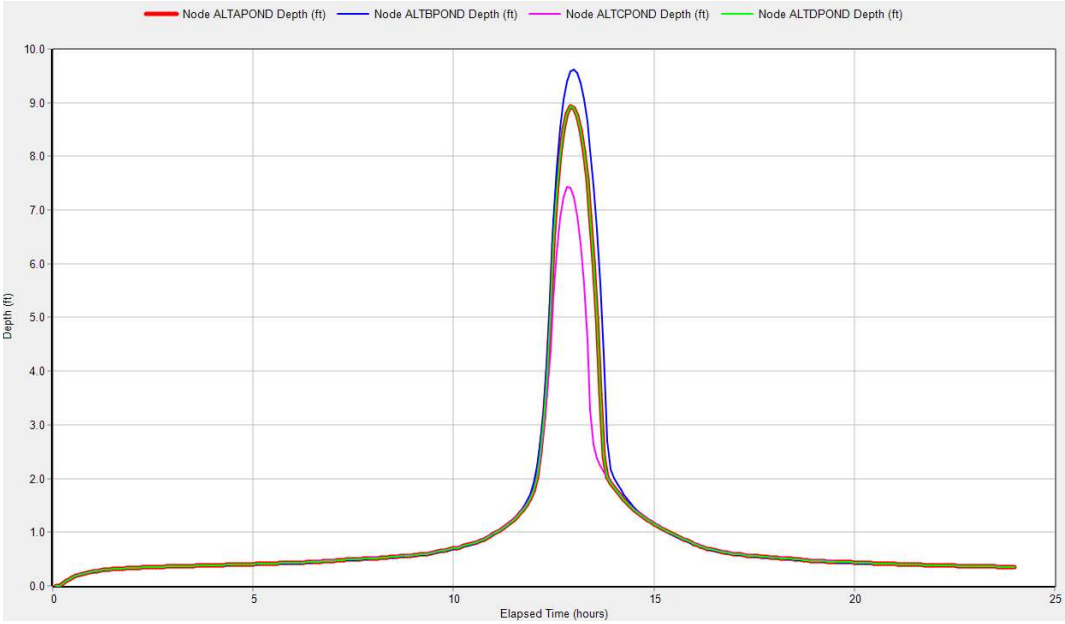

Figure 5. 10-Year Pond Depth Comparison

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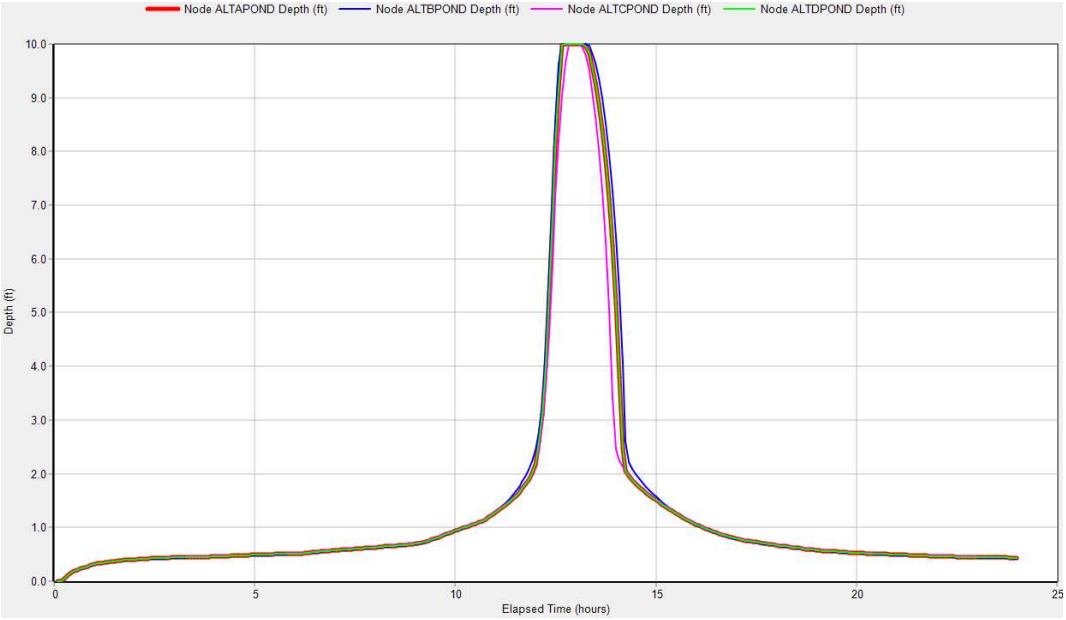

Figure 6. 25-Year Pond Depth Comparison

9. RECOMMENDATION & CONCLUSION

The analysis concludes that the drainage challenges at the intersection of Alice Lane and Camille Drive are mitigable. This feasibility study has identified several viable alternatives; among them, **Alternative A** is recommended as the preferred solution. Alternative A offers significant advantages, including increased freeboard within the proposed detention pond and the use of shallower piping along the outfall alignment, which contributes to improved constructability and reduced excavation requirements.

To confirm the effectiveness and feasibility of Alternative A, further work will be necessary. This includes detailed topographic surveying, geotechnical investigations, and comprehensive engineering design. While the preliminary findings support Alternative A as the most effective solution, it is essential to address certain unresolved issues—specifically, conflicting information in the recorded plat and the absence of an identified easement, as previously noted. These items will need to be researched/resolved in the next phase of the project.

In support of implementing Alternative A, it is also recommended that the City initiate the property acquisition process for the parcel located at the terminus of Camille Drive (HCAD

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Parcel No. 1129570000043, Block 4, Lot 43 of the Tomball Hills Addition). Please note that the cost of property acquisition is **not** included in the preliminary cost estimates provided in Appendix A.

Please see **Exhibits 04-08** and **Appendix A** for a comparison of cost estimation between proposed alternatives.

10. EXHIBITS AND APPENDICES

Exhibit 01……..	Existing Drainage Area Map
Exhibit 02……..	Proposed Drainage Area Map
Exhibit 03……..	Existing Drainage Pipes
Exhibit 04……..	Alternative A
Exhibit 05……..	Alternative B
Exhibit 06……..	Alternative C
Exhibit 07……..	Alternative D
Exhibit 08……..	Alternative E-Master Drainage Plan Design
Appendix A……	Alternative Cost Estimates
Appendix B……	Field Investigation Report

EXHIBIT 01

EXISTING DRAINAGE AREA MAP

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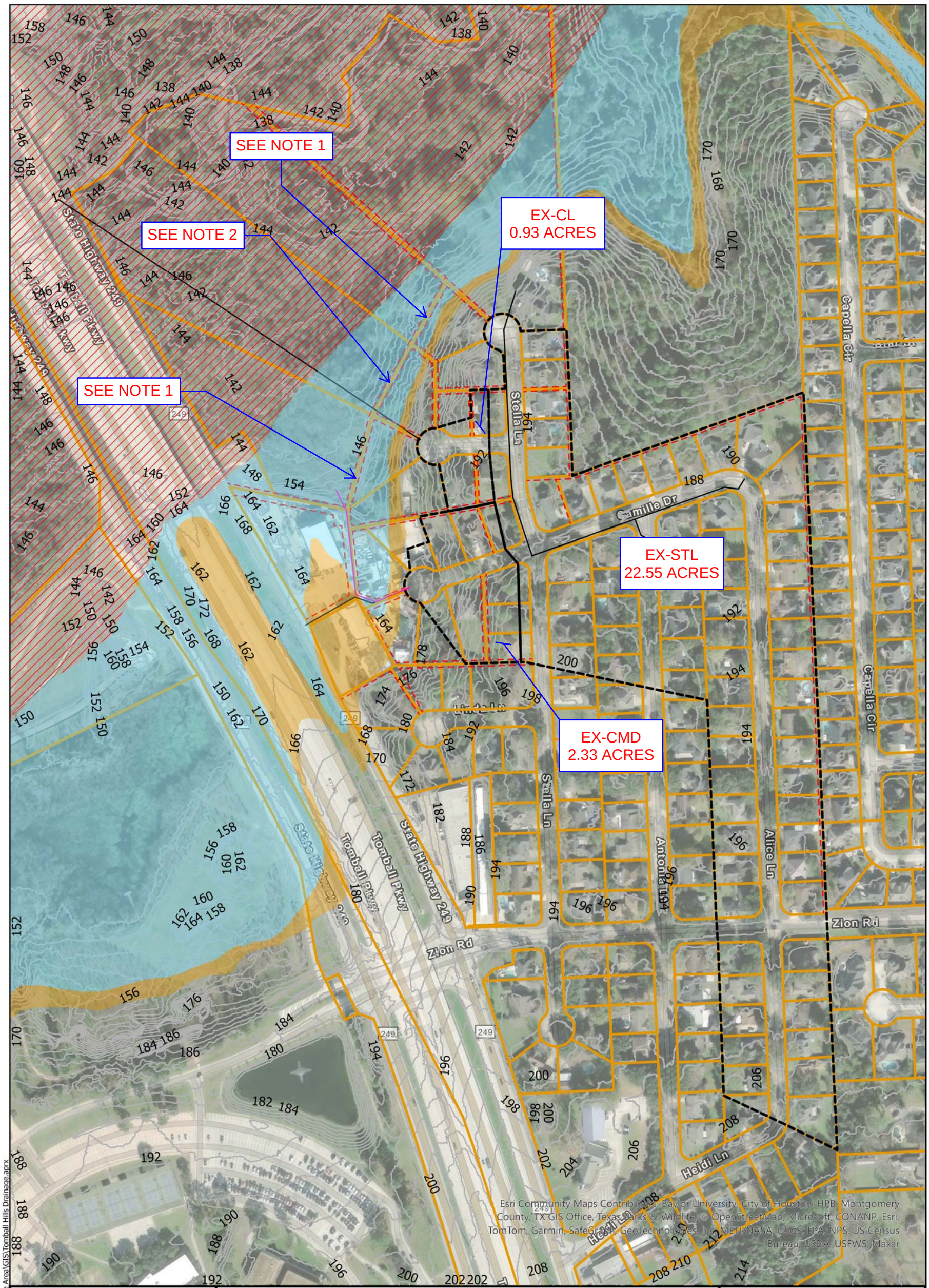

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TOMBALL HILLS DRAINAGE

EXISTING DRAINAGE AREA MAP

NOTES:
1) HCAD PARCEL SHAPEFILE DID NOT INCLUDE THIS PARCEL LINE, ADDED PER 1978 PLAT.
2) HCAD PARCEL SHAPEFILE EDITED TO REFLECT 1978 PLAT.

JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 01

LEGEND:
- EXIST DRAINAGE AREAS
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL

FEMA FLOOD ZONES:
- AE
- FLOODWAY
- X-SHADED

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EXHIBIT 02

PROPOSED DRAINAGE AREA MAP

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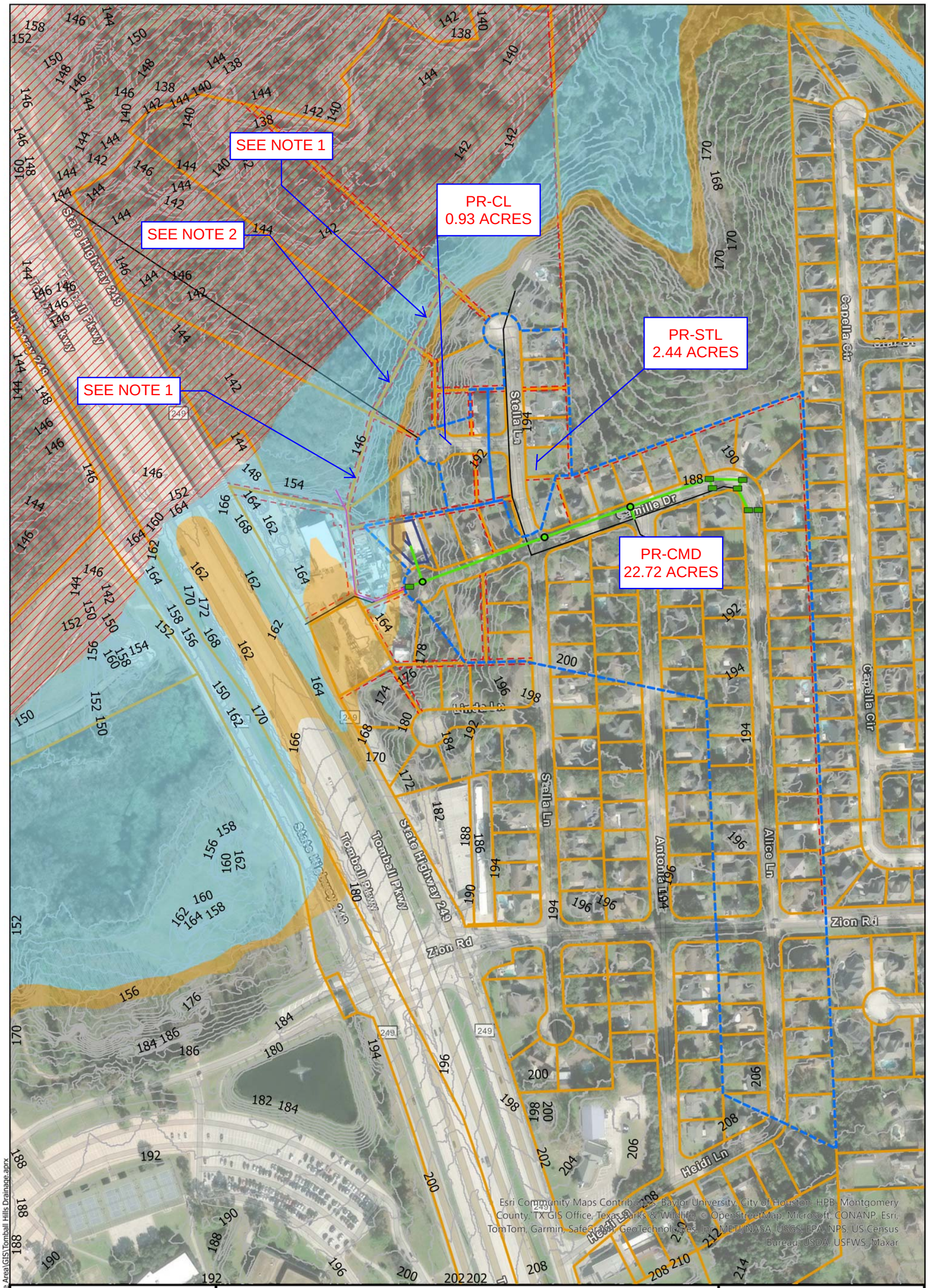

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TOMBALL HILLS DRAINAGE

PROPOSED DRAINAGE AREA MAP (ALT A-D)

NOTES:
1) HCAD PARCEL SHAPEFILE DID NOT INCLUDE THIS PARCEL LINE, ADDED PER 1978 PLAT.
2) HCAD PARCEL SHAPEFILE EDITED TO REFLECT 1978 PLAT.

JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 02

LEGEND:
- PROP DRAINAGE AREAS
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL
- PROPOSED POND (0.73 AC-FT, 10-FT DEEP)
- PROPOSED INLETS
- PROPOSED PIPES
- PROPOSED MANHOLES

FEMA FLOOD ZONES:
- AE
- FLOODWAY
- X-SHADED

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EXHIBIT 03

EXISTING DRAINAGE PIPES

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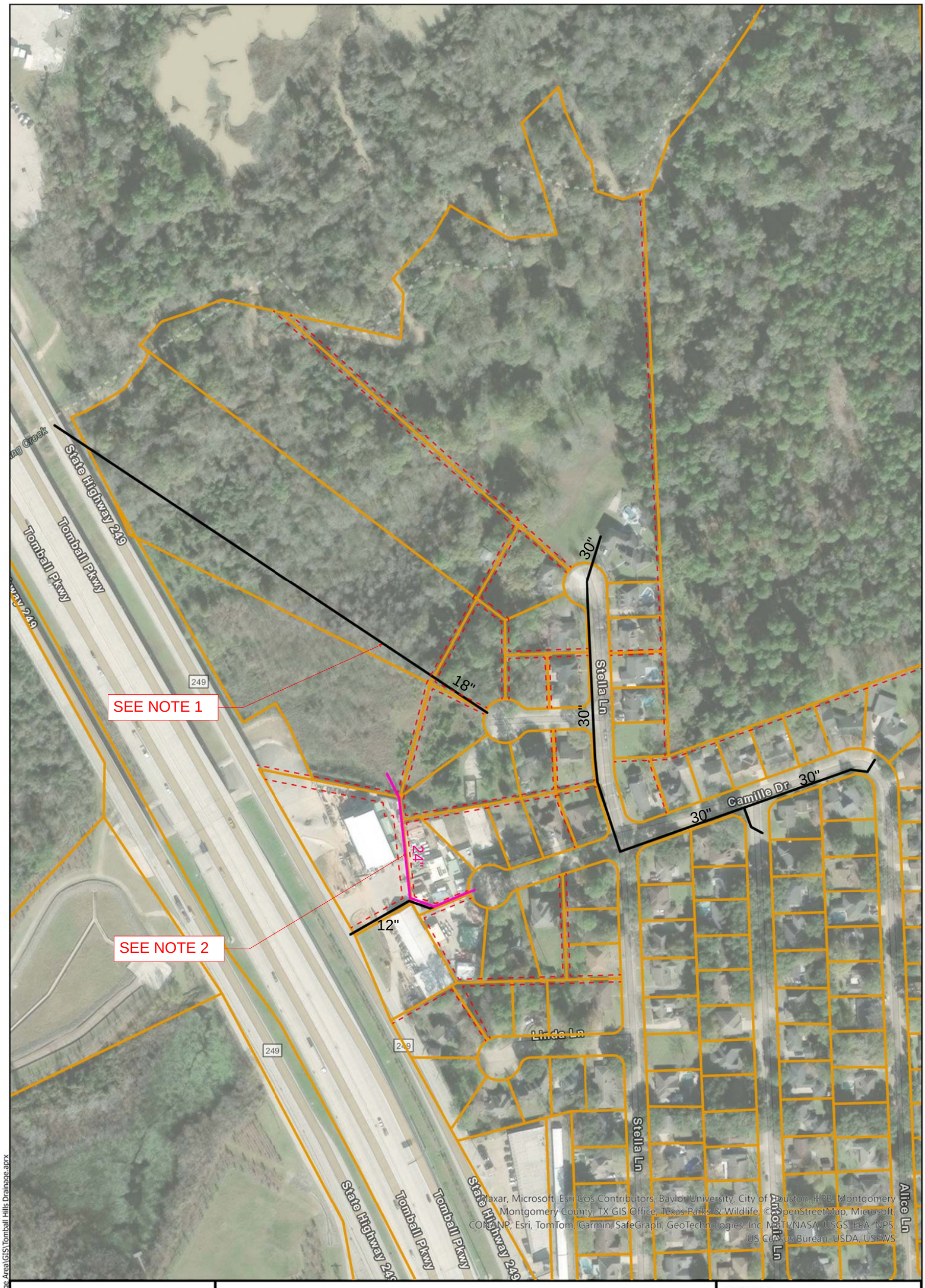

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TOMBALL HILLS DRAINAGE

EXISTING DRAINAGE PIPES

NOTES:
1) EXISTING PIPES SHOWN PER COT GIS SYSTEM. WE BELIEVE THIS PIPE MAY NOT EXTEND TO SPRING CREEK AND MUST BE LOCATED.
2) 24" OUTFALL PIPE DRAWN IN APPROXIMATE LOCATION PER "PROPOSED 24" STORM SEWER FROM CAMILLE DR. TO OUTFALL" PLAN SET

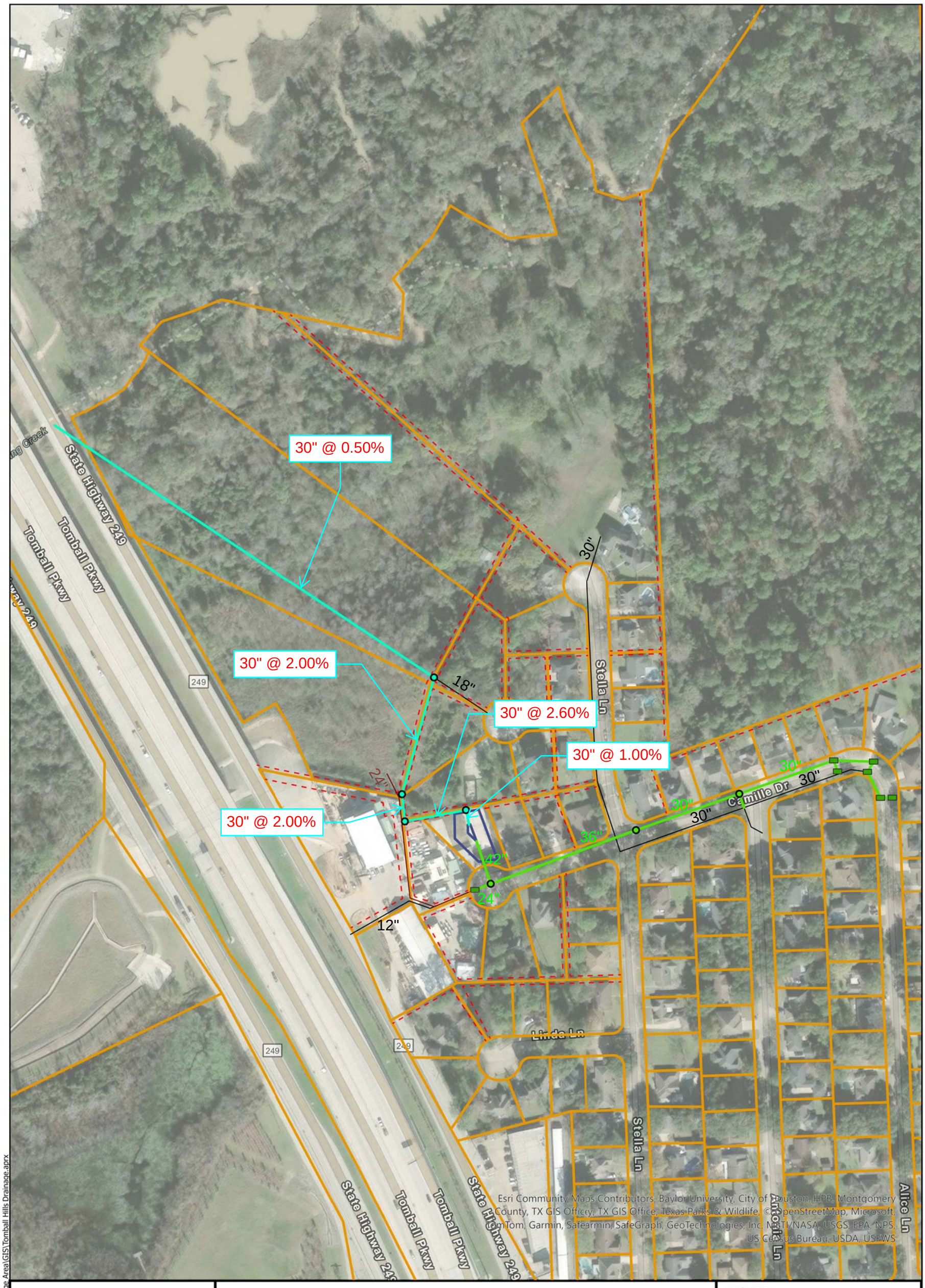
JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 03

LEGEND:
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL

EXHIBIT 04

ALTERNATIVE A

ARDURRA



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TOMBALL HILLS DRAINAGE

ALTERNATIVE A

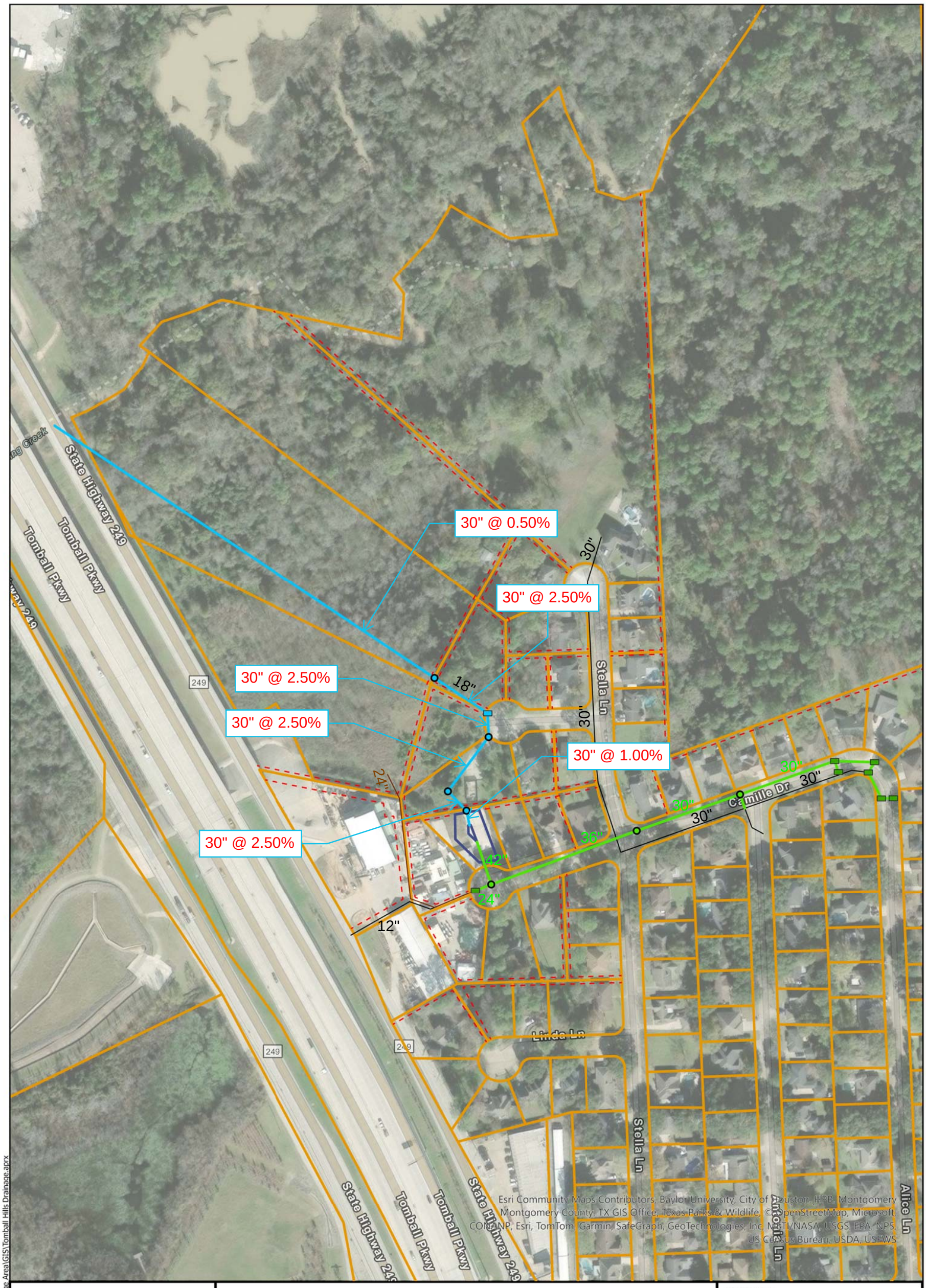
JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 04

LEGEND:
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL
- PROPOSED POND (0.73 AC-FT, 10-FT DEEP)
- PROPOSED MH-ALT A OUTFALL SYSTEM
- PROPOSED PIPE-ALT A OUTFALL SYSTEM
- PROPOSED INLETS
- PROPOSED MANHOLES
- PROPOSED PIPES

EXHIBIT 05

ALTERNATIVE B

ARDURRA



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TOMBALL HILLS DRAINAGE

ALTERNATIVE B

JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 05

LEGEND:
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL
- PROPOSED POND (0.73 AC-FT, 10-FT DEEP)
- PROPOSED INLET-ALT B OUTFALL SYSTEM
- PROPOSED MH-ALT B OUTFALL SYSTEM
- PROPOSED PIPE-ALT B OUTFALL SYSTEM
- PROPOSED INLETS
- PROPOSED MH
- PROPOSED PIPES

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EXHIBIT 06

ALTERNATIVE C

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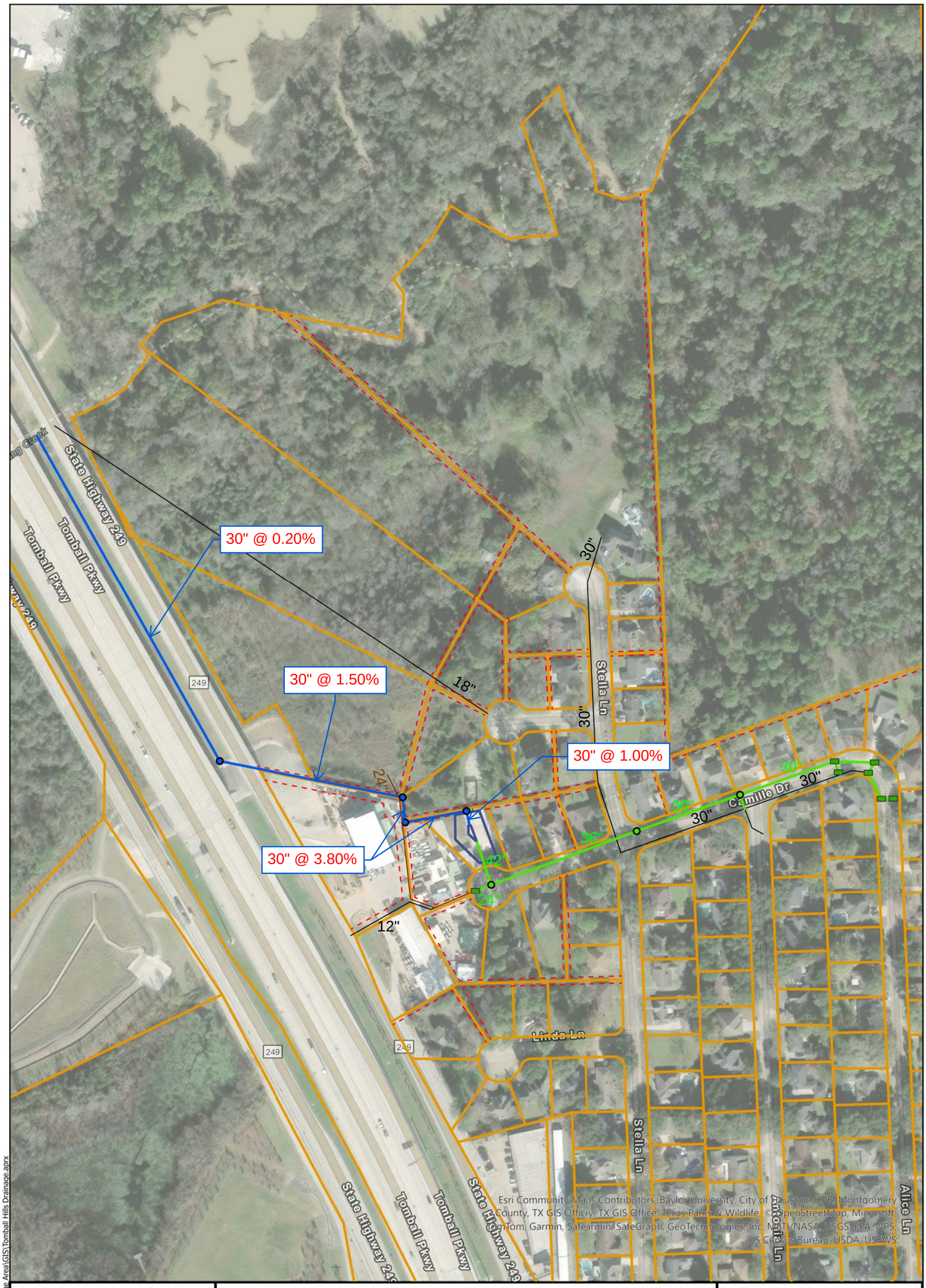

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TOMBALL HILLS DRAINAGE

ALTERNATIVE C

JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 06

LEGEND:
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL
- PROPOSED POND (0.73 AC-FT, 10-FT DEEP)
- PROPOSED MH-ALT C OUTFALL SYSTEM
- PROPOSED PIPE-ALT C OUTFALL SYSTEM
- PROPOSED INLETS
- PROPOSED MANHOLES
- PROPOSED PIPES

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EXHIBIT 07

ALTERNATIVE D

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TOMBALL HILLS DRAINAGE

ALTERNATIVE D

JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 07

LEGEND:
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL
- PROPOSED POND (0.73 AC-FT, 10-FT DEEP)
- PROPOSED MH-ALT D OUTFALL SYSTEM
- PROPOSED PIPE-ALT D OUTFALL SYSTEM
- PROPOSED INLETS
- PROPOSED MANHOLES
- PROPOSED PIPES

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EXHIBIT 08

ALTERNATIVE E - MASTER DRAINAGE PLAN DESIGN

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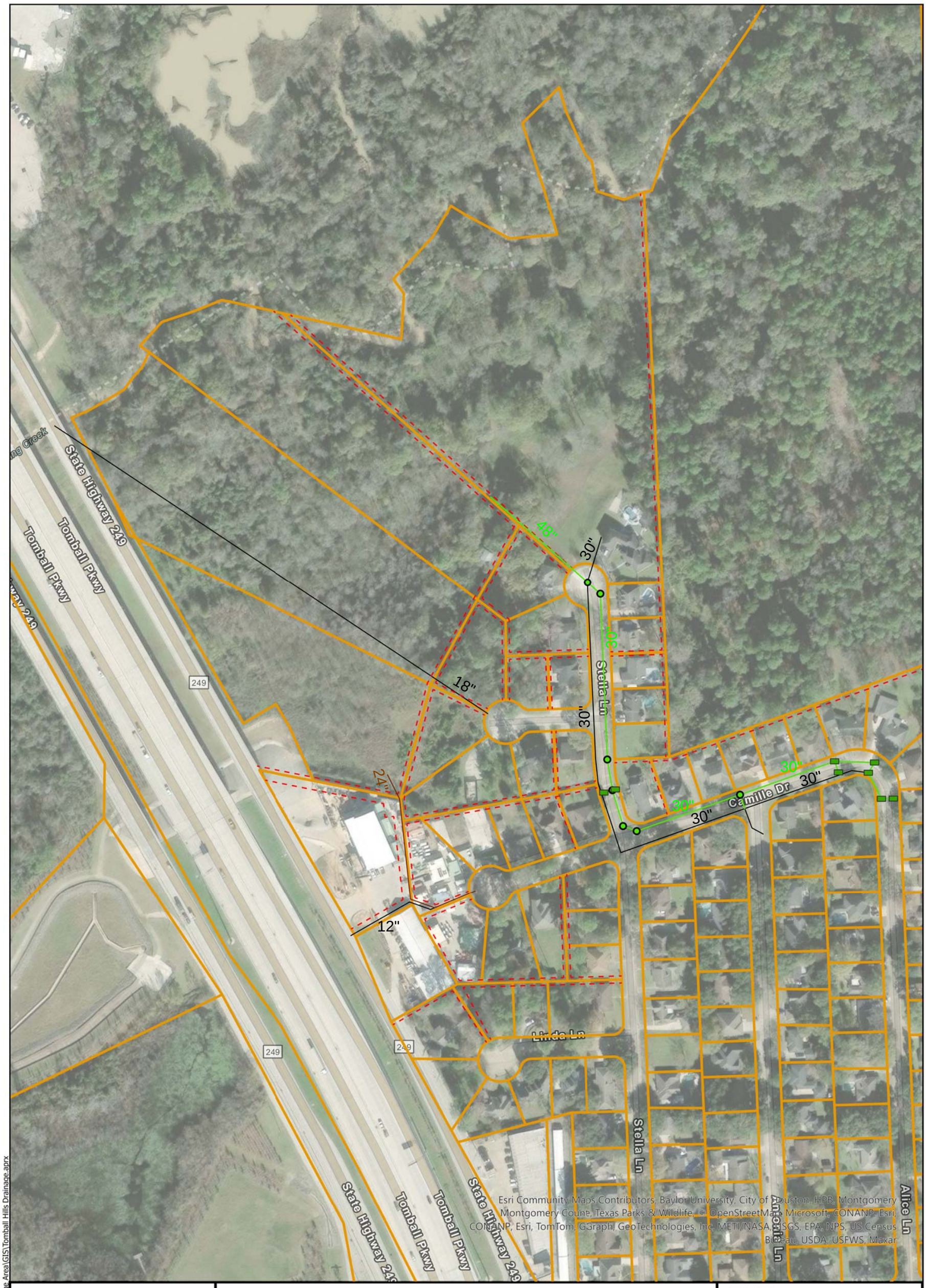

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TOMBALL HILLS DRAINAGE

ALTERNATIVE E - MASTER DRAINAGE PLAN DESIGN

JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 08

LEGEND:
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL
- PROPOSED INLETS
- PROPOSED MANHOLES
- PROPOSED PIPES

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APPENDIX A

COST ESTIMATE COMPARISON OF ALTERNATIVES

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TOMBALL HILLS DRAINAGE AREA FEASIBILITY STUDY															
				ALTERNATIVE A		ALTERNATIVE B		ALTERNATIVE C		ALTERNATIVE D		ALTERNATIVE E	
#	PAY ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL	QUANTITY	TOTAL	QUANTITY	TOTAL	QUANTITY	TOTAL	QUANTITY	TOTAL
1	REMOVE & DISPOSE OF ROADWAY PAVEMENT AND SUBGRADE	SY	$ 50.00	2156	$ 107,778.00	2156	$ 107,778.00	2156	$ 107,778.00	2156	$ 107,778.00	1540	$ 77,000.00
2	REMOVE & DISPOSE OF BUILDINGS AND STRUCTURES	LS	$ 50,000.00	1	$ 50,000.00	1	$ 50,000.00	1	$ 50,000.00	1	$ 50,000.00	1	$ 50,000.00
3	CLEARING & GRUBBING	AC	$ 15,000.00	1.00	$ 15,000.00	1.00	$ 15,000.00		$ -	1.00	$ 15,000.00	1.00	$ 15,000.00
4	EXCAVATION (POND)	CY	$ 18.00	1530	$ 27,540.00	1530	$ 27,540.00	1530	$ 27,540.00	1530	$ 27,540.00	0	$ -
5	FILL (POND)	CY	$ 30.00	459	$ 13,770.00	459	$ 13,770.00	459	$ 13,770.00	459	$ 13,770.00	0	$ -
6	REPLACE EXISTING REINFORCED CONCRETE PAVEMENT AND SUBGRADE	CY	$ 175.00	1248	$ 218,459.00	1248	$ 218,459.00	1248	$ 218,459.00	1248	$ 218,459.00	1540	$ 269,500.00
7	TRENCH SAFETY SYSTEM	LF	$ 3.00	2803	$ 8,408.00	2738	$ 8,213.00	2758	$ 8,273.00	2805	$ 8,414.00	1387	$ 4,161.00
8	REINFORCED SILT FENCE	LF	$ 4.00	6175	$ 24,702.00	6045	$ 24,182.00	6085	$ 24,342.00	6179	$ 24,718.00	3934	$ 15,736.00
9	STABILIZED CONSTRUCTION ACCESS	SY	$ 65.00	222	$ 14,445.00	222	$ 14,445.00	222	$ 14,445.00	222	$ 14,445.00	222	$ 14,445.00
10	24-INCH RCP STORM SEWER	LF	$ 120.00	99	$ 11,854.00	99	$ 11,854.00	99	$ 11,854.00	99	$ 11,854.00	89	$ 10,680.00
11	30-INCH RCP STORM SEWER	LF	$ 140.00	691	$ 96,740.00	691	$ 96,740.00	691	$ 96,740.00	691	$ 96,740.00	1298	$ 181,705.00
12	30-INCH CMP STORM SEWER OUTFALL	LF	$ 80.00	1556	$ 124,480.00	1491	$ 119,280.00	1511	$ 120,880.00	1558	$ 124,640.00	0	$ -
13	36-INCH RCP STORM SEWER	LF	$ 165.00	355	$ 58,524.00	355	$ 58,524.00	355	$ 58,524.00	355	$ 58,524.00	0	$ -
14	42-INCH RCP STORM SEWER	LF	$ 200.00	102	$ 20,434.00	102	$ 20,434.00	102	$ 20,434.00	102	$ 20,434.00	0	$ -
15	48-INCH CMP STORM SEWER OUTFALL	LF	$ 130.00	0	$ -	0	$ -	0	$ -	0	$ -	295	$ 38,350.00
16	STORM SEWER MANHOLE	EA	$ 5,000.00	7	$ 35,000.00	7	$ 35,000.00	7	$ 35,000.00	8	$ 40,000.00	7	$ 35,000.00
17	STORM SEWER INLET	EA	$ 3,000.00	7	$ 21,000.00	8	$ 24,000.00	7	$ 21,000.00	7	$ 21,000.00	8	$ 24,000.00
18	HCFCD TIMBER BENT FOR OUTFALLS	EA	$ 1,500.00	1	$ 1,500.00	1	$ 1,500.00	1	$ 1,500.00	1	$ 1,500.00	1	$ 1,500.00
			SUBTOTAL		**$ 849,634.00**		**$ 846,719.00**		**$ 830,539.00**		**$ 854,816.00**		**$ 737,077.00**
			UTILITY RELOCATION (5%)		$ 42,482.00		$ 42,336.00		$ 41,527.00		$ 42,741.00		$ 36,854.00
			CONTINGENCY (20%)		$ 178,424.00		$ 177,811.00		$ 174,414.00		$ 179,512.00		$ 154,787.00
			GRAND TOTAL		**$ 1,070,540.00**		**$ 1,066,866.00**		**$ 1,046,480.00**		**$ 1,077,069.00**		**$ 928,718.00**

APPENDIX B

FIELD INVESTIGATION REPORT

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Houston, Texas 77079

FIELD INVESTIGATION REPORT

TITLE	**FIELD INVESTIGATION REPORT - TOMBALL HILLS DRAINAGE AREA FEASIBILITY STUDY**		
PROJECT NO.	2025-0613-00	PREPARED BY:	DANIEL KEHRER, P.E.
DATE	MAY 15, 2025	APPROVED BY:	PATRICK DONART, P.E.

1. PROJECT BACKGROUND, LOCATION AND DESCRIPTION

The City of Tomball (the City) has contracted Ardurra Group, Inc. (Ardurra) to provide a feasibility study of drainage conditions in the Tomball Hills neighborhood. The neighborhood is in the northwest region of Tomball, Texas. The study area is in the northwest end of the neighborhood, specifically at the intersection of Camille Drive and Alice Lane, as well as along Camille Drive, Stella Lane and Chris Lane. The study area is bordered by wooded areas to the north, State Highway 249 to the west, and the rest of the neighborhood on other sides. The neighborhood has a fair amount of elevation change throughout and experiences flooding in localized areas during storm events.

2. PURPOSE AND SCOPE OF WORK

The goal of the study is to explore alternatives to reduce street flooding at the intersection of Camille Drive near Alice Lane and assess the effects on businesses along the SH 249 access road, while also limiting disruptions on Camille Drive and Stella Lane. The costs of any viable alternative solutions will be evaluated and compared to the current plan outlined in the Draft City of Tomball Drainage Master Plan (2025), along with consideration of non-cost factors such as public disruption, easements, and right-of-way impacts, to help the City decide on the best course of action.

3. FIELD INVESTIGATIONS AND FINDINGS

A site visit was performed on April 17th 2025 by Daniel Kehrer, P.E. and Ross Ozuna, P.E. from 4:00 – 5:00 PM. A previous visit was performed by Jeff Peters, P.E. and Patrick Donart, P.E. on January 27th, 2025, with some photos from this visit shared in this report. To analyze the existing conditions of the neighborhood, several specific locations were visited. These included the following:

A) The curve transition of Camille Drive and Alice Lane where drainage issues have been identified
B) Camille Drive-A cul-de-sac
C) Chris Lane-A cul-de-sac
D) Spring Creek-The ultimate drainage outfall

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Location A:

At this curve transition of Camille Drive and Alice Lane, drainage issues have been reported by the City and requested to be relieved by this project. The field visit was conducted on a dry day and flooding issues were not apparent, though some ponding can be seen in Google Earth imagery. There are two large inlets on either side of the road at the curve transition from Alice Lane to Camille Drive. These two inlets connect to a 30-inch RCP storm sewer pipe that continues north on Stella Lane. These two inlets appear warped and damaged. Please see **Photos 1 to 6** below.

Location B:

At this west end of Camille Drive at the cul-de-sac, drainage mitigation alternatives may be used as described in the following Drainage Area study report. Overland flows from the intersection of Stella Lane and Camille Drive drains to a single inlet at the west end of the cul-de-sac. The outfall from this inlet as shown in the Tomball GIS system and the Tomball Hills Subdivision Paving Plans could not be located in the field. This cul-de-sac is crowded with parked cars. Flooding issues were not apparent here. Please see **Photos 7 to 14** below.

Location C:

At this west end of Chris Lane at the cul-de-sac, drainage mitigation alternatives may be used as described in the following Drainage Area study report. Overland flows from the intersection of Stella Lane and Chris Lane drains to a single inlet at the west end of the cul-de-sac. The outfall from this inlet as shown in the Tomball GIS system and the Chris Lane Rehab plan set could not be located in the field. Per City of Tomball GIS, this outfall is believed to be at Spring Creek underneath the SH 249 north bound frontage road bridge, see Location D below. Please see **Photos 15 to 21** below.

Location D:

As mentioned above, the outfall from the Chris Lane inlet is shown in GIS system and as-built plans as present at Spring Creek underneath the SH 249 north bound frontage road bridge. However, the outfall could not be found in the field at the creek. We believe this outfall is either buried or present at the location shown in the original plans, the Tomball Hills Subdivision Paving plans. This plan set shows the outfall present along the property line perpendicular to the Chris Lane inlet, ultimately draining to Spring Creek over time across HCAD property numbers 1129570000036 and 1129570000080. However, the outfall was not found in this location. Please see **Photos 22 to 25** below.

See **Exhibit 01** for a schematic of Existing Drainage Pipes.

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4. FIELD PHOTOS

Photo Location Map

Photo 1

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Photo 2

Photo 3

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Photo 4

Photo 5

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Photo 6

Photo 7

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Photo 8

Photo 9

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Photo 10

Photo 11

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Photo 12

Photo 13

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Photo 14

Photo 15

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Photo 16

Photo 17

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Photo 18

Photo 19

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Photo 20

Photo 21

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Photo 22

Photo 23

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Photo 24

Photo 25

EXHIBIT 01

EXISTING DRAINAGE PIPES

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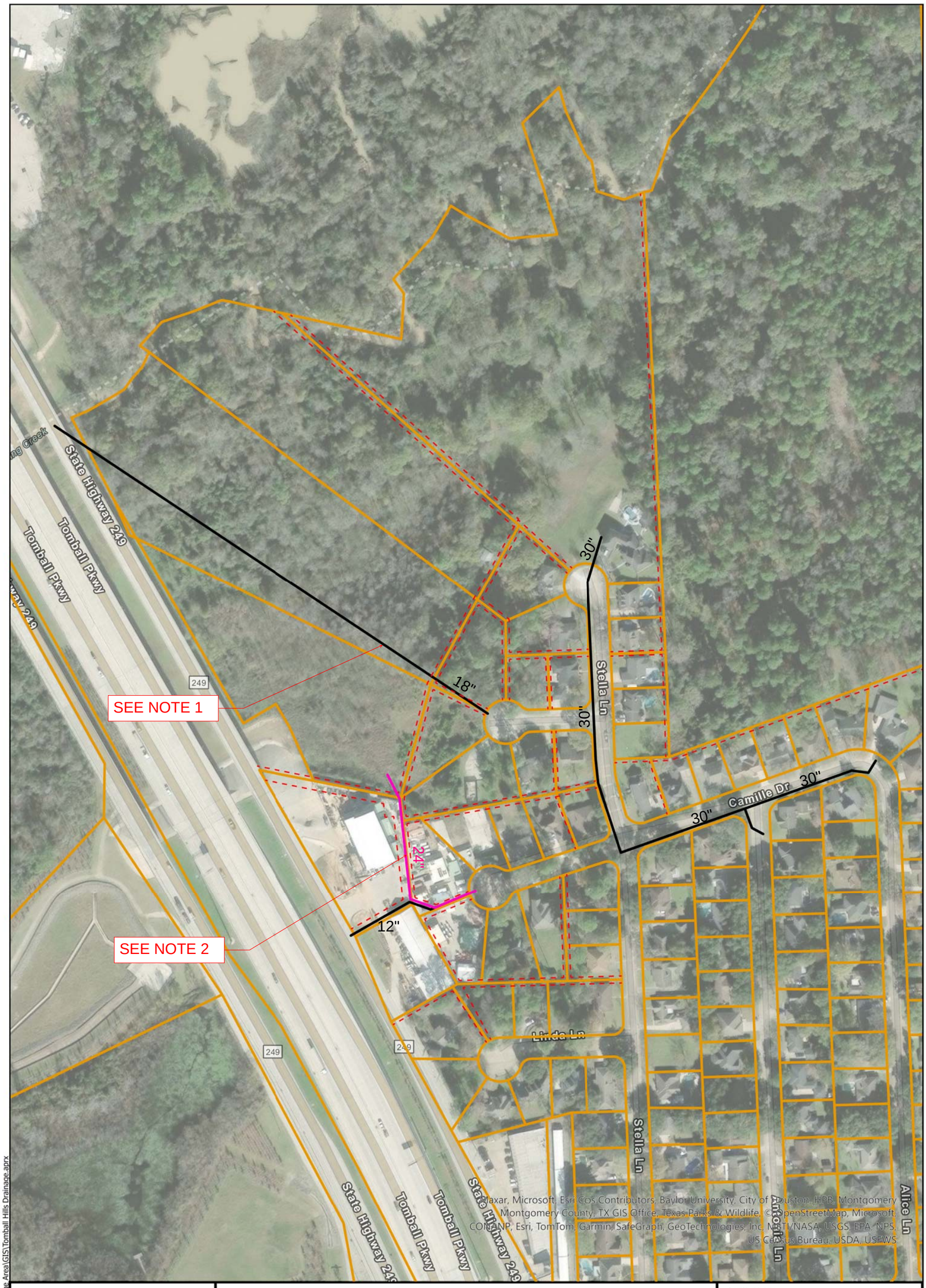

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TOMBALL HILLS DRAINAGE

EXISTING DRAINAGE PIPES

LEGEND:
- HCAD PARCELS
- LOCAL RELEVANT EASEMENTS
- EXISTING STORM
- EXISTING 24" OUTFALL AT HILLTOP TOOL

NOTES:
1) EXISTING PIPES SHOWN PER COT GIS SYSTEM. WE BELIEVE THIS PIPE MAY NOT EXTEND TO SPRING CREEK AND MUST BE LOCATED.
2) 24" OUTFALL PIPE DRAWN IN APPROXIMATE LOCATION PER "PROPOSED 24" STORM SEWER FROM CAMILLE DR. TO OUTFALL" PLAN SET

JOB NO: 2025-0613-00	DATE: 5/13/2025	EXHIBIT NO. 01