Bridgeland Development Company

Bridgeland West
Harris County, Texas

4,594 acres

Alternatives Analysis

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March 2022

Table of Contents

Acronyms and Abbreviations ..... **iv**

Section 1 Introduction **1**

1.1 Introduction 1

1.2 Purpose and Need 1

Section 2 Alternatives Analysis **3**

2.1 Screening Criteria Evaluation 3

2.2 No Action Alternative 5

2.3 Evaluation of Practicable Alternatives 5

2.3.1 Preferred Alternative – Bridgeland West 6

2.3.2 Offsite Alternative 1 – Hegar Tract 6

2.3.3 Offsite Alternative 2 – Woodard Tract 6

2.3.4 Onsite Alternative 1 6

2.3.5 Onsite Alternative 2 6

2.4 Evaluation of Onsite Alternatives 6

2.4.1 Preferred Alternative 7

2.4.2 Onsite Alternative 1 7

2.4.3 Onsite Alternative 2 7

Section 3 Avoidance, Minimization, and Mitigation **8**

3.1 Avoidance and Minimization 8

3.2 Mitigation 8

Section 4 Literature Cited **10**

List of Tables

Table 1. Screening Criteria for Evaluation of Alternatives 3

Table 2. Summary Table for Site Screening Selection Criteria 4

Table 3. Evaluation of Practicable Alternatives 5

Table 4. Summary of Aquatic Resources for Onsite Alternatives 7

List of Appendices

Appendix A: Exhibits

List of Exhibits

Exhibit 1: Site Vicinity Map
Exhibit 2: Site Vicinity Aerial Map
Exhibit 3: Preferred Alternative Map
Exhibit 4: Offsite Alternative 1 Map- Hegar Tract
Exhibit 5: Offsite Alternative 2 Map- Woodard Tract
Exhibit 6: Offsite Alternative 3 Map- Rice University Tract

Exhibit 7: Onsite Alternative 1 Map
Exhibit 8: Onsite Alternative 2 Map

Acronyms and Abbreviations

404(b)(1) guidelines	*Guidelines for Preparation of Analysis of Section 404 Permit Applications Pursuant to the Section 404(b)(1) Guidelines of the Clean Water Act* (40 Code of Federal Regulations § 230)
Bridgeland	Applicant
CFR	Code of Federal Regulations
FEMA	Federal Emergency Management Agency
FM 529	Farm to Market Road 529
IH-10	Interstate Highway10
MPC	Master planned community
NWI	National Wetland Inventory
PRM	permittee-responsible mitigation
Project	Bridgeland West
SH 99	State Highway 99
US 290	U.S. Highway 290
USACE	U.S. Army Corps of Engineers
WOTUS	Waters of the US

Section 1
Introduction

1.1 Introduction

An integral part of the U.S. Army Corps of Engineers (USACE) section 404 permitting process is the analysis of project alternatives. A key provision of the *Guidelines for Preparation of Analysis of Section 404 Permit Applications Pursuant to the Section 404(b)(1) Guidelines of the Clean Water Act* (40 Code of Federal Regulations [CFR] § 230), hereinafter referred to as the 404(b) (1) guidelines is the "practicable alternative test." The practicable alternative test requires that "no discharge of fill material shall be permitted if there is a practicable alternative to the proposed fill which would have a less adverse impact on the aquatic ecosystem." When the proposed project is not water dependent, the applicant must clearly demonstrate that there are no alternatives available that would avoid impacts to aquatic resources.

For an alternative to be considered "practicable," the land must be available, and the project must be feasible after taking into consideration cost, existing technology, and logistics considering the overall project purpose. Practicability criteria for this alternative evaluation are listed and discussed in Section 2.1.

The Howard Hughes Corporation (Applicant) proposes to develop the 4,594-acre Bridgeland West project as part of the larger 11,400-acre master planned community (MPC) of Bridgeland which broke ground in 2004. **Exhibits 1 and 2**.

The proposed development will impact 155.27 acres of Waters of the U.S. (WOTUS). The alternative analysis discussed below reviews the applicant's no action alternative, preferred alternative, two onsite alternatives and three offsite alternatives.

1.2 Purpose and Need

The primary purpose of the project is to further develop a mixed-use MPC located near major thoroughfares. Bankrate.com defines a MPC as "*a large-scale residential neighborhood with a large number of recreational and commercial amenities, such as golf courses, tennis courts, lakes, parks, playgrounds, swimming pools, and even stores and restaurants. Some master-planned communities may have schools, office parks, large shopping centers and other businesses*."

MPC's are typically larger than 2,500 acres and provide a self-contained experience for their residents. MPCs are different from subdivisions in that they foster a sense of community and provide lifestyle amenities. In many cases, as with Bridgeland's early development, MPCs offer services such as schools and stores that would otherwise require longer drives for MPC residents. The Houston region is adding nearly 250 people a day (Houston Business Journal 2021) and the strain on housing has become evident in low available inventory and increased sales and rental prices.

As the Houston population continues to grow, so do development needs, much of which is happening on the west and northwest side of Houston. As developers try to meet the housing needs, it has become a race to market to complete projects and provide the types of housing products and communities that homeowners desire.

The Houston Metropolitan area's economic vitality continues to be strong. The Greater Houston Partnership reports the finance and insurance sectors, record homes sales, and the surge in mortgage refinancing help to drive job growth in the region (Greater Houston Partnership 2021). This is added to the sectors that have driven the Houston economy in the past, such as life sciences and biotechnology, oil and gas, and aviation. The Houston housing market has seen record gains in housing demand since 2018. Between 2018 and 2019 the number of households added to the area outpaced the growth of new housing units (Sherman *et al* 2021).

Since Houston does not utilize zoning, owning a house in a non-MPC comes with uncertainty about what could be built nearby, potentially devaluing the neighborhood and the homes within. Neighborhoods have seen unsightly and potentially unhealthy construction, such as refineries, landfills, and similar industrial sites, pop up nearby long after the homes were built. An MPC allows the residents to live in a place with a future plan that will contain desirable amenities without worrying about an industrial site next door. MPCs can be more mindful of environmental impacts since they can make a plan that has a more regional effect by connecting stream corridors, trails, greens spaces, and parks. Compensatory mitigation resulting from MPC development is generally larger in size and able to generate significant habitat improvements rather than patches of habitat interspersed amongst the developing landscape.

Living within the city has proven to be more expensive, crowded and less safe. Home prices are rising faster than incomes, forcing people out of the hub areas (Dickler 2021). Moving out of the city gives residents options for housing prices, larger spaces and safer areas to move about and interact with the natural and built communities. As more people move out of the city, coupled with the supply chain deficiencies as a result of the pandemic, lot deliveries have fallen behind with higher-than-average demand, creating a housing shortage. To counteract this housing shortage and provide a desirable place to live, the applicant proposes to expand the existing Bridgeland MPC with the Bridgeland West project.

Section 2
Alternatives Analysis

Four properties, including Bridgeland, located northwest/west of Houston were considered in this analysis. The Applicant evaluated these project alternatives to determine whether any other sites or layouts may have substantial advantages compared to the proposed project. In Sections 2.1-2.4, the Applicant evaluates the no action alternative, preferred alternative, and onsite and offsite alternatives, which inform the reasonable and practicable avoidance, minimization, and mitigation measures discussed in Section 3.

The Applicant started the evaluation with seven alternatives and went through a series of tiered screening criteria to determine the viability of each of these alternatives. Information was gathered from resources such as publicly available GIS data, Google Earth Pro, and databases to inform the outcome of the criteria.

2.1 Screening Criteria Evaluation

The 404(b)(1) guidelines consider an alternative to be practicable "if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." The screening criteria used to assess the practicability of identified alternatives and the screening criteria definitions are outlined in **Table 1** below. The screening criteria include the size of the sites, the ability to meet the purpose and need of the project, and the proximity to major highways. Each of the identified alternatives were evaluated using the screening criteria and a summary of the results are provided in **Table 2**. The alternative sites considered are shown on **Exhibits 3-8**.

Table 1. Screening Criteria for Evaluation of Alternatives

Criterion	Definition	Basis for Criterion
Project Size	Meets the size required for the Project. Alternative sites should be between 3,500 and 6,000 acres in size.	Alternative sites must be large enough to accommodate the mixed-use development, but not more than design requirements.
Purpose and Need	Meets purpose and need of the proposed project.	Implementation of the alternatives must meet the overall goals and purpose of the proposed project.
Proximity to Major Highways	Located no more than 5 miles from major highways/thoroughfares.	Alternatives sites must be within a maximum distance from the major thoroughfare to ease commuter access to and from the development.

Table 2. Summary Table for Site Screening Selection Criteria

Site Screening Selection Criteria	No Action	Preferred	Offsite 1 – Hegar	Offsite 2 – Woodard	Offsite 3 – Rice	Onsite 1	Onsite 2
Project Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Purpose and Need	No	Yes	Yes	Yes	Yes	Yes	Yes
Proximity to Major Highways	Yes	Yes	Yes	Yes	No	Yes	Yes
Practicable Site	**No**	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**

The Preferred Alternative (PA) is located west of and adjacent to SH 99 and west of the existing Bridgeland MPC (**Exhibit 3**). It is bordered to the north by the proposed expansion right-of-way for Jack Road and to the south generally by Langham Creek. Katy-Hockley Road is located along the western border. The PA is approximately 4,594 acres, which satisfies the size requirements for practicability. This alternative meets the selection criteria to be considered a practicable alternative and is carried forward for additional evaluation.

Offsite Alternative 1 (Offsite 1), Hegar Tract, is located 0.3 mile north of US 290 and bisected by Hegar Road (**Exhibit 4**). The western boundary is generally Kermier Road, Spring Creek to the north and Roberts Road to the east. The site is approximately 3,505 acres in northwest Harris County. This alternative meets the selection criteria to be considered a practicable alternative and is carried forward for additional evaluation.

Offsite Alternative 2 (Offsite 2), Woodard Tract, is located north of Magnolia in Montgomery Country and is bisected by US 249 (**Exhibit 5**). The site is approximately 5,370 acres. This alternative meets the selection criteria to be considered a practicable alternative and is carried forward for additional evaluation.

Offsite Alternative 3 (Offsite 3), Rice University Tract, is located west of Magnolia in Montgomery County and is bisected by FM 1488 (**Exhibit 6**). It is approximately 4,101 acres. Development of Offsite 3 would provide additional housing but is not near a major highway; therefore, it not considered a practicable alternative and is not carried forward for additional evaluation.

Onsite Alternative 1 (Onsite 1) is the same site as the PA. This alternative meets the selection criteria to be considered a practicable alternative and is carried forward for additional evaluation (**Exhibit 7**).

Onsite Alternative 2 (Onsite 2) is the same site as the PA and Onsite 1 with an additional 997 acres included (**Exhibit 8**), total 5,591 acres. This alternative meets the selection criteria to be considered a practicable alternative and is carried forward for additional evaluation.

The PA and Alternatives Offsite 1, Offsite 2, Onsite 1 and Onsite 2 meet all screening criteria and are considered practicable alternatives. These five alternatives are further evaluated in Sections

2.3 and 2.4. The No Action Alternative and Alternative Offsite 3 do not meet the practicability screening criteria and are, therefore, not considered further in this analysis.

2.2 No Action Alternative

The No-Action Alternative (NAA) would leave the land in its current state but would not satisfy the need of the project to help alleviate the housing shortage in the Houston region. This alternative would not have a positive economic impact in the area and the surrounding communities. Since the applicant already owns the land, not developing the project would have significant financial impact due to the cost basis of the land and unrealized opportunity for a return on this next phase of the Bridgeland development.

Much of the infrastructure and amenities built on the east side of SH 99 is meant to be extended and shared with Bridgeland West, including schools, parks, water/wastewater plants, utility corridors, roadways, hike/bike trail systems, and stormwater management and drainage. Without the construction of Bridgeland West, the cost of those features would fall on fewer residents, resulting in an unbalanced financial burden for existing Bridgeland patrons and Harris County.

Local and state agencies have long planned for the expansion of Houston to the west and northwest. Major thoroughfares such as IH 10, US 290 and SH 99 help to alleviate traffic congestion on local streets and facilitate commuting to regional business centers east-southeast of Bridgeland. The NAA would not take advantage of the infrastructure and resources already constructed in the area, specifically to address Houston's growth into northwest Harris County.

In summary, the NAA would not meet the purpose and need of the project to help with housing shortages and is not considered by Bridgeland to be a practicable alternative.

2.3 Evaluation of Practicable Alternatives

This section further assesses the alternatives determined to be practicable as identified in **Table 2**. Additional criteria, including availability of utilities, distance from downtown (20-30 miles), and potential impacts to listed species were evaluated to further determine the practicality of the alternatives for the Applicant. The results of this assessment are shown in **Table 3**.

Table 3. Evaluation of Practicable Alternatives

Parameter	Preferred-Bridgeland W	Offsite 1 – Hegar	Offsite 2 – Woodard	Onsite 1	Onsite 2
Size (acres)	4,594	3,505	5,370	4,594	5,591
Availability	Owned by applicant	Likely available	Likely available	Owned by applicant	Owned by applicant
Utilities	Adjacent at Bridgeland MPC	None	None	Adjacent at Bridgeland MPC	Adjacent at Bridgeland MPC
Distance to downtown (miles)	26	34	42	26	26

Parameter	Preferred-Bridgeland W	Offsite 1 – Hegar	Offsite 2 – Woodard	Onsite 1	Onsite 2
Potential for Presence of Protected Species	None	EOID for plains spotted skunk, southern crawfish frog, and Alfisol coastal prairie	None	None	None

Sources: FEMA 2021; TxNDD 2021

2.3.1 Preferred Alternative – Bridgeland West

This site is 26 miles from downtown, which is attractive to commuters. Since the PA is located adjacent to Bridgeland MPC, it will utilize the existing infrastructure, utilities and amenities that are afforded to the current residents. With the expansion of Bridgeland MPC, new businesses, schools, and roadways, will come online to service the growing community. The expansion will cut down on commuting, save residents' time and reduce fuel needs.

2.3.2 Offsite Alternative 1 – Hegar Tract

Offsite 1 is mostly surrounded by undeveloped land and homesteads that utilize wells and septic systems. There are no utilities at or adjacent to the property, which would be costly to run to the site. This site is approximately 5 miles from the Bridgeland development, so the use of existing utilities is not practical or cost effective. This site is 34 miles from downtown, which is longer than the preferred distance of less than 30 miles. This site is known to contain state species of concern and a sensitive vegetation community.

2.3.3 Offsite Alternative 2 – Woodard Tract

Offsite 2 is mostly surrounded by undeveloped land and homesteads that utilize wells and septic systems. There are no utilities at or adjacent to the property, which would be costly to run to the site. This site is approximately 20 miles from the Bridgeland development, so the use of existing utilities is not practical or cost effective. This site is more than 42 miles from downtown Houston, which is substantially longer than the preferred distance of less than 30 miles.

2.3.4 Onsite Alternative 1

This alternative has the same project area as the PA and meets the secondary screening criteria.

2.3.5 Onsite Alternative 2

This alternative is similar to the PA and Onsite 1 but the boundary is expanded by 997 acres. This alternative meets the secondary screening criteria and will be further evaluated.

2.4 Evaluation of Onsite Alternatives

The PA site is a mix of pasture, emergent wetlands, and the Cypress Creek stream corridor. A detailed description of natural features for much of the PA site is available in the Environmental Overview in **Attachment A**. Approved and Preliminary Jurisdictional Determinations have been verified for most of the site and can be found in **Attachment B**. **Table 4** compares aquatic resources for each of the onsite alternatives. Where verified information was available, it was utilized. In the areas that are not yet verified, the best available data, ground-truthed or aerially interpreted, was used. As part of the MPC, Bridgeland plans to preserve much of the Cypress Creek corridor which will allow for the enhancement of water quality, protection of the floodplain through mitigation and a wildlife corridor.

Table 4. Summary of Aquatic Resources for Remaining Alternatives

Parameter	Preferred Alternative (acres)	Onsite Alt 1 (acres)	Onsite Alt 2 (acres)
WOTUS	369.08	369.08	439.32
Impacts	155.27	322.76	218.79
Floodplain	2,135.64	2,135.64	3,005.90
Floodway	686.30	686.30	690.53

2.4.1 Preferred Alternative

The PA would mostly be graded and filled for the construction of Bridgeland West. Through excavation and fill, the gross earthmoving would result in 155.27 acres of permanent impacts to WOTUS (**Exhibit 3**) as depicted in the proposed land plan. The floodplain mitigation areas would be deepened to reduce their footprint, thereby reducing the overall impacts by 167.48 acres compared to Onsite 1 and 63.51 acres compared to Onsite 2. Based on the avoidance and minimization of WOTUS, the Applicant considers the PA to be the least environmentally damaging practicable alternative.

2.4.2 Onsite Alternative 1

Onsite 1 would result in full use of the entirety of the site, whereby the whole site would be graded and filled as necessary. This would result in the permanent loss of 322.76 acres of aquatic resources. Additionally, the floodplain mitigation areas would impact most of the resources in the floodway. Onsite 1 does not account for the avoidance or minimization of impacts on WOTUS or any other resource; Onsite 1 would not be the least environmentally damaging practicable alternative.

2.4.3 Onsite Alternative 2

Onsite 2 is the same base site as the PA with the addition of 997 acres just to the south of the PA site. Development of Onsite 2 would result in 218.79 acres of WOTUS impacts out of the 439.32 acres of WOTUS within the alternative. While Onsite 2 would avoid and minimize some impacts to WOTUS, the Applicant determined this additional area was not necessary for the proposed project and identified additional ways to avoid and minimize impacts through the PA. Therefore, Onsite 2 would not be considered the least environmentally damaging practicable alternative.

Section 3
Avoidance, Minimization, and Mitigation

3.1 Avoidance and Minimization

Based on the foregoing analysis, the PA will result in the least impacts on waters of the U.S. by avoiding and minimizing development in wetlands and streams to the extent practicable, while still meeting the purpose and need of the project. The PA results in the most optimal layout and best use of space within the project area and will avoid impacts to 217.26 acres of WOTUS comprised of:

- 152.68 acres of PEM wetlands,
- 19.78 acres of PSS wetlands,
- 41.63 acres of PFO wetlands, and
- 3.17 acres of PUBx.

The PA will minimize impacts to adjacent wetlands by reducing impacts as compared to Onsite 1 and Onsite 2. In addition, the PA will avoid impacts to all delineated streams within the project area. *As noted above, the PA avoids and minimizes impacts as much as possible and is the least environmentally damaging practicable alternative*.

3.2 Mitigation

While Bridgeland is proposing to avoid and minimize impacts to the extent practicable, the PA will result in unavoidable impacts to 155.27 acres of WOTUS. These impacts will be mitigated through permittee-responsible mitigation (PRM), for which RES has developed a detailed plan (**Attachment D** of the cover letter). The 195-acre PRM Site is located 4 miles from the proposed project site and is in the heart of the Katy Prairie and the Cypress Creek Watershed. The PRM objective is to provide compensatory mitigation for the permanent impacts to 155.27 acres of wetlands. The compensation will be based on replacement of functions and will result in the restoration of physical, biological, and chemical wetland functions, including the temporary storage and detention of surface water, maintenance of plant and animal communities, and the removal and sequestration of elements and compounds.

The PRM Plan calls for establishment of 29.50 acres of forested wetlands and 7.57 acres of scrub/shrub wetlands, and re-establishment of 95.79 acres of herbaceous wetland and prairie depressional wetland. The expected increase in wetland functional values to be provided through the implementation of the PRM Plan would meet or exceed the decrease in functional values expected to result from the proposed project.

The PRM is designed to restore longer hydroperiods to the PRM site such as are believed to have existed prior to anthropogenic manipulations by the degradation of ditches that currently drain the

Bridgeland West project, installation of low berms, and the addition of landscape depressions and microtopography/roughness to the landscape. The PRM Plan then calls for establishment and re-establishment of forested, scrub/shrub and emergent wetlands throughout the PRM site. Vegetation restoration will occur through direct planting and/or seeding, natural recruitment, and active invasive plant management. The tree species to be planted will consist of natives adapted to floodplain environments within the Western Gulf Coastal Plain. The target herbaceous plant community will be similar to the herbaceous vegetation found in nearby wetlands and wetland complexes.

The PRM Plan contains performance standards against which the PRM site will be monitored and evaluated on a yearly basis for 10 years or until all performance standards are achieved (whichever is later).

Section 4
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Appendix A

Exhibits

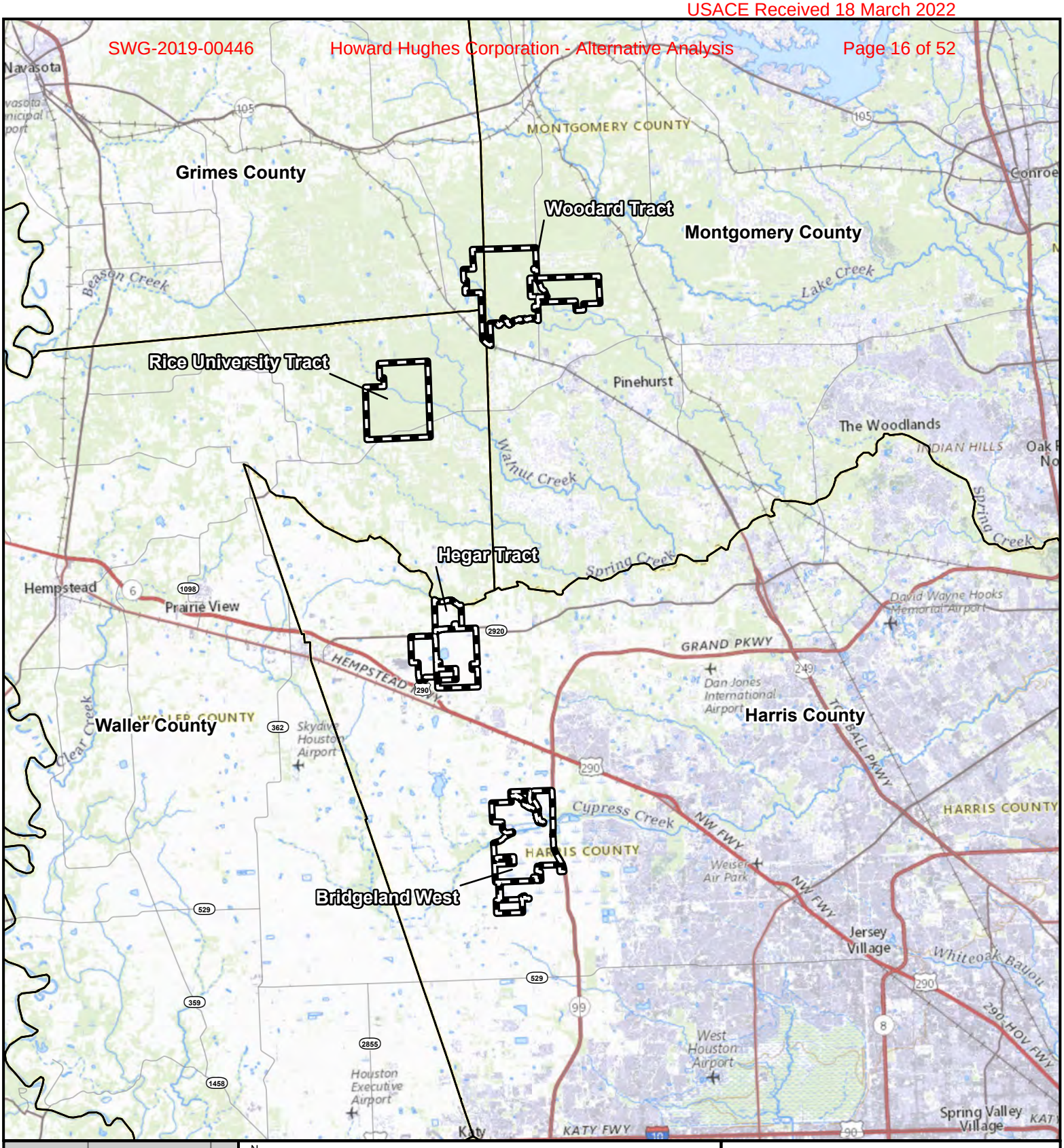

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Exhibit 1
Site Vicinity Map
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris, Waller, Grimes,
and Montgomery Counties, Texas

Prepared By: BGE	Scale: 1:315,000
Job No.: 6021-01	Date: February 2022

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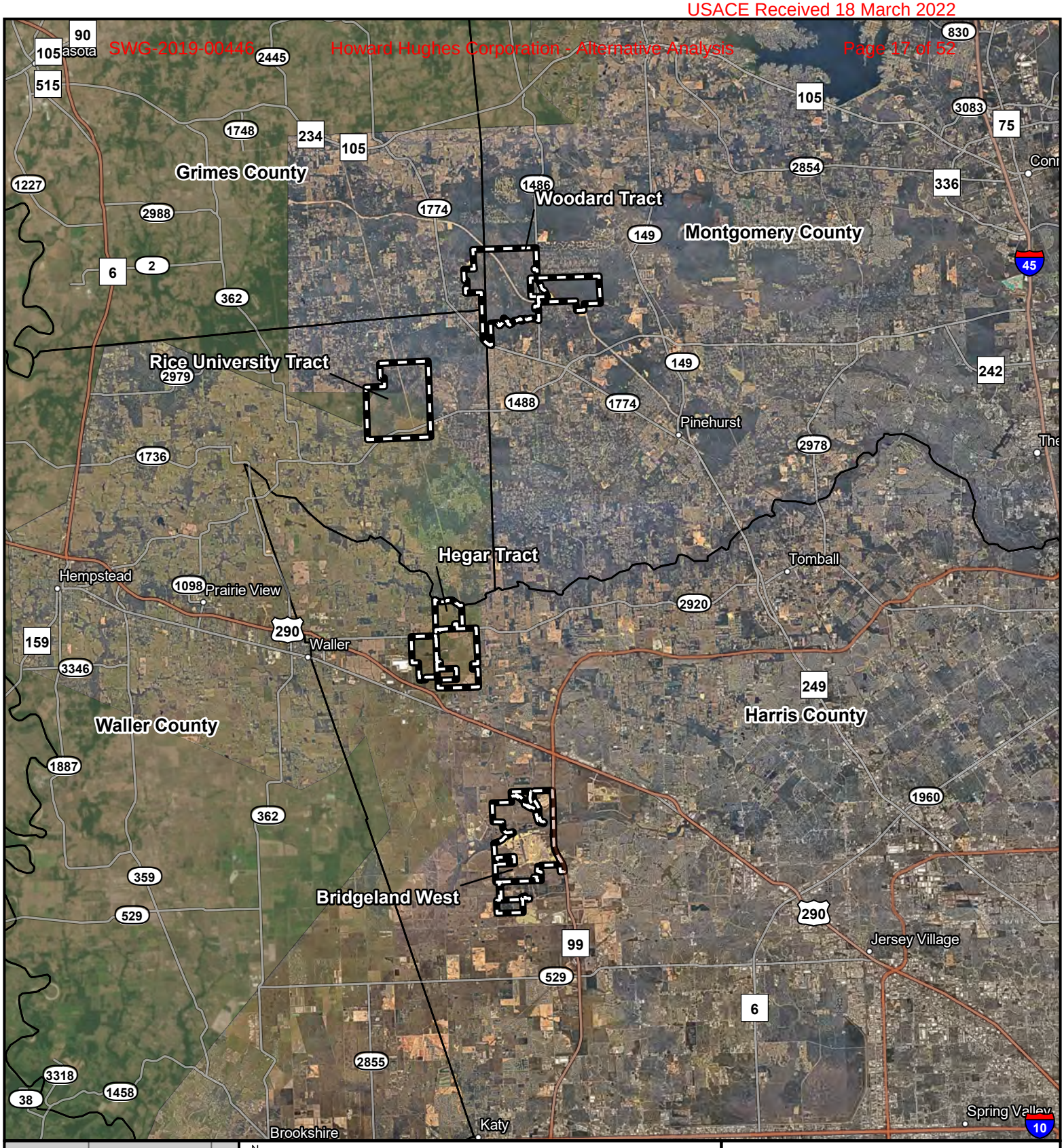

N

Project Boundary

County Boundary

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap and ESRI (2021)

0 2.5 5 Miles

0 4 8 Kilometers

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Exhibit 2
Site Vicinity Aerial Map
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris, Waller, Grimes,
and Montgomery Counties, Texas

Prepared By: BGE	Scale: 1:315,000
Job No.: 6021-01	Date: February 2022

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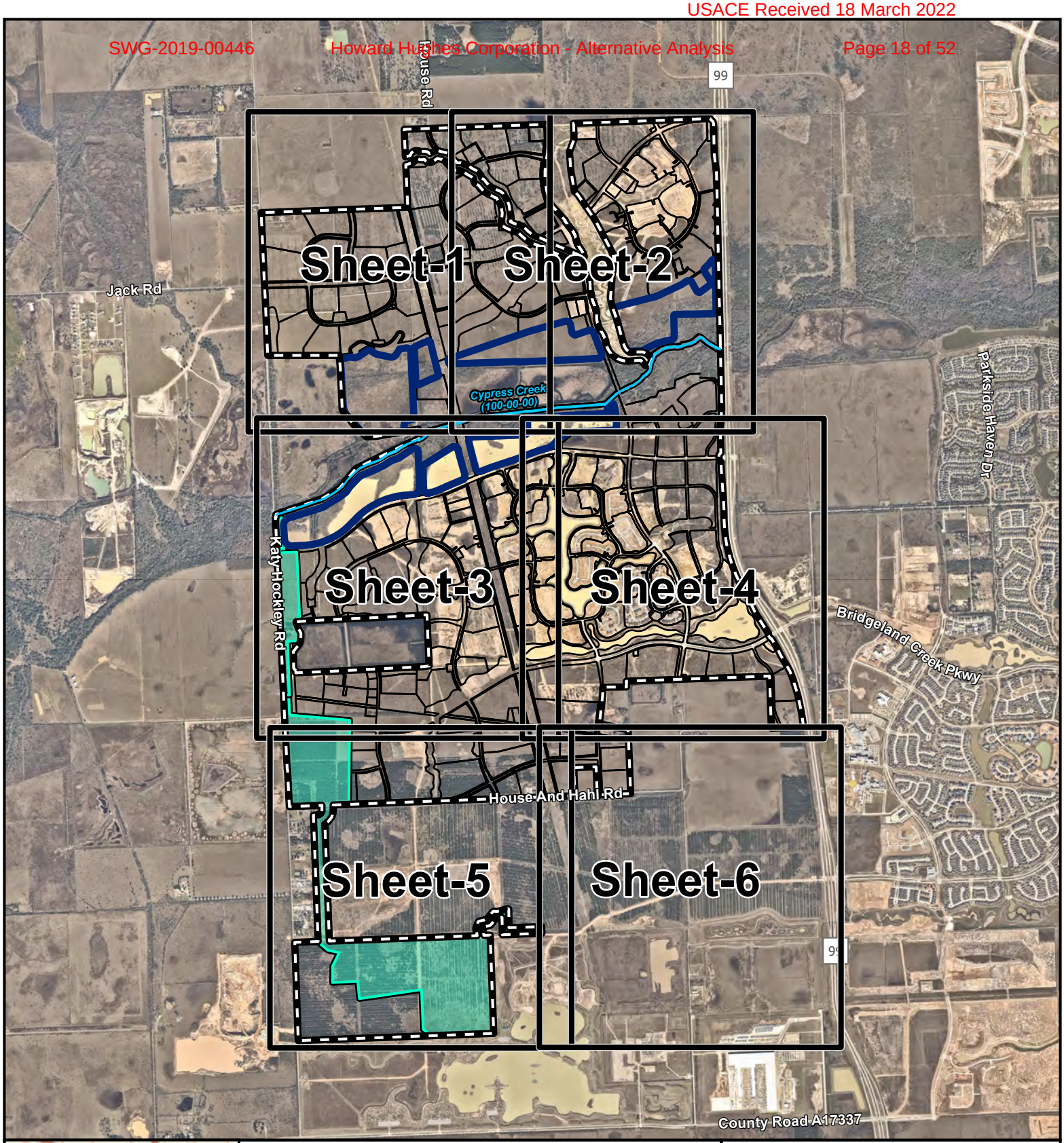

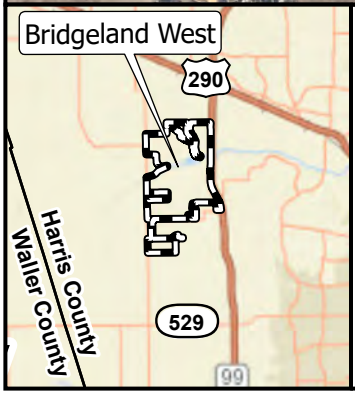

N

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,750 3,500 Feet

0 600 1,200 Meters

- Sheet Index Page
- Cypress Creek (K100-00-00)
- Project Boundary
- Bridgeland West Floodplain Mitigation Basin
- 2021 Landplan
- Overflow Area

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Exhibit 3
Proposed Impacts Map
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas

Prepared By: BGE	Scale: 1:42,000
Job No.: 6286-00	Date: February 2022

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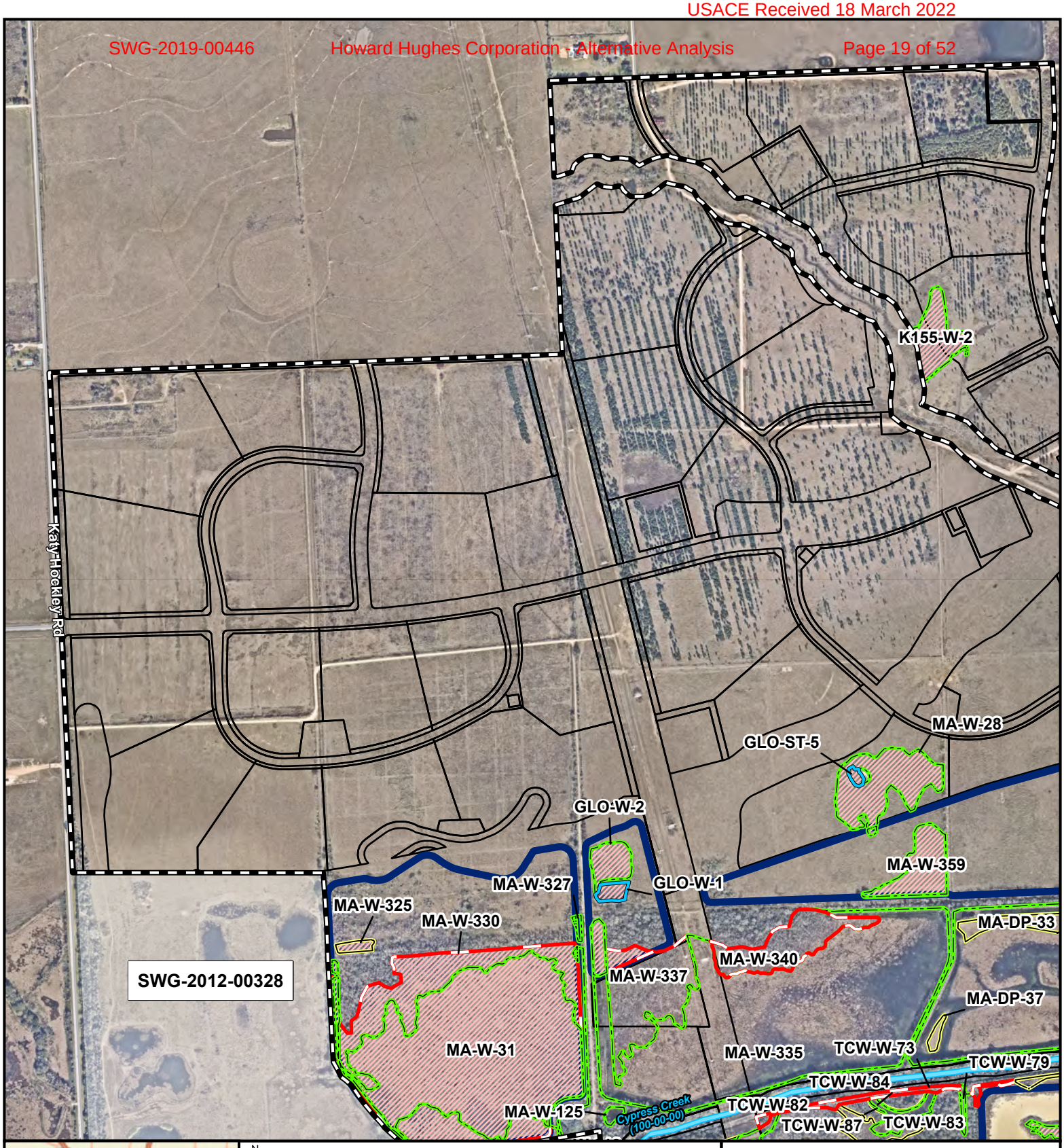

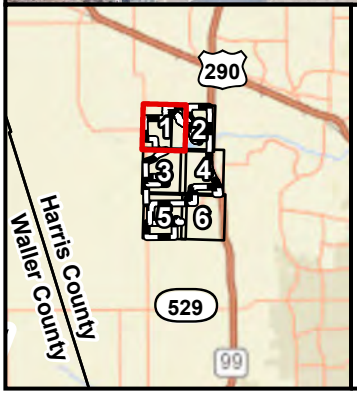

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

- Impact,PEM
- Impact,PFO1
- Impact,PSS
- Impact,PUBx
- Non-Impact,PEM
- Non-Impact,PFO1
- Non-Impact,PSS
- Non-Impact,PUBx

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Exhibit 3
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Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 1 of 6

Prepared By: BGE	Scale: 1:12,000
Job No.: 6286-00	Date: February 2022

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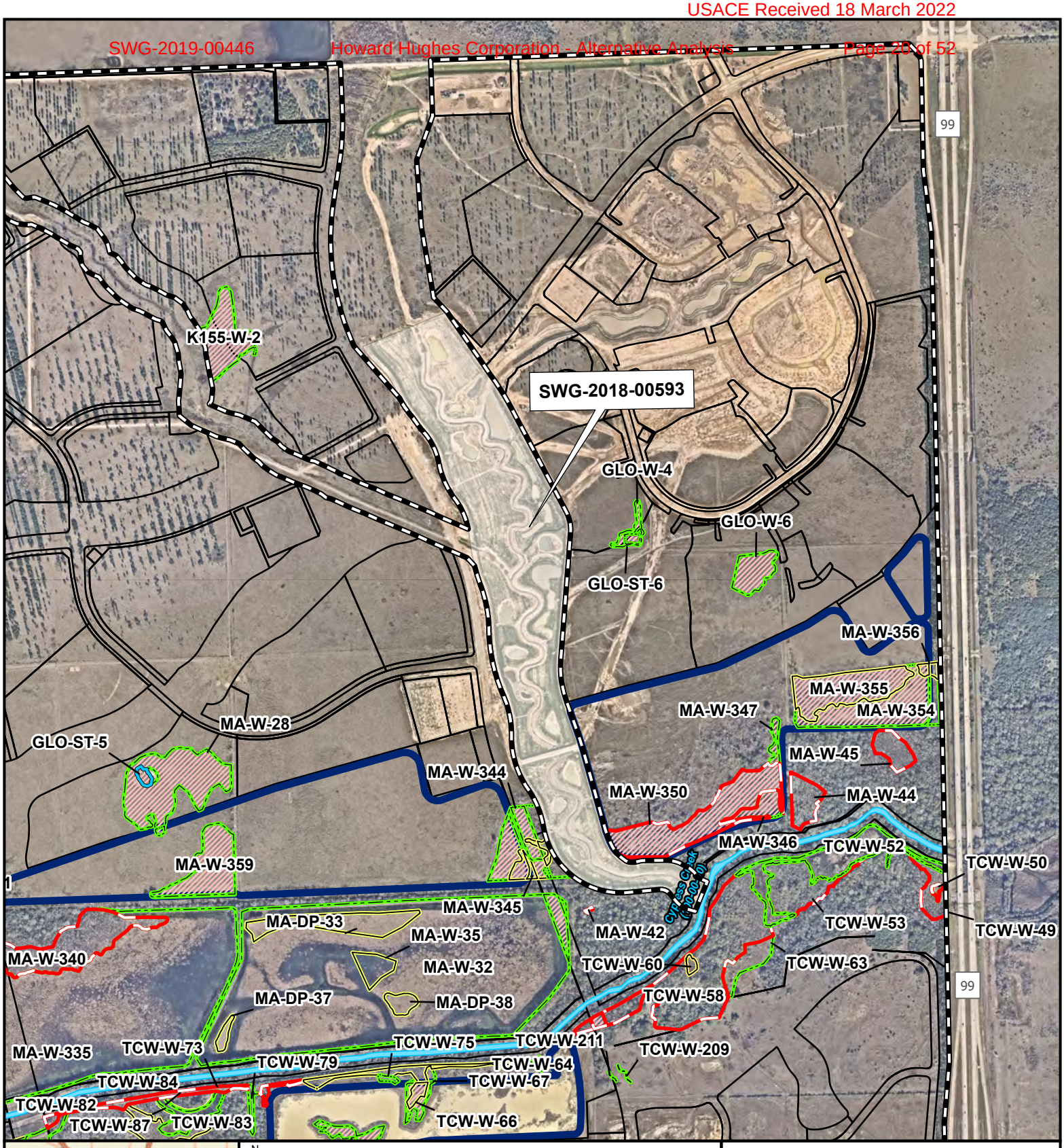

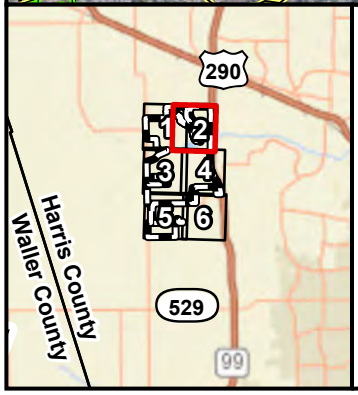

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- Project Boundary
- Cypress Creek (K100-00-00)
- Bridgeland West Floodplain Mitigation Basin
- Overflow Area
- 2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

- Impact,PEM
- Impact,PFO1
- Impact,PSS
- Impact,PUBx
- Non-Impact,PEM
- Non-Impact,PFO1
- Non-Impact,PSS
- Non-Impact,PUBx

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Exhibit 3
Proposed Impacts Map
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 2 of 6

Prepared By: BGE	Scale: 1:12,000
Job No.: 6286-00	Date: February 2022

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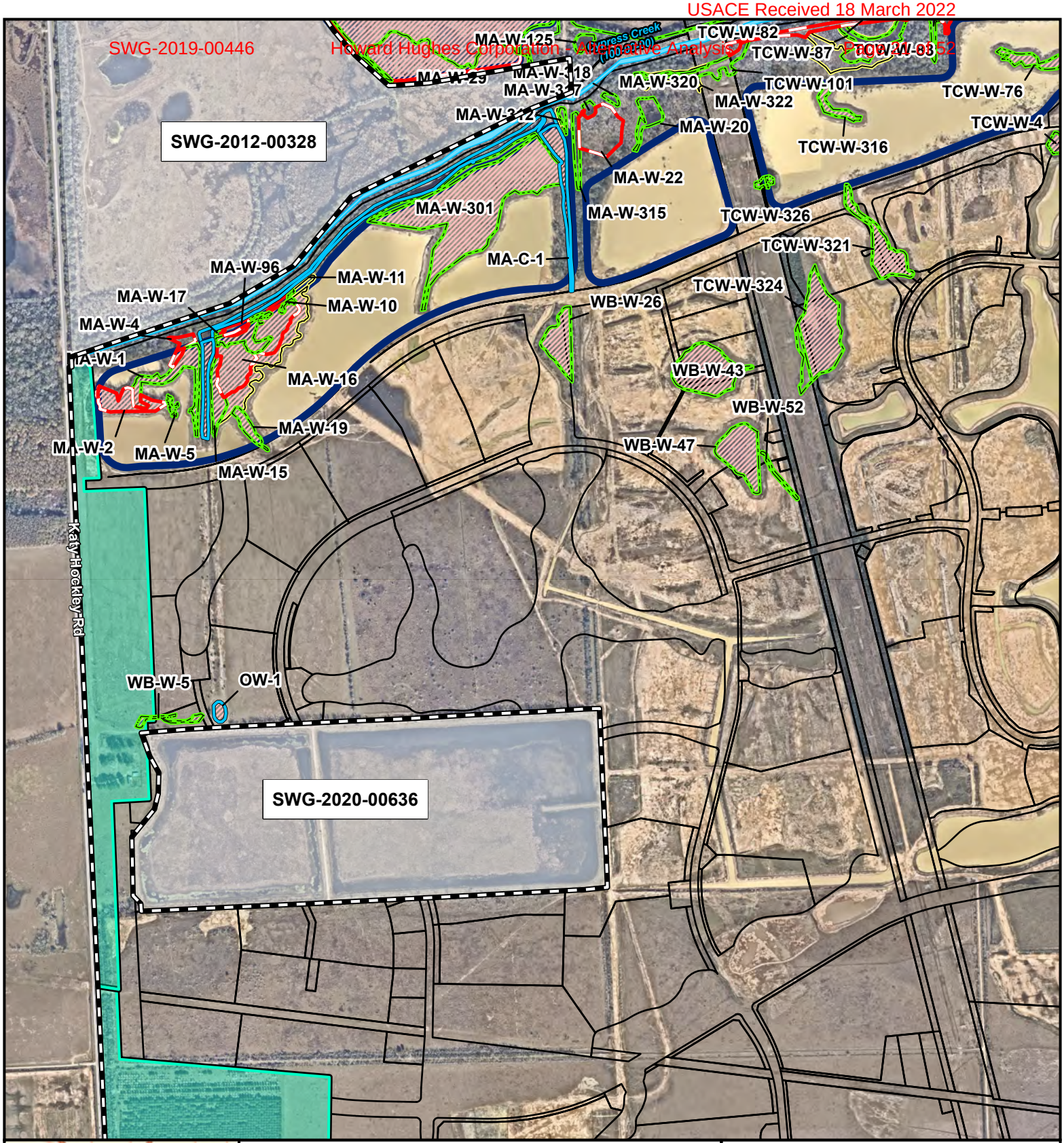
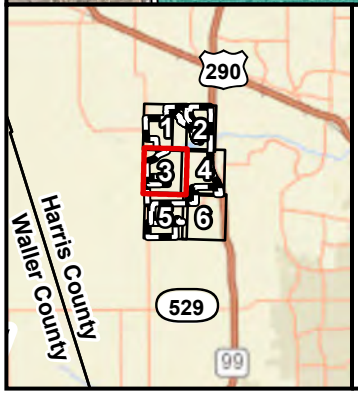
SWG-2019-00446 Howard Hughes Corporation Alternative Analysis Page 52





N

Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

- Impact,PEM
- Impact,PFO1
- Impact,PSS
- Impact,PUBx
- Non-Impact,PEM
- Non-Impact,PFO1
- Non-Impact,PSS
- Non-Impact,PUBx

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Exhibit 3
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Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 3 of 6

Prepared By: BGE	Scale: 1:12,000
Job No.: 6286-00	Date: February 2022

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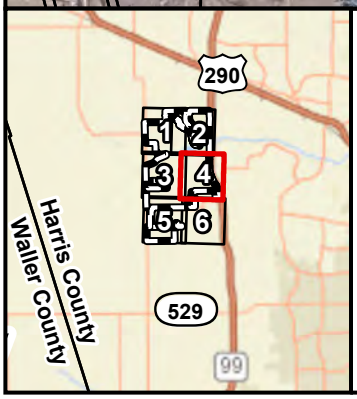

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- Project Boundary
- Cypress Creek (K100-00-00)
- Bridgeland West Floodplain Mitigation Basin
- Overflow Area
- 2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

- Impact,PEM
- Impact,PFO1
- Impact,PSS
- Impact,PUBx
- Non-Impact,PEM
- Non-Impact,PFO1
- Non-Impact,PSS
- Non-Impact,PUBx

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Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 4 of 6

Prepared By: BGE	Scale: 1:12,000
Job No.: 6286-00	Date: February 2022

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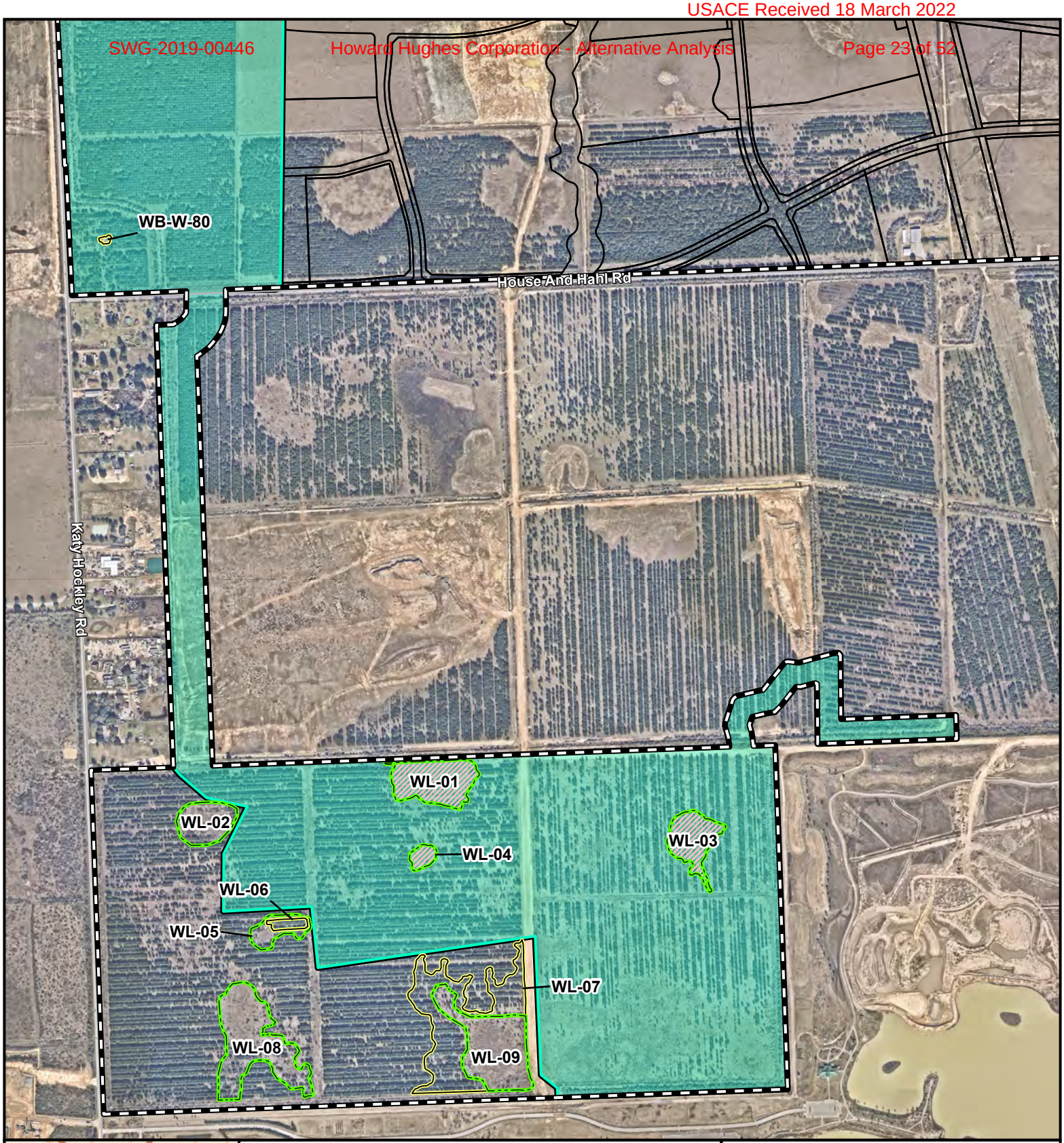

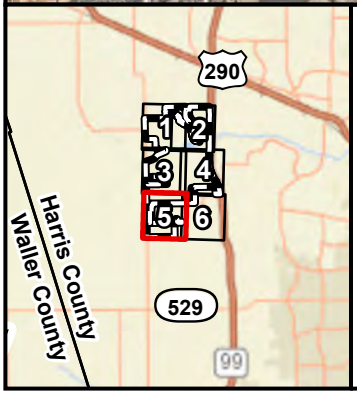

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

- Impact,PEM
- Impact,PFO1
- Impact,PSS
- Impact,PUBx
- Non-Impact,PEM
- Non-Impact,PFO1
- Non-Impact,PSS
- Non-Impact,PUBx

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Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 5 of 6

Prepared By: BGE	Scale: 1:12,000
Job No.: 6286-00	Date: February 2022

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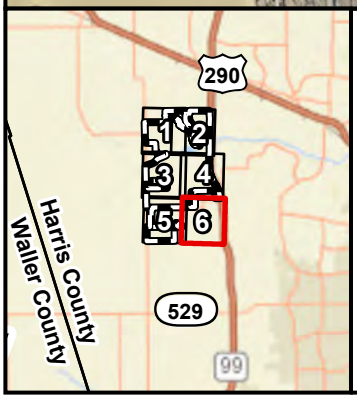

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

- Impact,PEM
- Impact,PFO1
- Impact,PSS
- Impact,PUBx
- Non-Impact,PEM
- Non-Impact,PFO1
- Non-Impact,PSS
- Non-Impact,PUBx

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Exhibit 3
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Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 6 of 6

Prepared By: BGE	Scale: 1:12,000
Job No.: 6286-00	Date: February 2022

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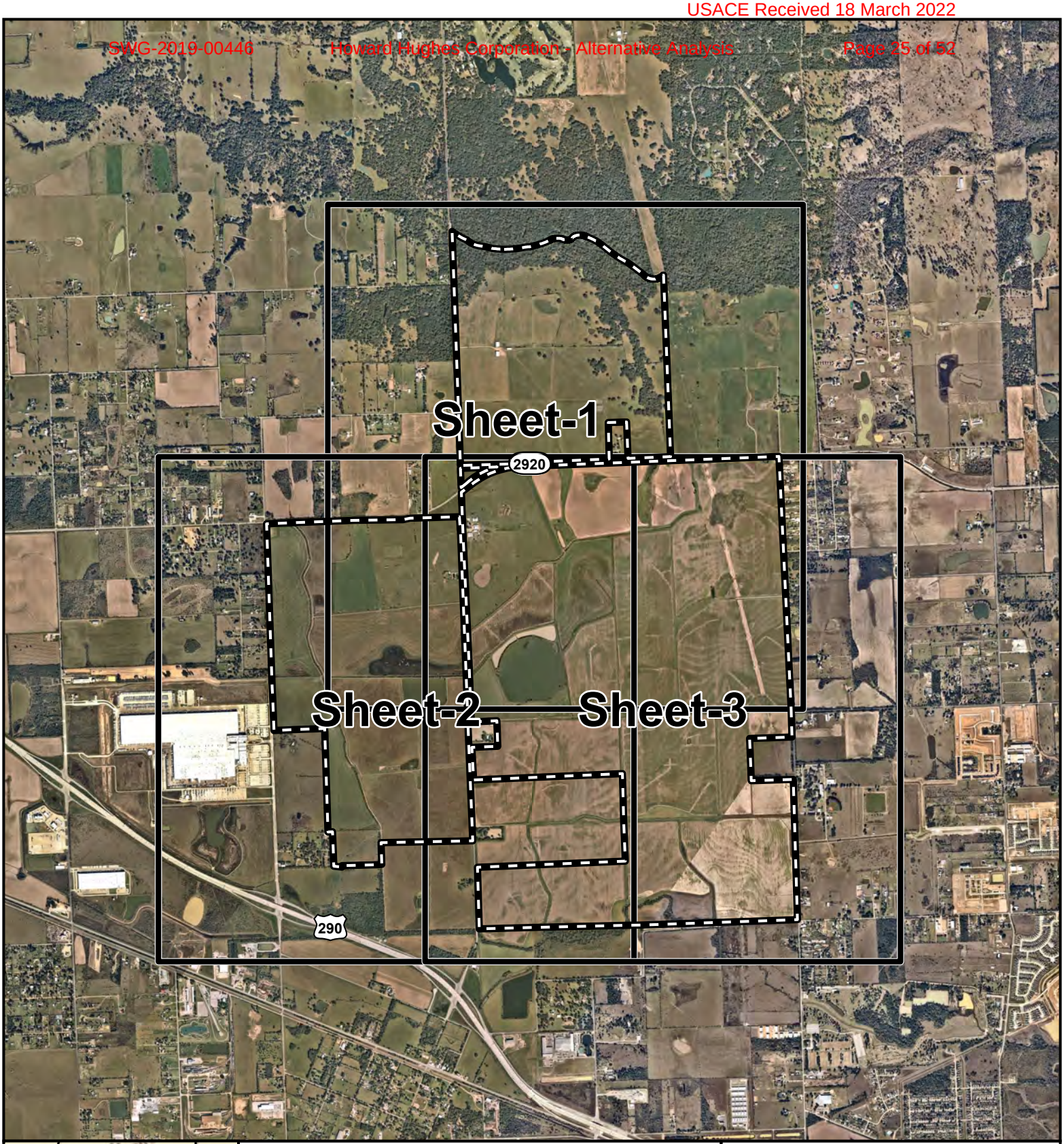

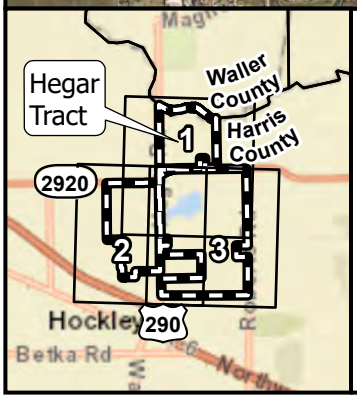

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Sheet Index Page

Project Boundary

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,750 3,500 Feet

0 570 1,140 Meters

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Exhibit 4
Offsite Alternative 1 Map - Hegar Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas

Prepared By: BGE	Scale: 1:40,000
Job No.: 6286-00	Date: February 2022

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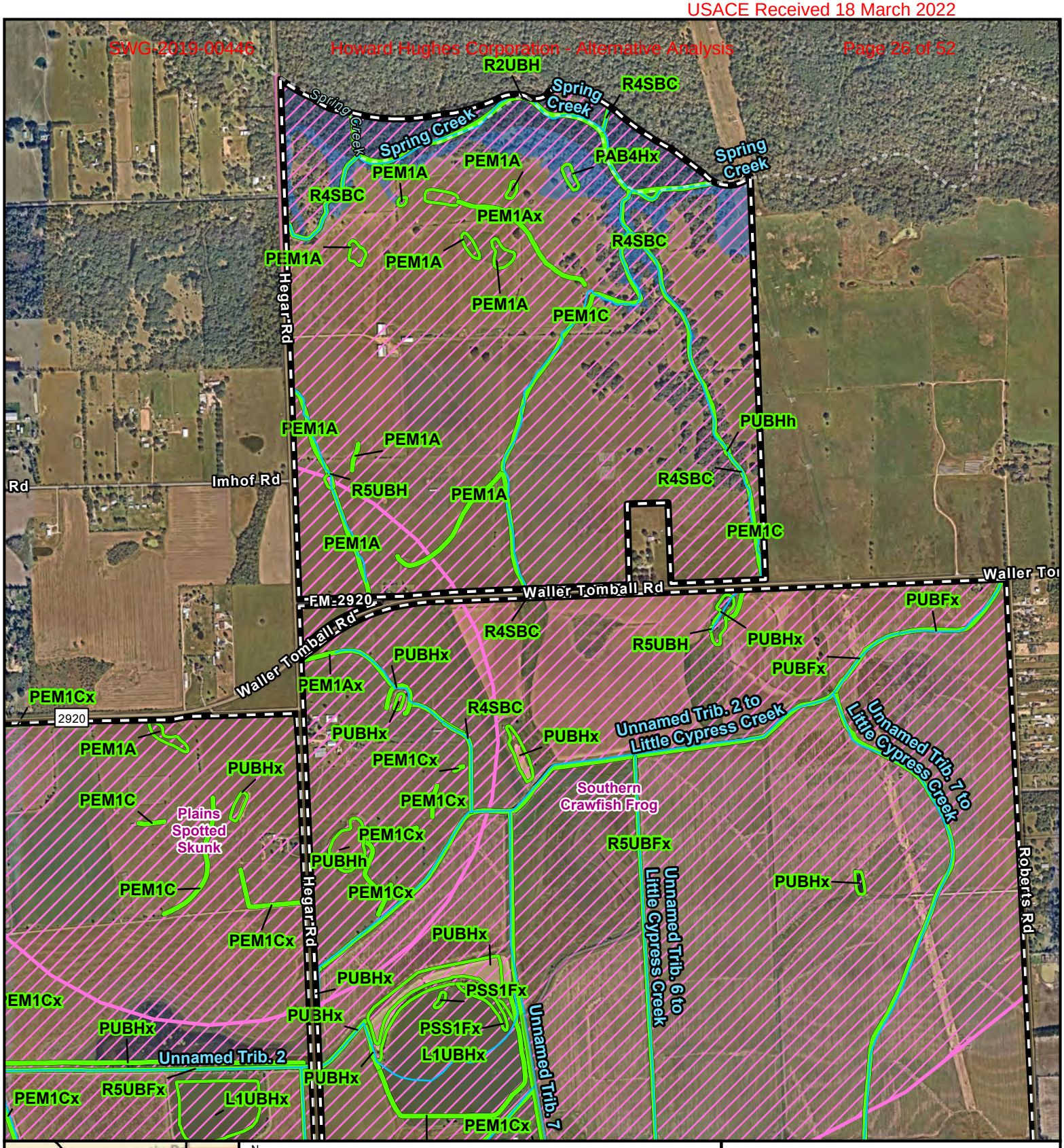

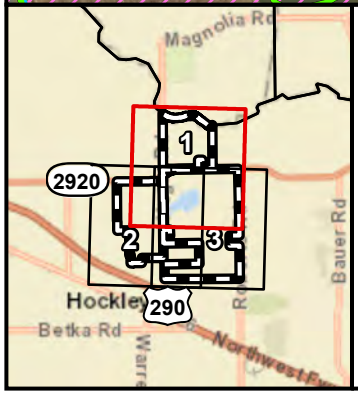

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Datum: NAD 1983
Projection: Texas State Planes
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- TXNDD Element Occurrence
- Floodway
- 100-year Floodplain
- Stream (NHD)

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Exhibit 4
Offsite Alternative 1 Map - Hegar Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 1 of 3

Prepared By: BGE	Scale: 1:18,000
Job No.: 6286-00	Date: February 2022

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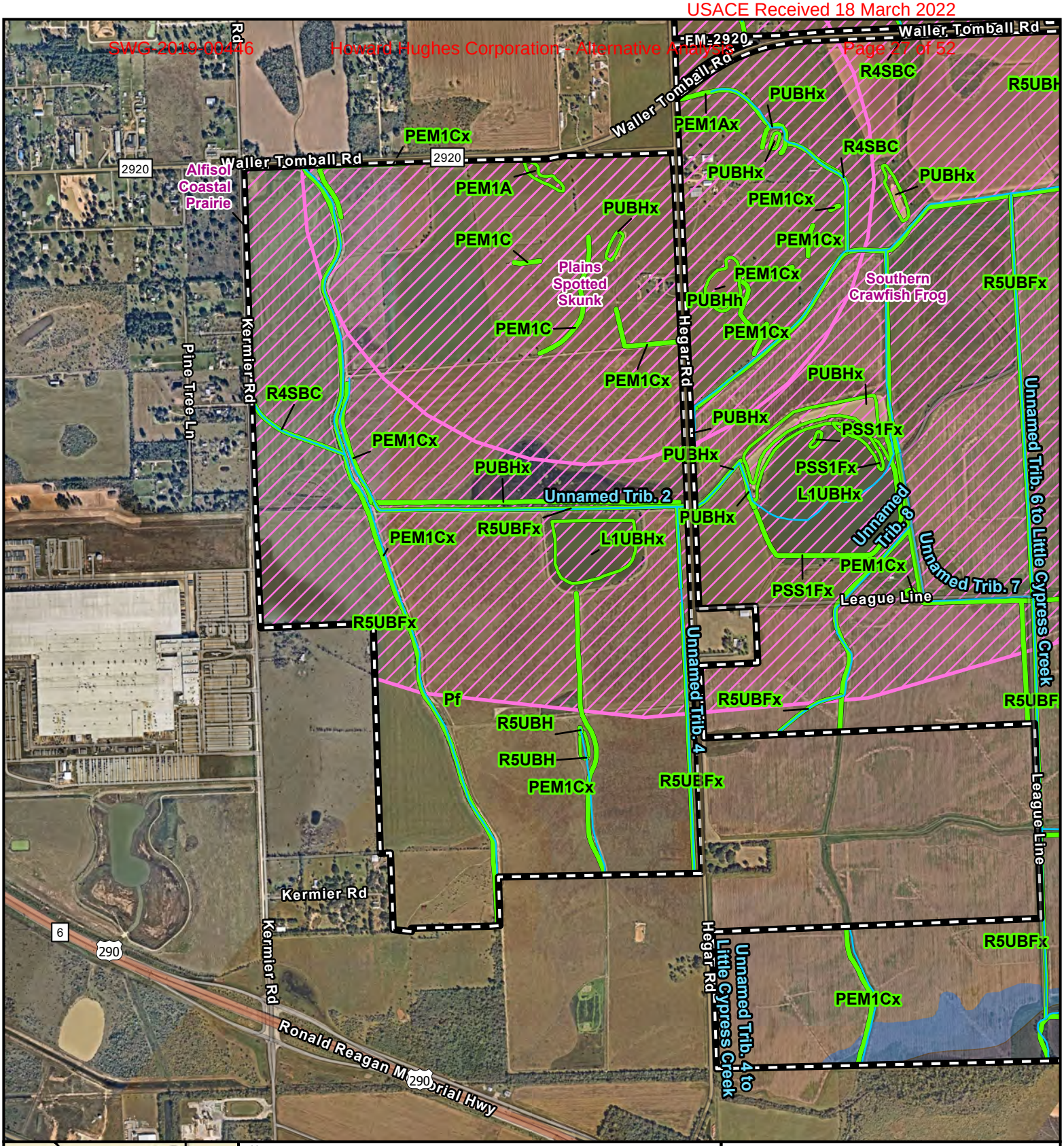

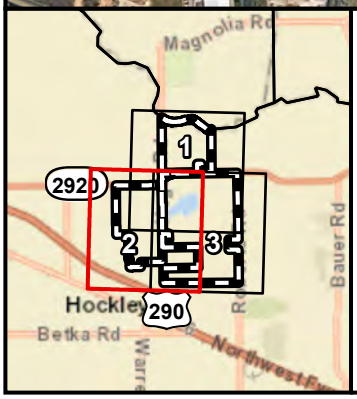

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Datum: NAD 1983
Projection: Texas State Planes
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- TXNDD Element Occurrence
- Floodway
- 100-year Floodplain
- Stream (NHD)

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Exhibit 4
Offsite Alternative 1 Map - Hegar Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 2 of 3

Prepared By: BGE	Scale: 1:18,000
Job No.: 6286-00	Date: February 2022

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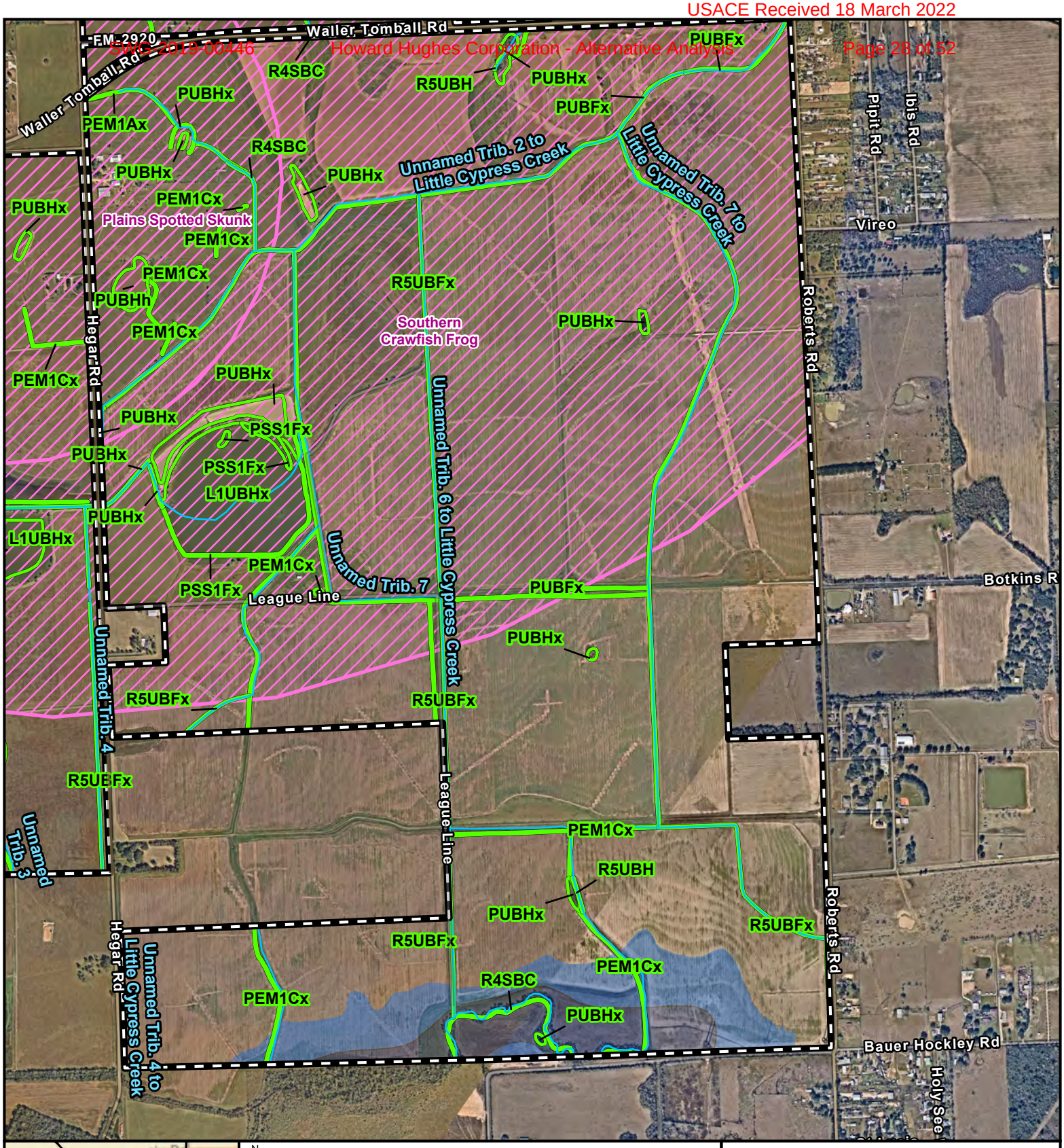

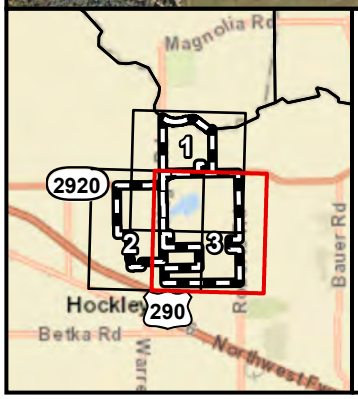

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Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- TXNDD Element Occurrence
- Floodway
- 100-year Floodplain
- Stream (NHD)

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Exhibit 4
Offsite Alternative 1 Map - Hegar Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 3 of 3

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Job No.: 6286-00	Date: February 2022

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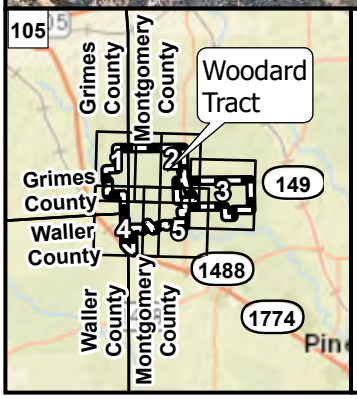

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Sheet Index Page
Project Boundary

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,750 3,500 Feet

0 600 1,200 Meters

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Exhibit 5
Offsite Alternative 2 Map - Woodard Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Montgomery, and Grimes Counties, Texas

Prepared By: BGE	Scale: 1:50,000
Job No.: 6286-00	Date: February 2022

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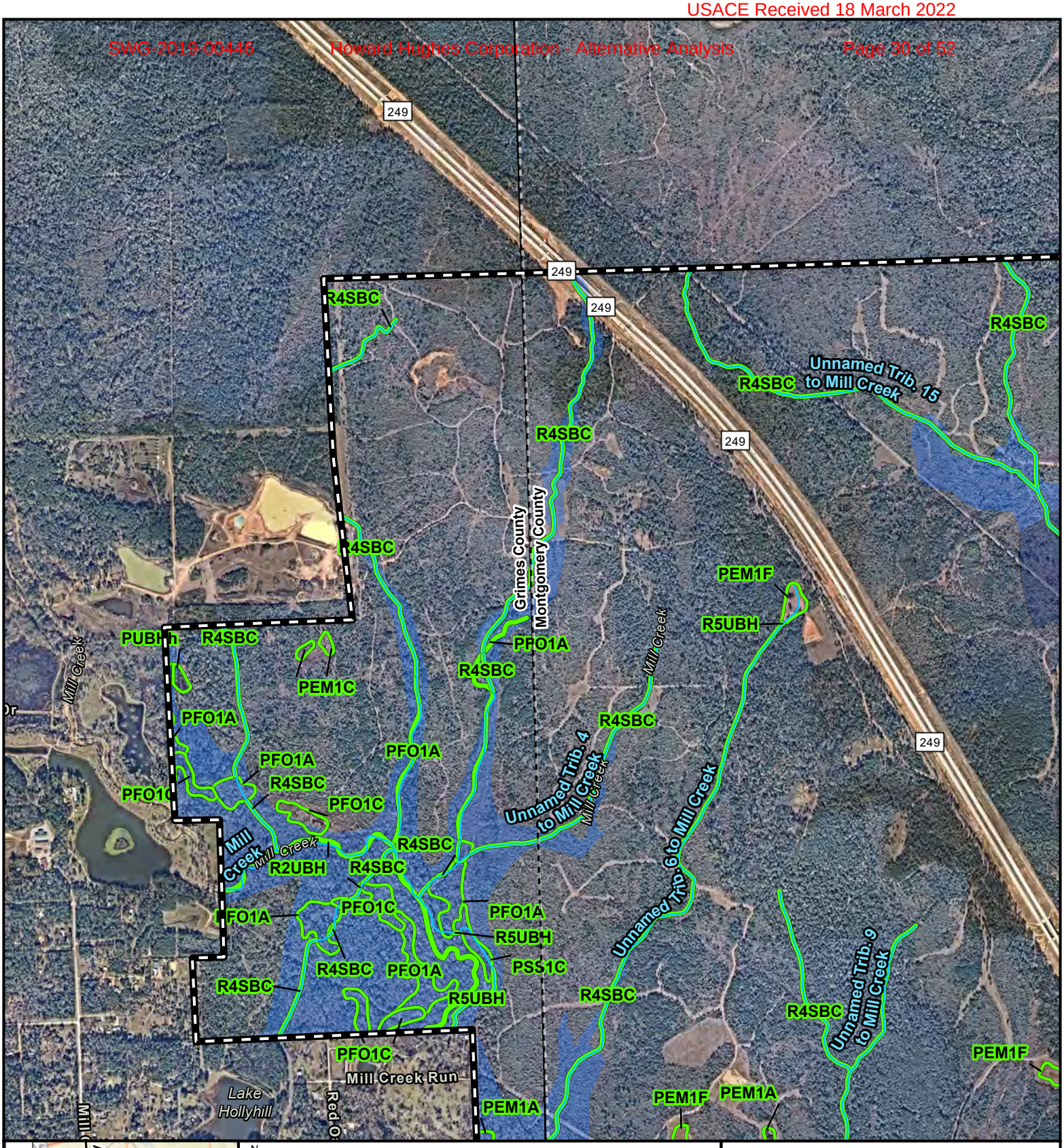

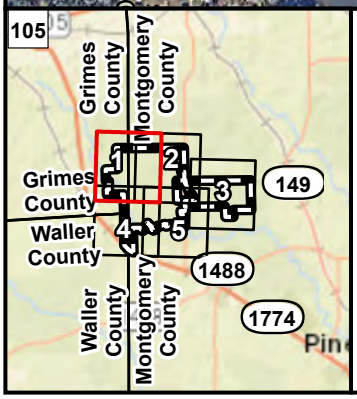

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Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: NearMap and ESRI (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- Floodway
- 100-year Floodplain
- County Line
- Stream (NHD)

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Exhibit 5
Offsite Alternative 2 Map - Woodard Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Montgomery, and Grimes Counties, Texas
Page 1 of 5

Prepared By: BGE	Scale: 1:18,000
Job No.: 6286-00	Date: February 2022

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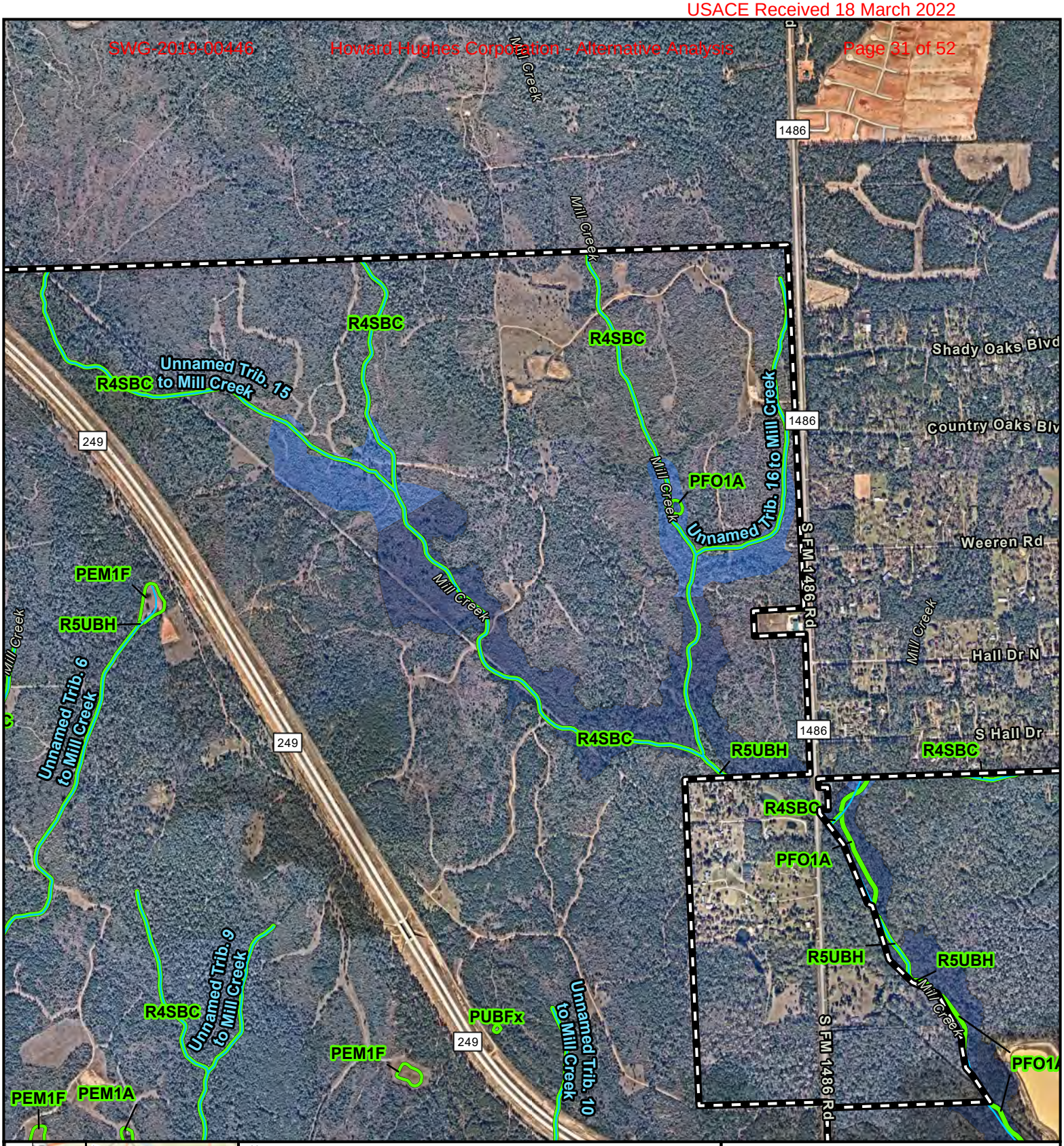

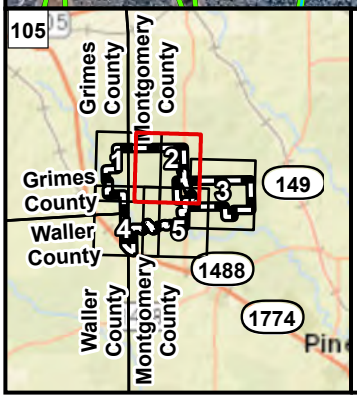

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Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: NearMap and ESRI (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- Floodway
- 100-year Floodplain
- County Line
- Stream (NHD)

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Exhibit 5
Offsite Alternative 2 Map - Woodard Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Montgomery, and Grimes Counties, Texas
Page 2 of 5

Prepared By: BGE	Scale: 1:18,000
Job No.: 6286-00	Date: February 2022

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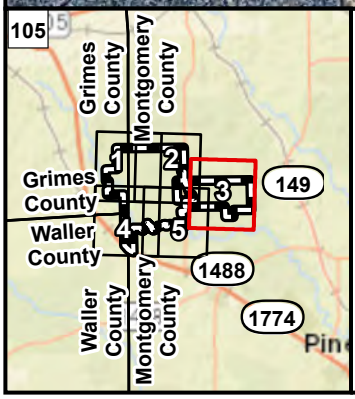

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Datum: NAD 1983
Projection: Texas State Planar
Zone: South Central
Units: Feet
Basemap: NearMap and ESRI (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- Floodway
- 100-year Floodplain
- County Line
- Stream (NHD)

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Exhibit 5
Offsite Alternative 2 Map - Woodard Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Montgomery, and Grimes Counties, Texas
Page 3 of 5

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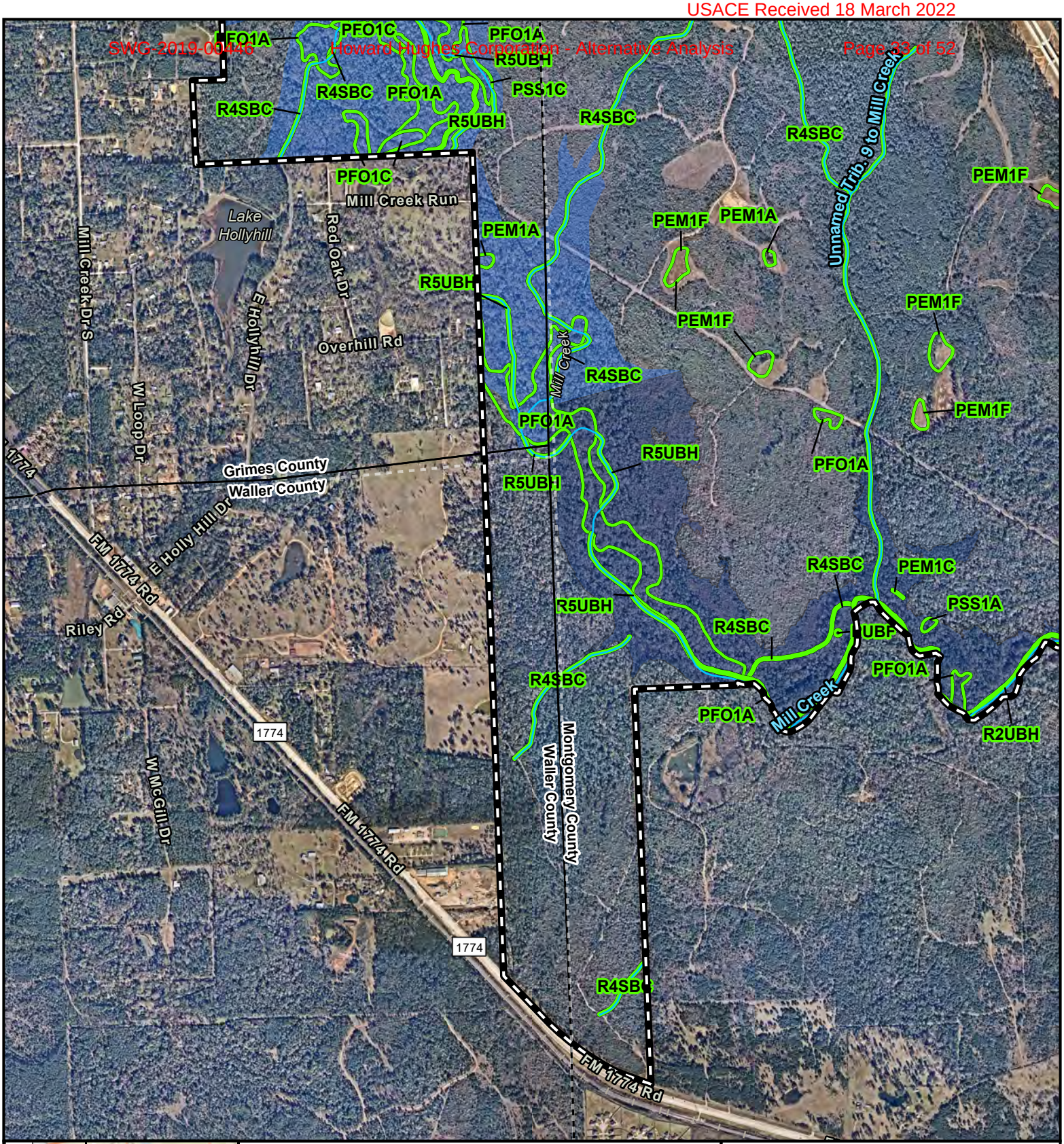

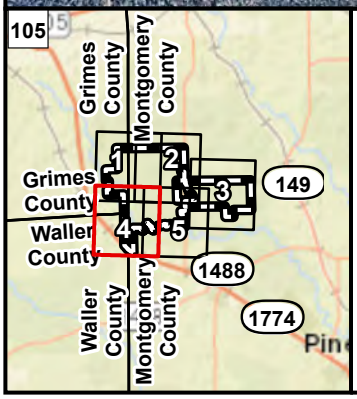

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Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: NearMap and ESRI (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- Floodway
- 100-year Floodplain
- County Line
- Stream (NHD)

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Exhibit 5
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Alternatives Analysis
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4,594-acre Bridgeland West Project
SWG-2019-00446
Montgomery, and Grimes Counties, Texas
Page 4 of 5

Prepared By: BGE	Scale: 1:18,000
Job No.: 6286-00	Date: February 2022

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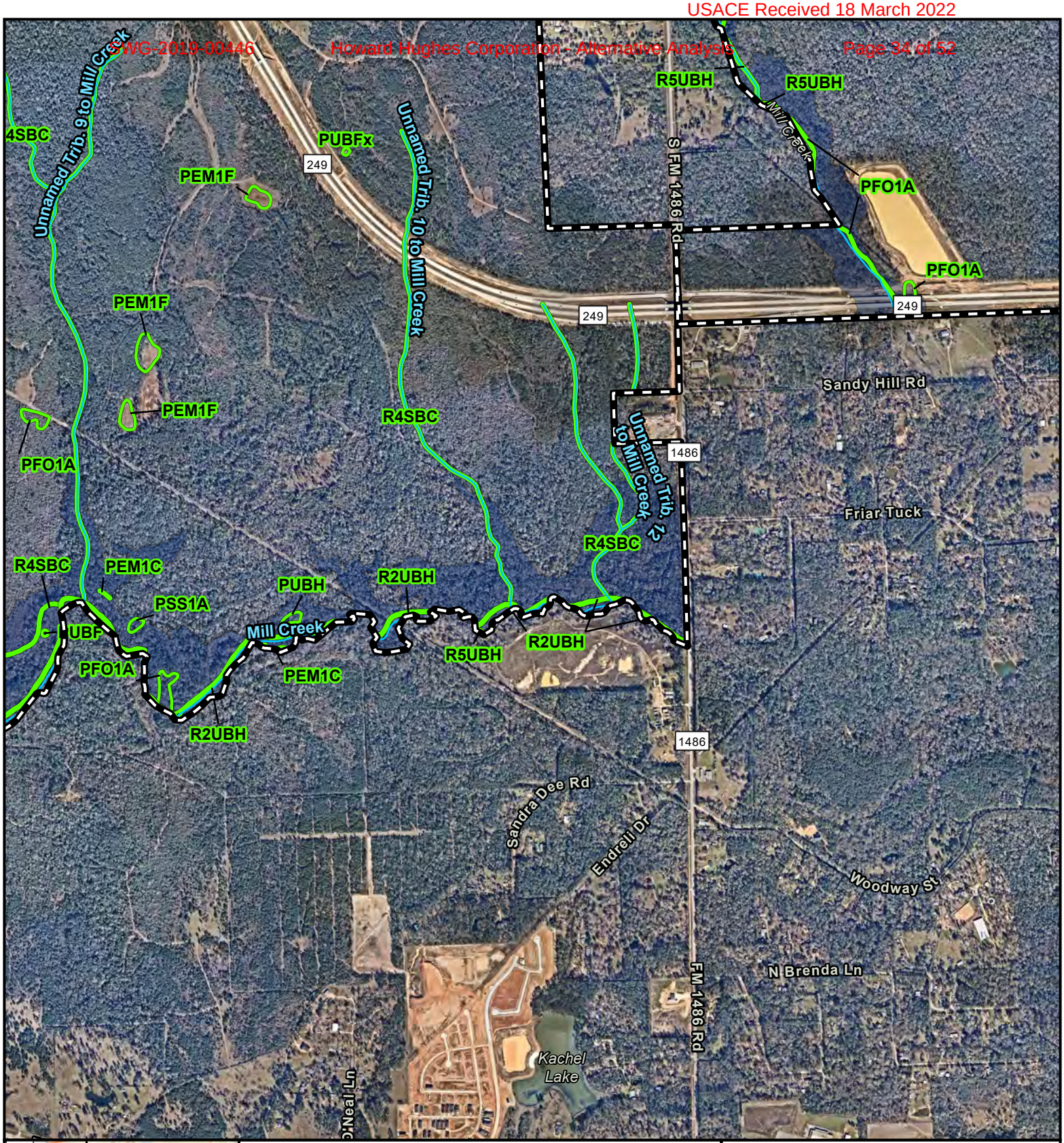

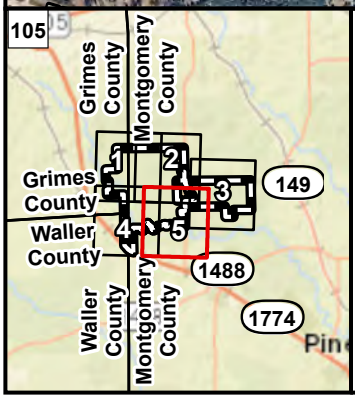

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Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: NearMap and ESRI (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- Floodway
- 100-year Floodplain
- County Line
- Stream (NHD)

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Exhibit 5
Offsite Alternative 2 Map - Woodard Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Montgomery, and Grimes Counties, Texas
Page 5 of 5

Prepared By: BGE	Scale: 1:18,000
Job No.: 6286-00	Date: February 2022

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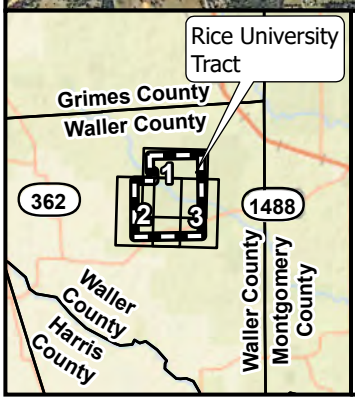

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Sheet Index Page
Project Boundary

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,750 3,500 Feet

0 570 1,140 Meters

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Exhibit 6
Offsite Alternative 3 Map - Rice University Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Waller County, Texas

Prepared By: BGE	Scale: 1:40,000
Job No.: 6286-00	Date: February 2022

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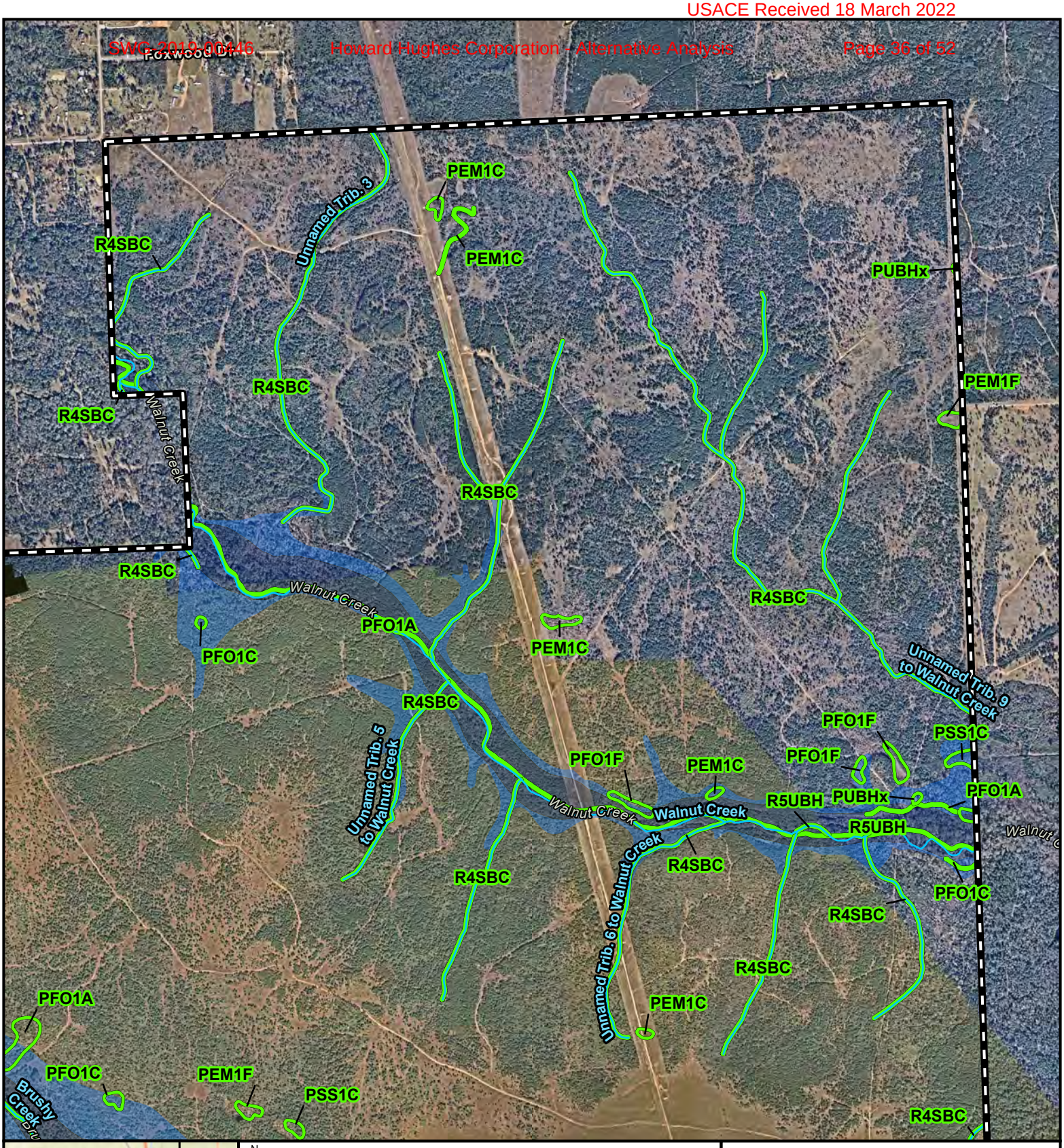

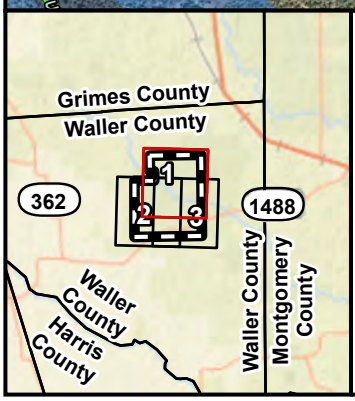

N

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap and ESRI (2021)

0 1,000 2,000 Feet

0 300 600 Meters

- Project Boundary
- National Wetland Inventory Wetland
- Floodway
- 100-year Floodplain
- Stream (NHD)

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Exhibit 6
Offsite Alternative 3 Map - Rice University Tract
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Waller County, Texas
Page 1 of 3

Prepared By: BGE	Scale: 1:18,000
Job No.: 6286-00	Date: February 2022

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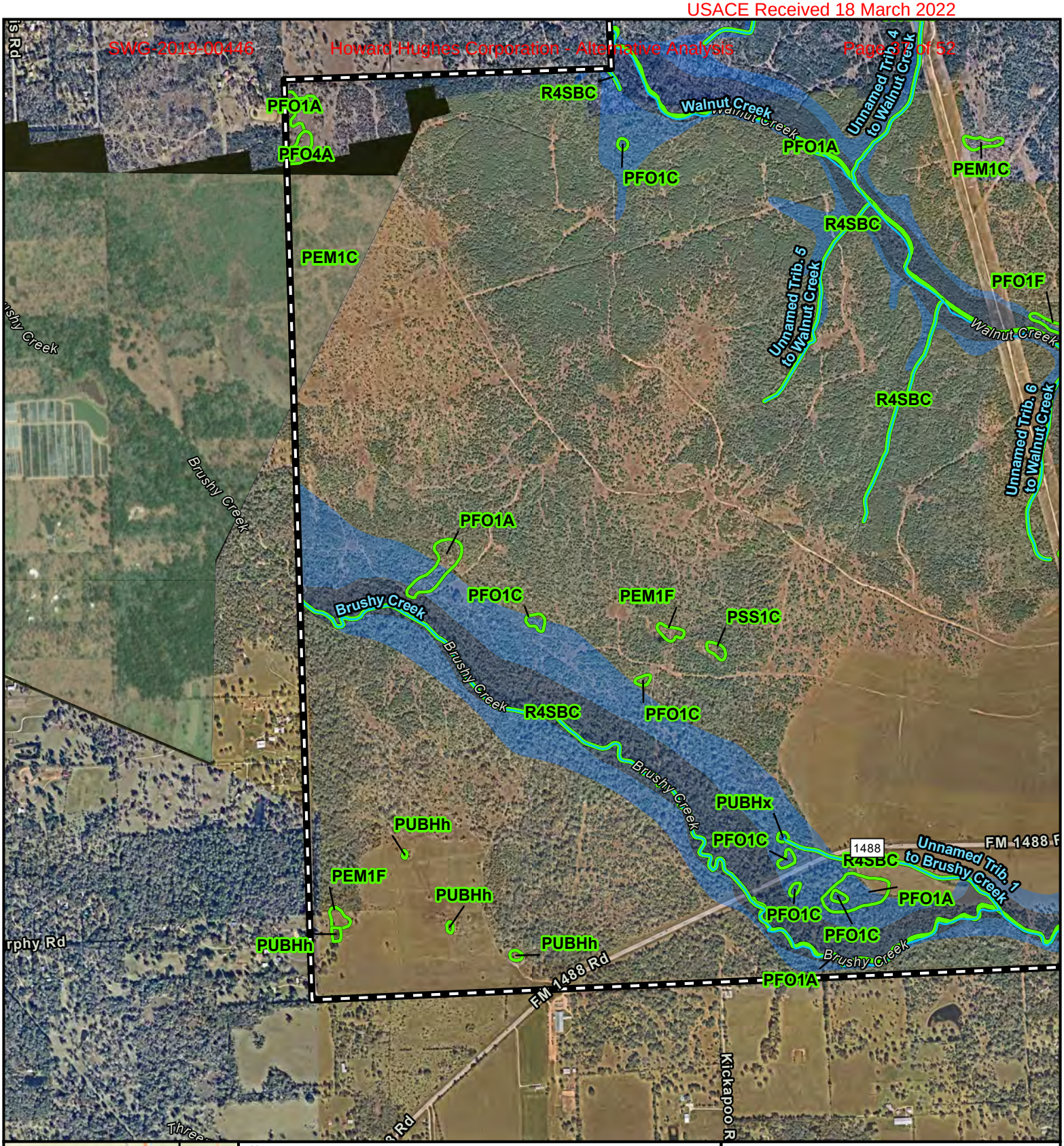

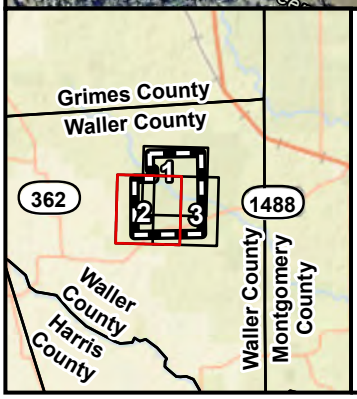

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Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap and ESRI (2021)

0 1,000 2,000 Feet

0 300 600 Meters

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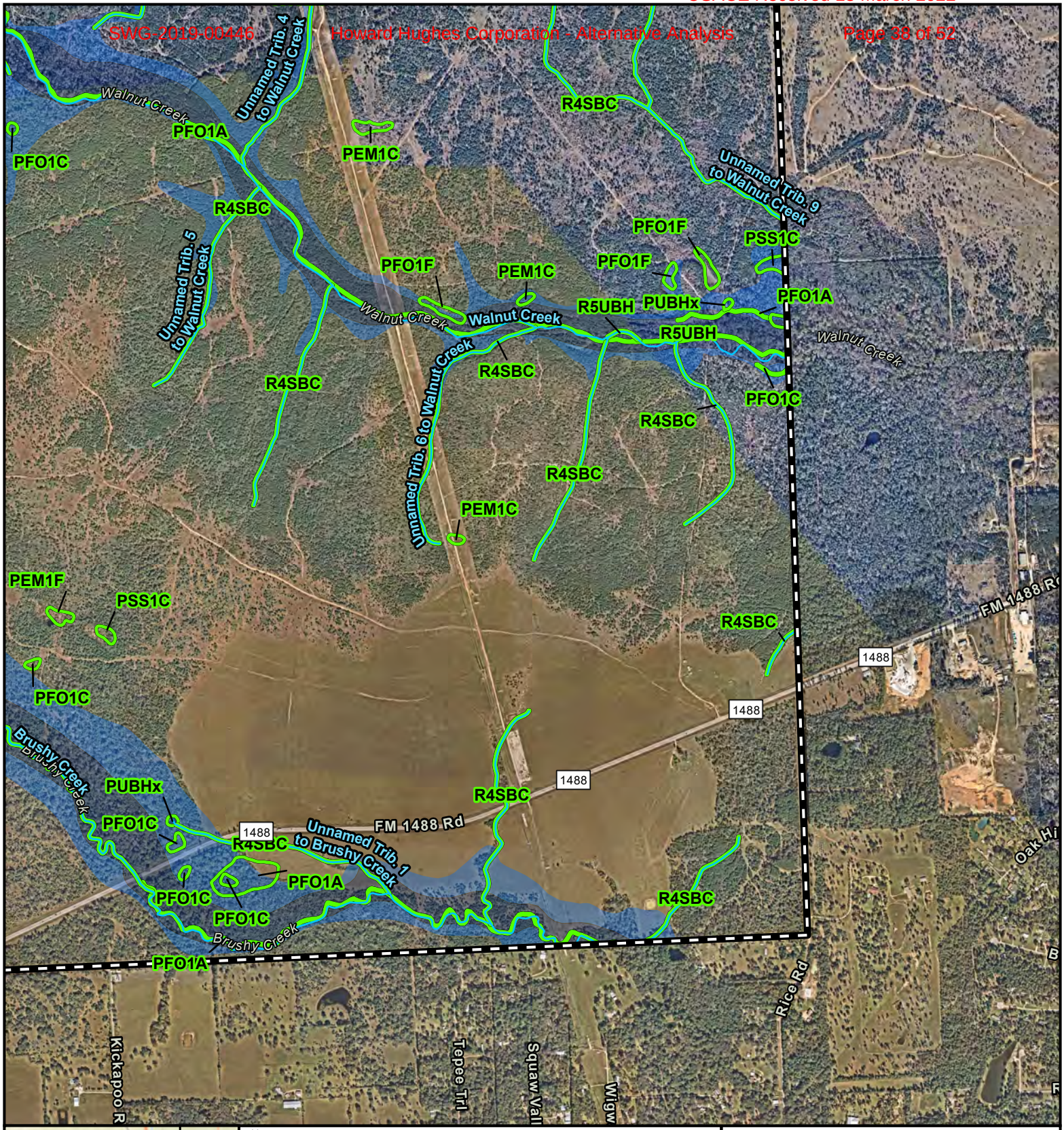

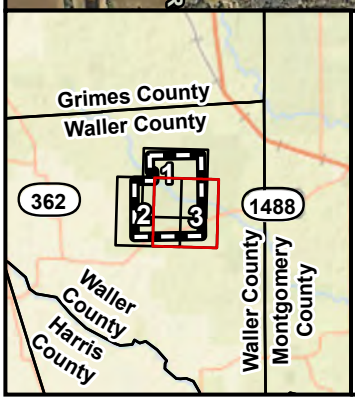

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Datum: NAD 1983
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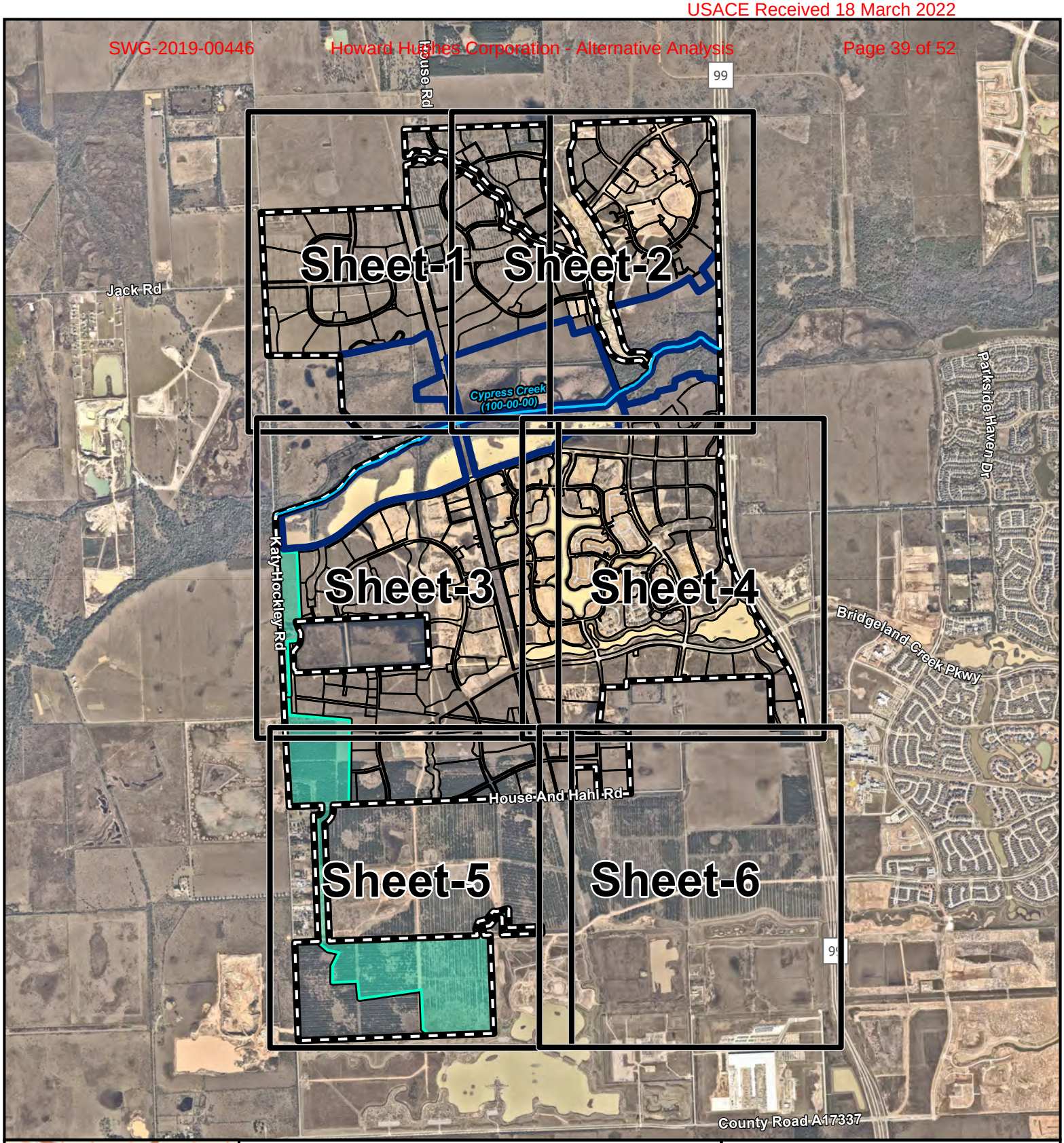

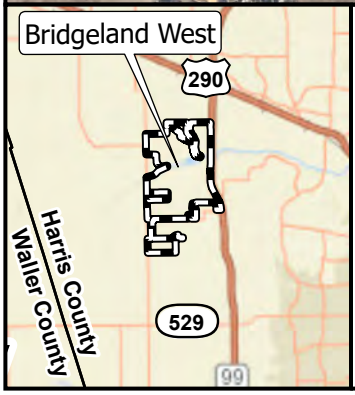

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Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,750 3,500 Feet

0 600 1,200 Meters

- Sheet Index Page
- Cypress Creek (K100-00-00)
- Project Boundary
- Bridgeland West Floodplain Mitigation Basin
- 2021 Landplan
- Overflow Area

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Exhibit 7
Onsite Alternative 1 Map
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas

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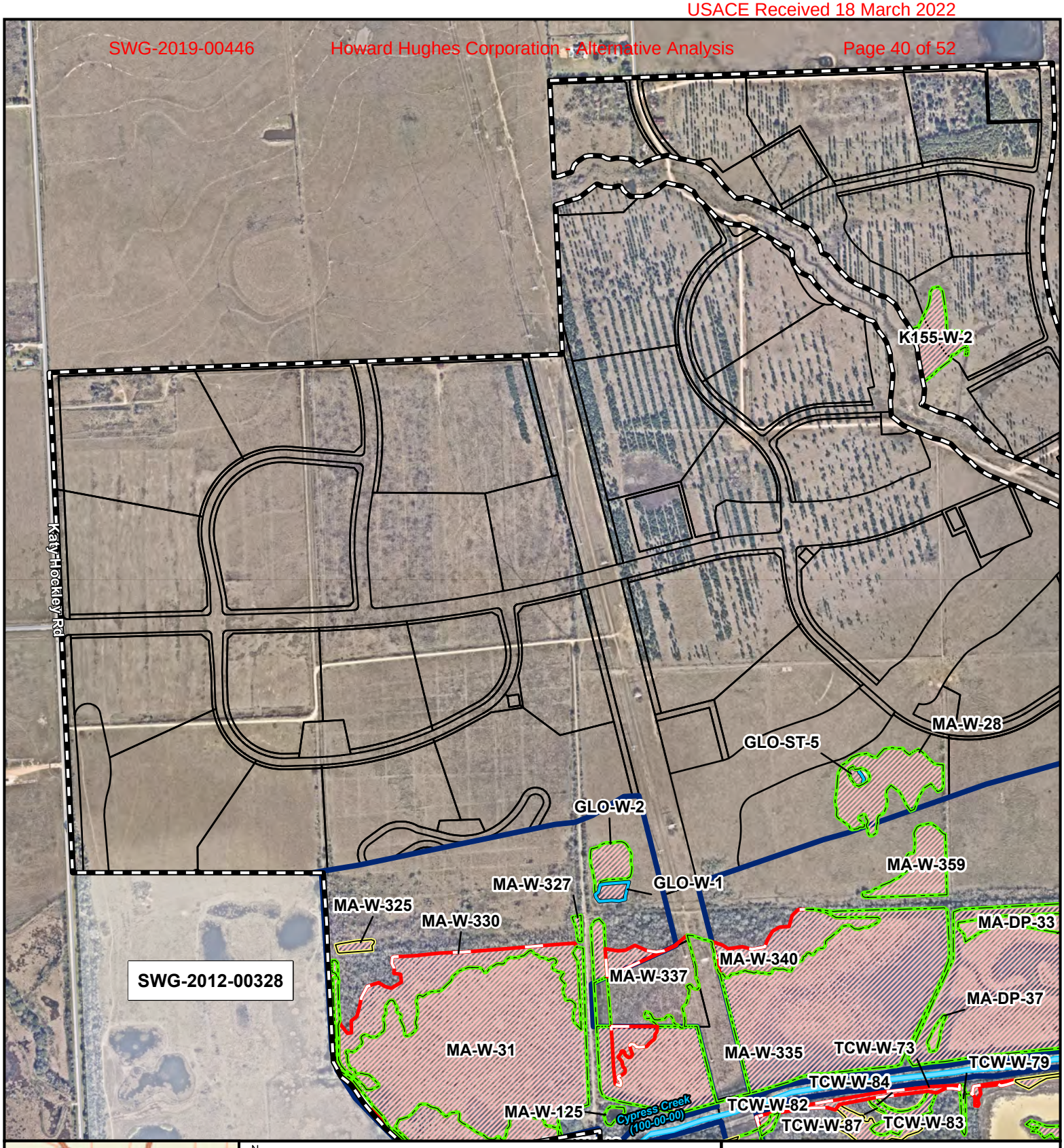

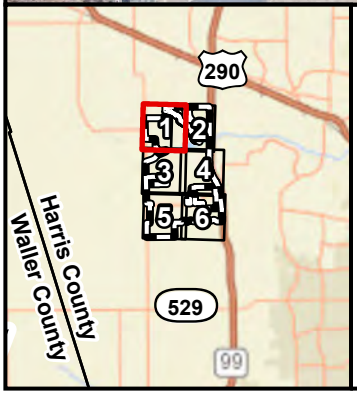

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

- Impact,PEM
- Impact,PFO1
- Impact,PSS
- Impact,PUBx
- Non-Impact,PEM
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4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 1 of 6

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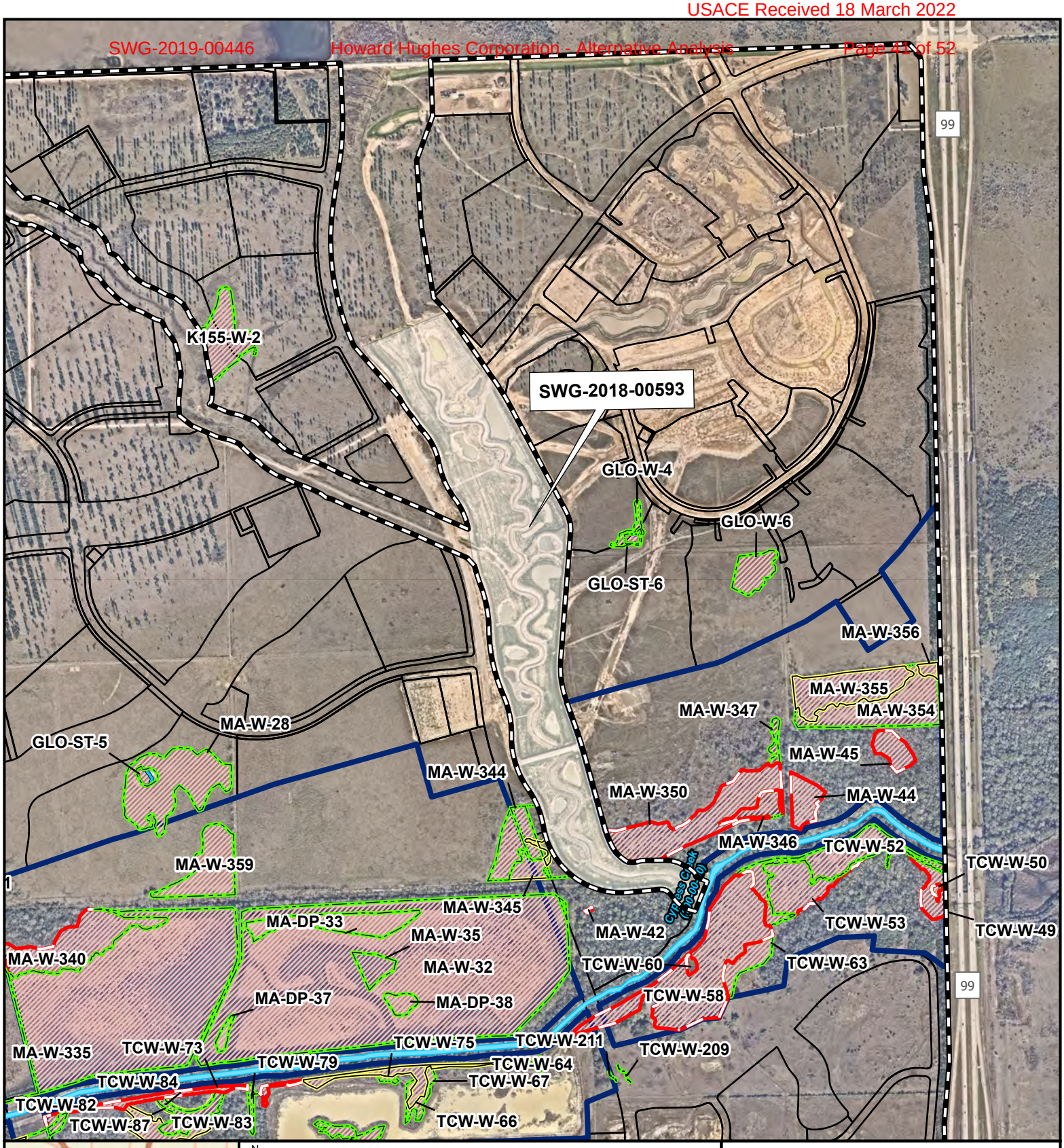

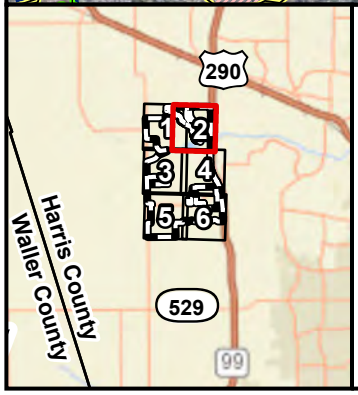

N

Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
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0 1,000 2,000 Feet

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SWG-2019-00446
Harris County, Texas
Sheet 2 of 6

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Job No.: 6286-00	Date: February 2022

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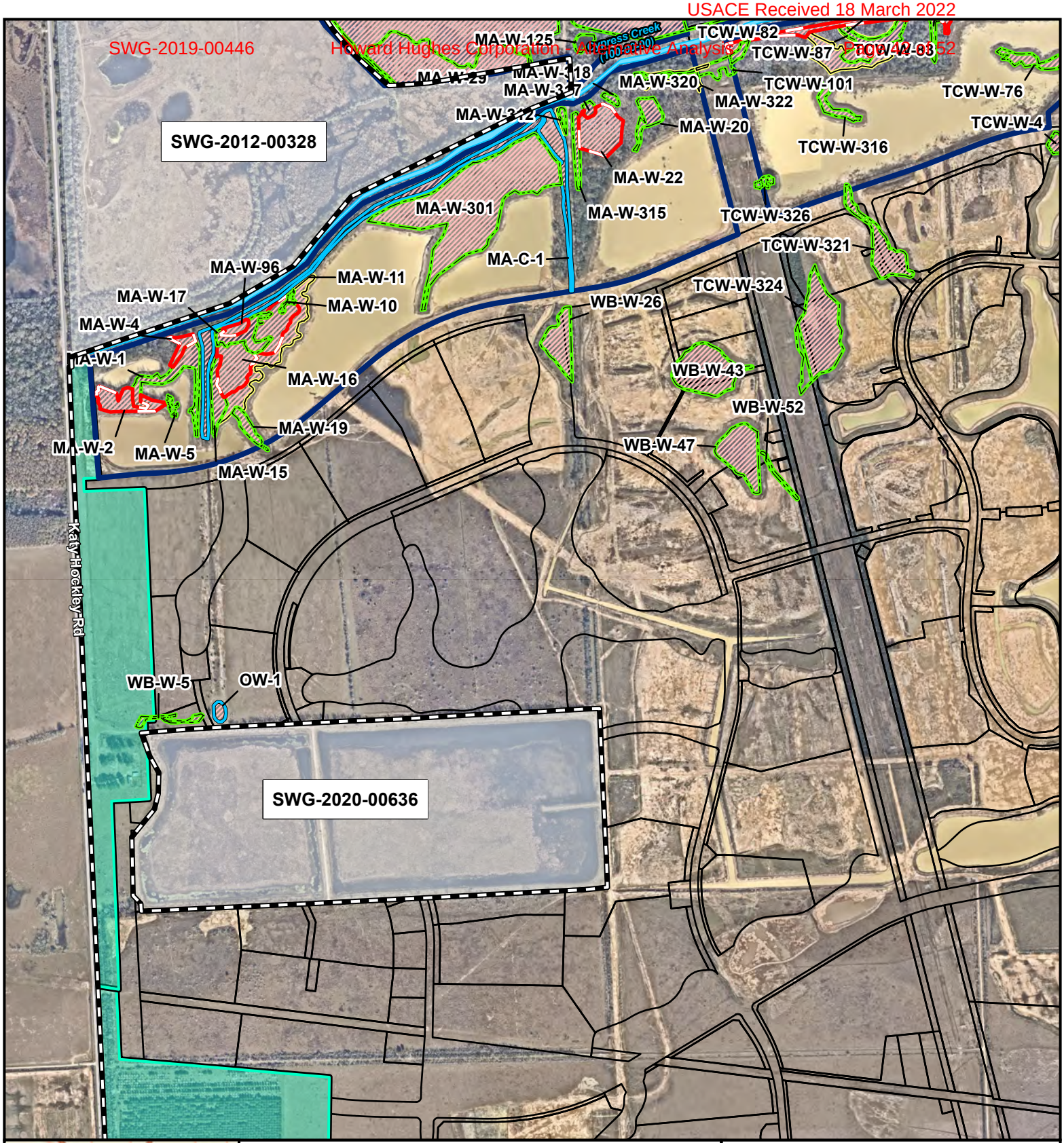

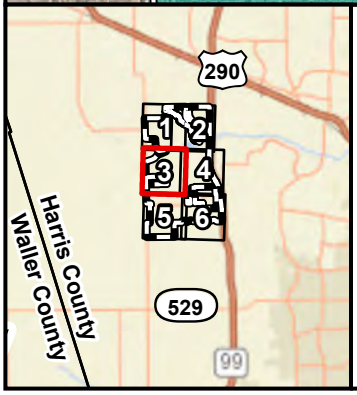

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

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Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 3 of 6

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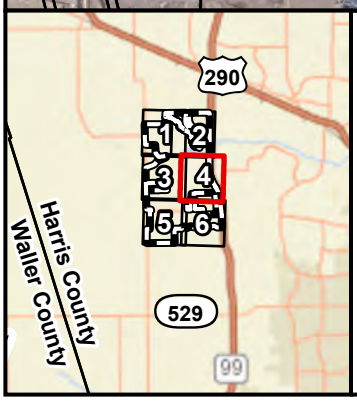

N

- Project Boundary
- Cypress Creek (K100-00-00)
- Bridgeland West Floodplain Mitigation Basin
- Overflow Area
- 2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
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4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 4 of 6

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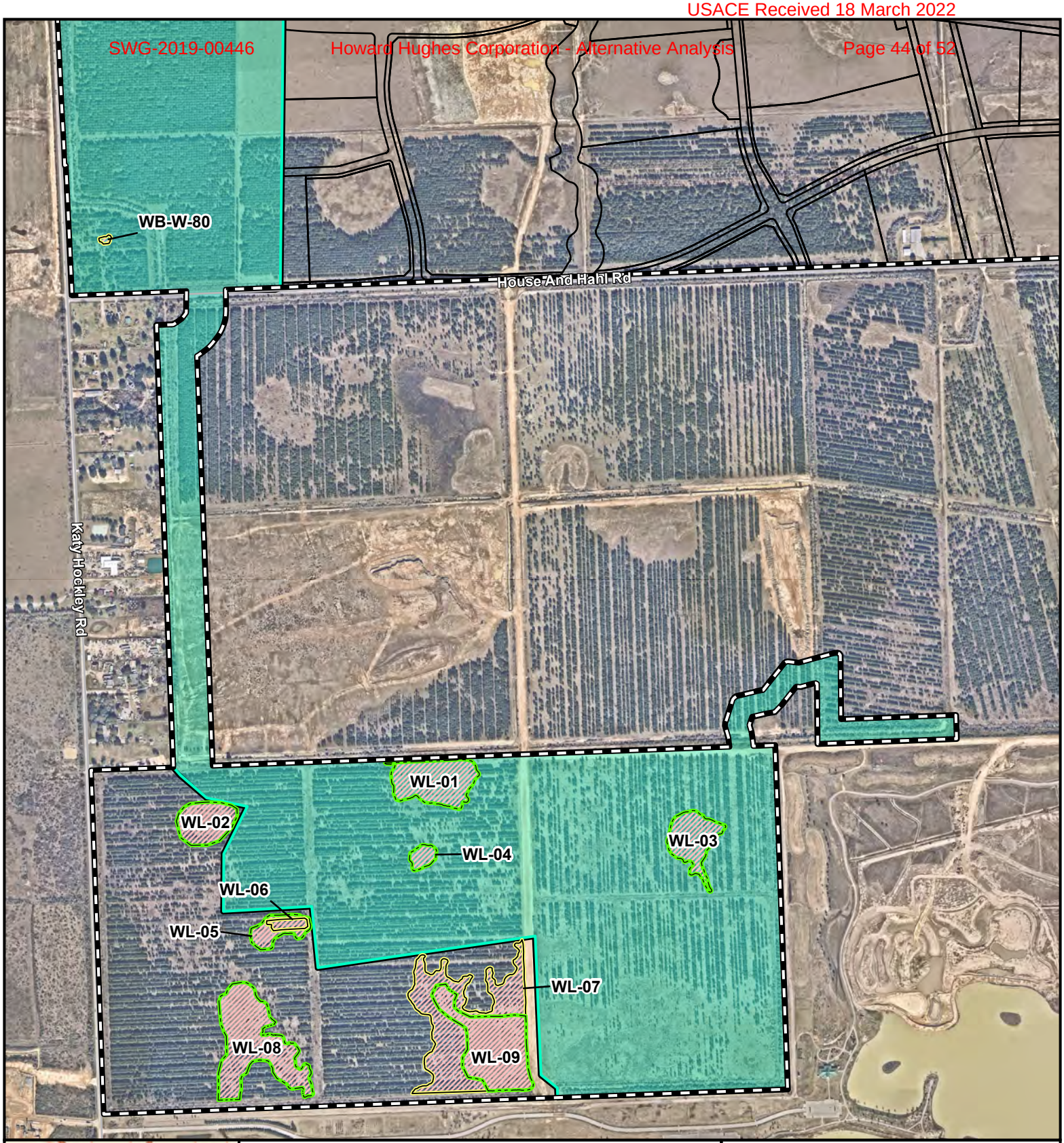

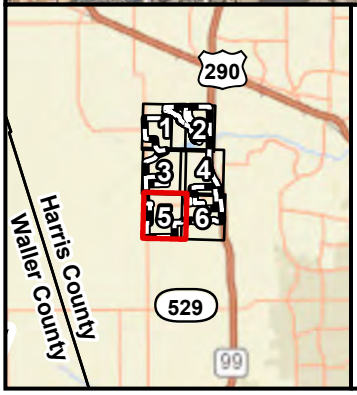

N

Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

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Exhibit 7
Onsite Alternative 1 Map
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 5 of 6

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Job No.: 6286-00	Date: February 2022

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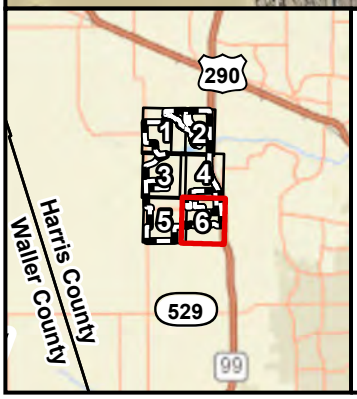

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

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4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
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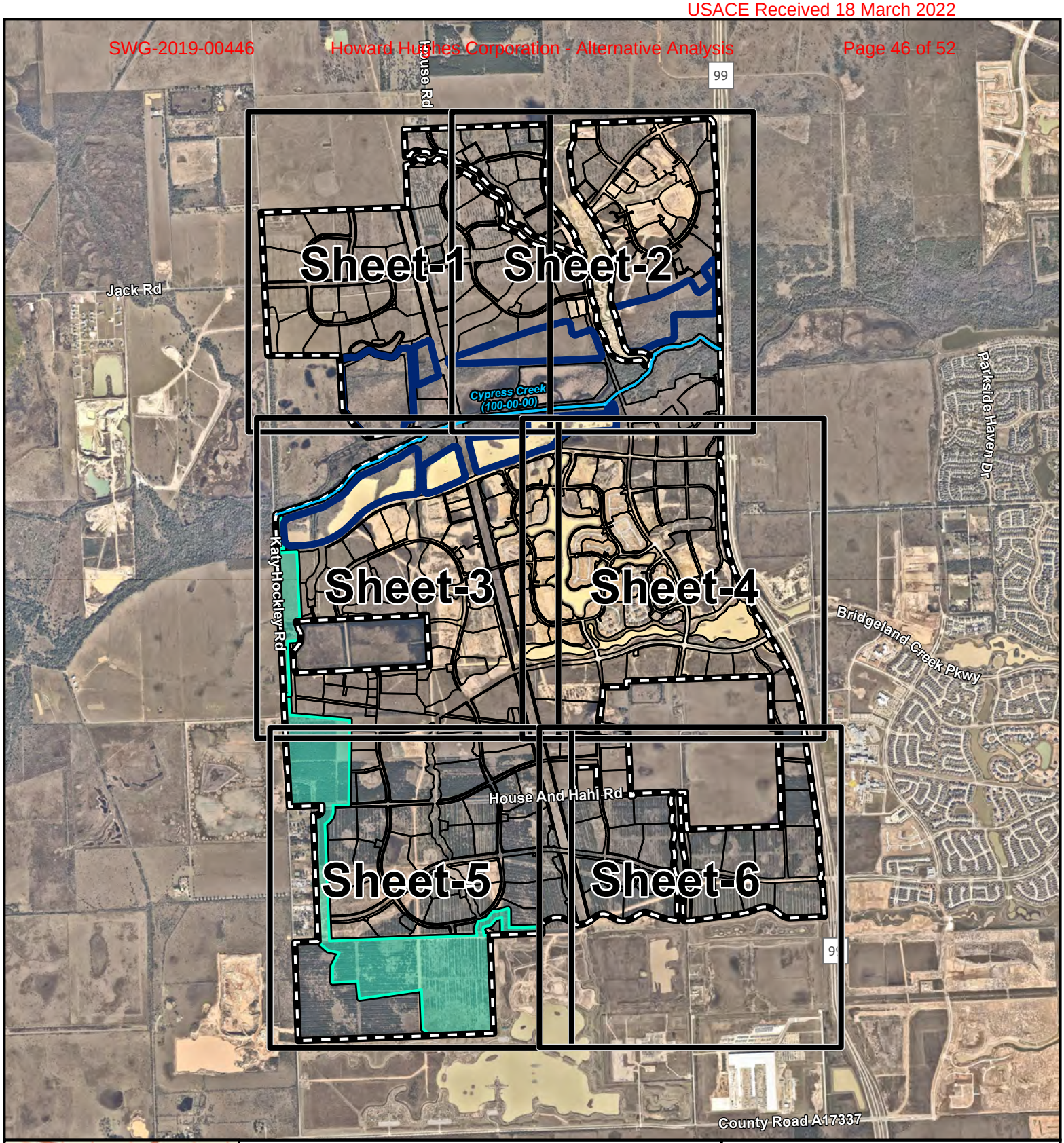

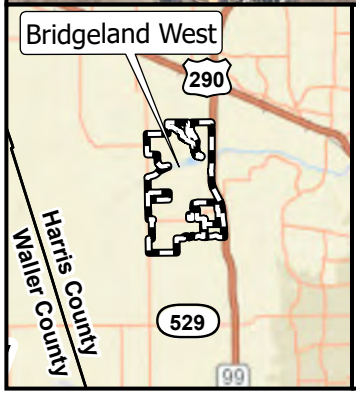

N

Datum: NAD 1983
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0 1,750 3,500 Feet

0 600 1,200 Meters

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Exhibit 8
Onsite Alternative 2 Map
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas

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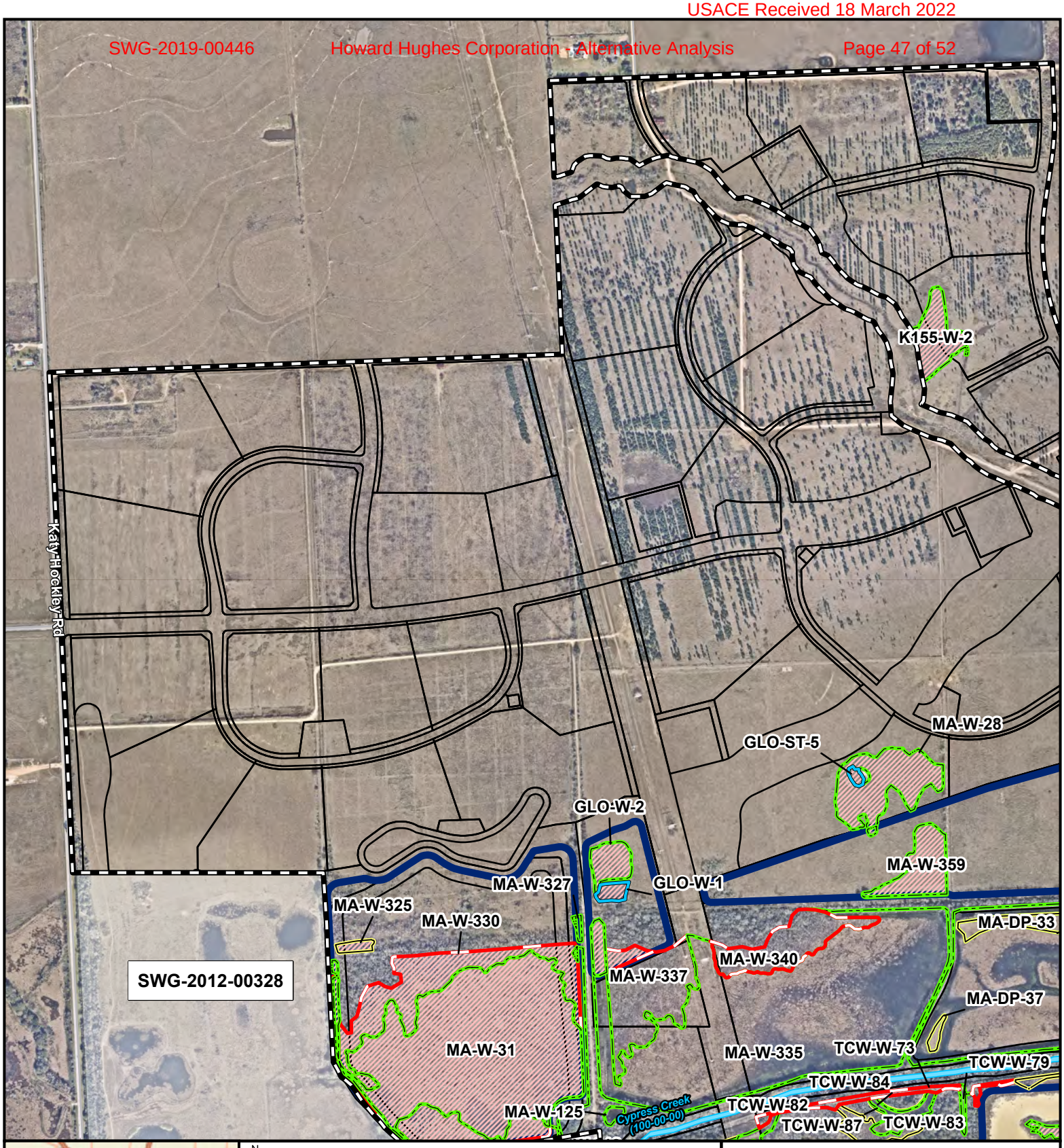

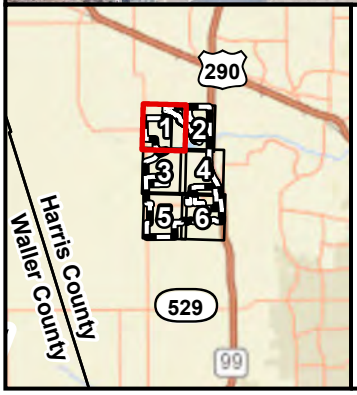

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

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0 1,000 2,000 Feet

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4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
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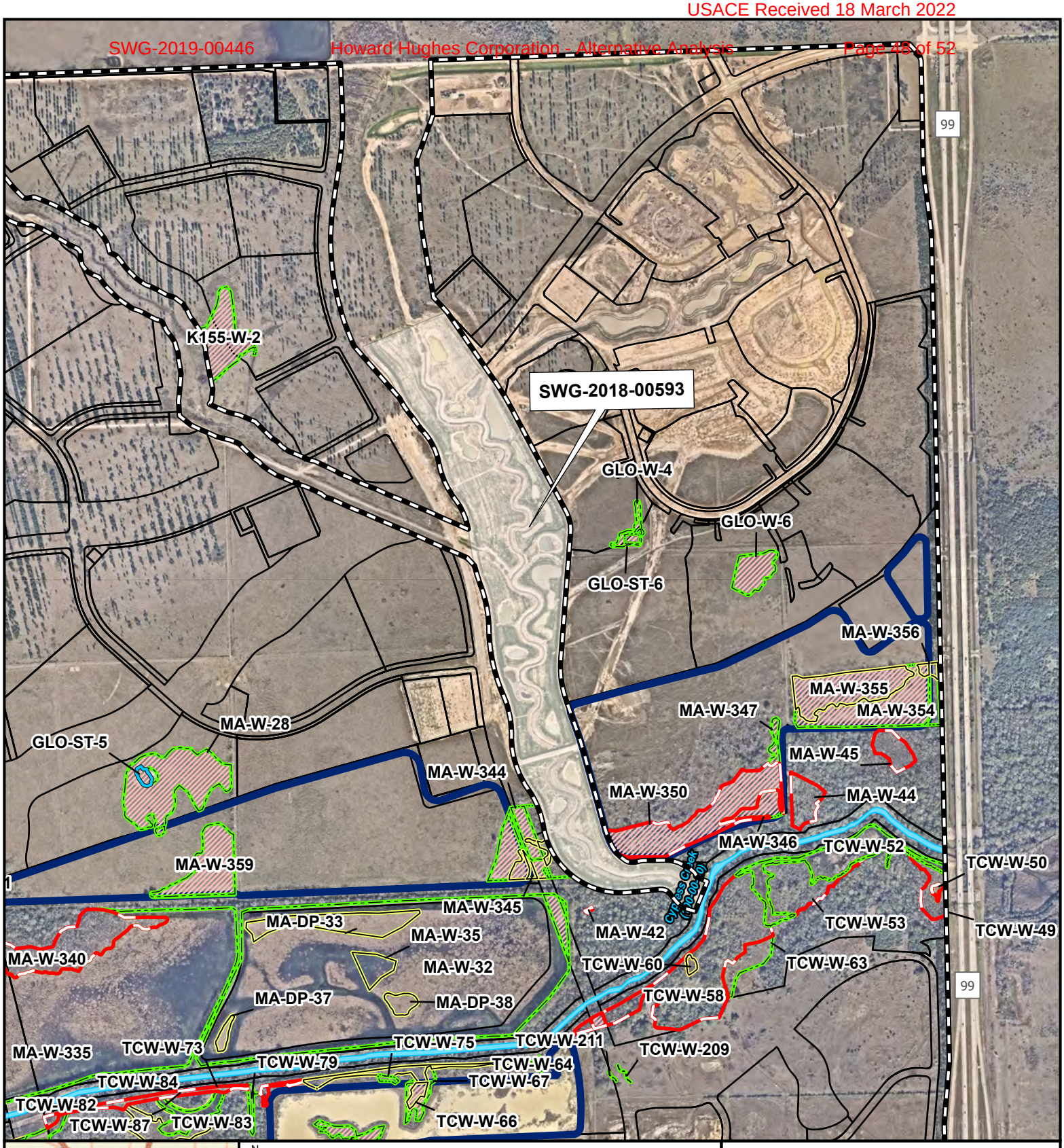

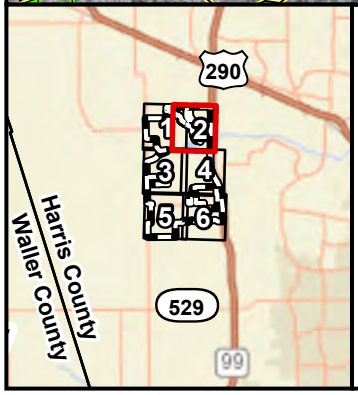

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
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2021 Landplan

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4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 2 of 6

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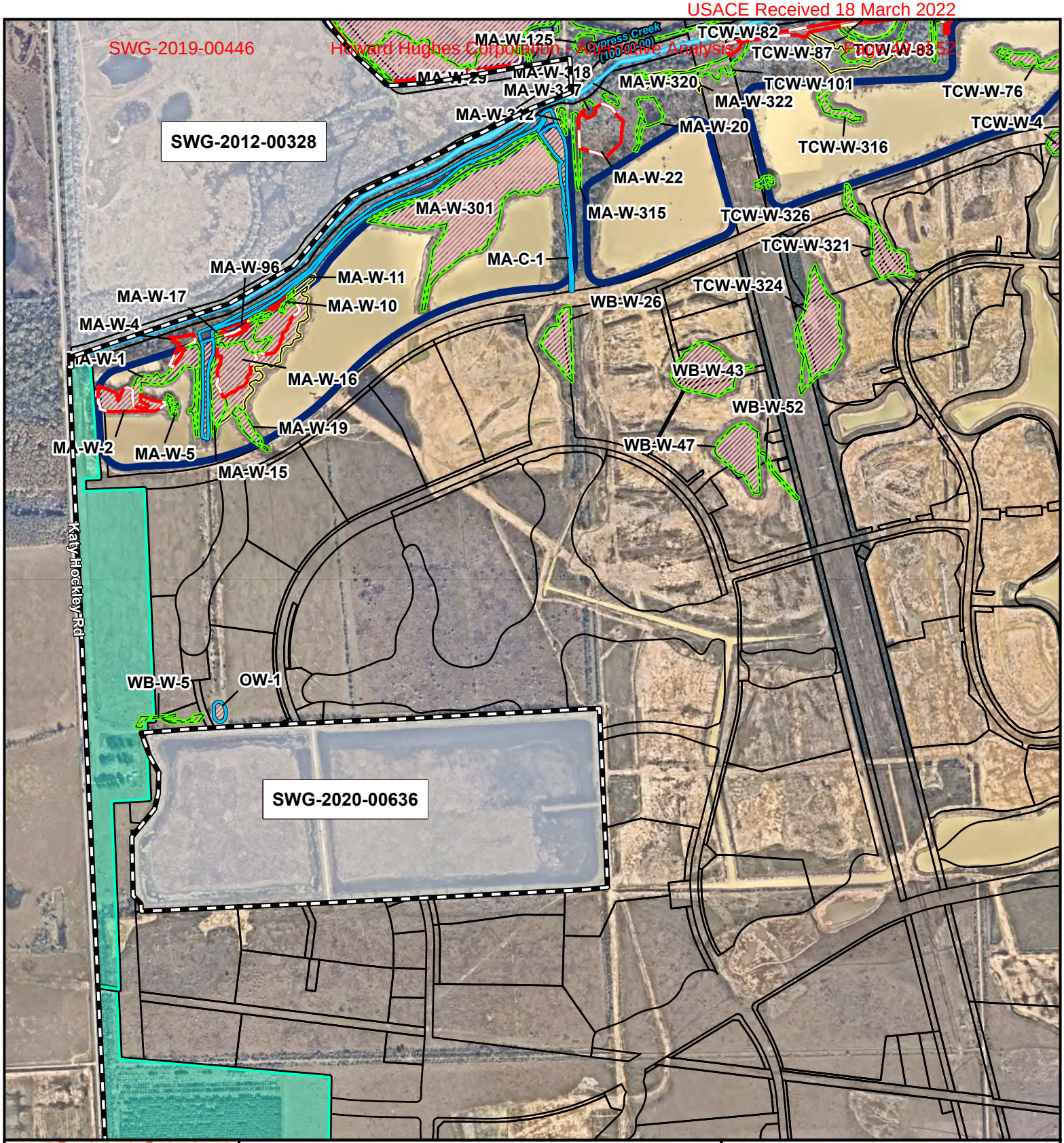
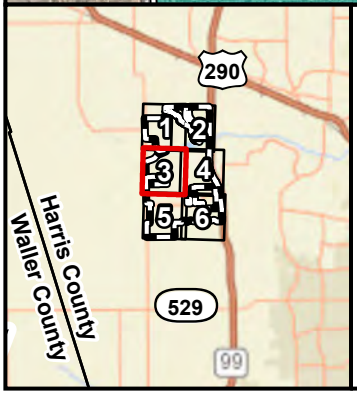
SWG-2019-00446 Howard Hughes Corporation Alternative Analysis Page 40 of 52





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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

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Job No.: 6286-00	Date: February 2022

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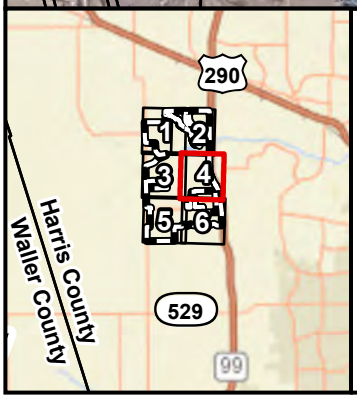

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Project Boundary
Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

Datum: NAD 1983
Projection: Texas State Plane
Zone: South Central
Units: Feet
Basemap: Nearmap (2021)

0 1,000 2,000 Feet

0 250 500 Meters

Wetland Classification

- Impact,PEM
- Impact,PFO1
- Impact,PSS
- Impact,PUBx
- Non-Impact,PEM
- Non-Impact,PFO1
- Non-Impact,PSS
- Non-Impact,PUBx

BGE, Inc.
10777 Westheimer, Suite 400, Houston TX 77042
Tel: 281-558-8700 Fax: 281-558-9701

Exhibit 8
Onsite Alternative 2 Map
Alternatives Analysis
Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 4 of 6

Prepared By: BGE	Scale: 1:12,000
Job No.: 6286-00	Date: February 2022

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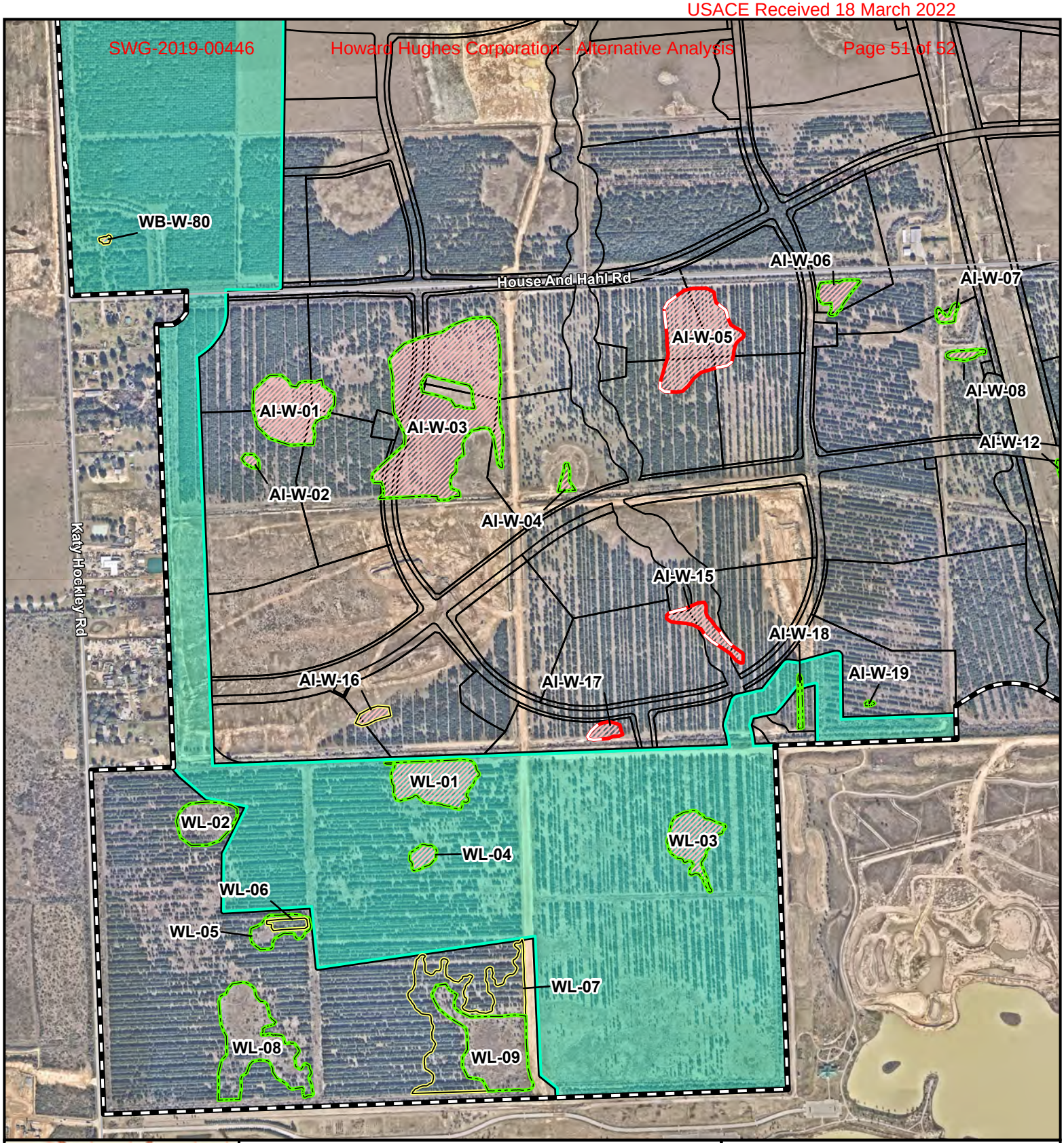

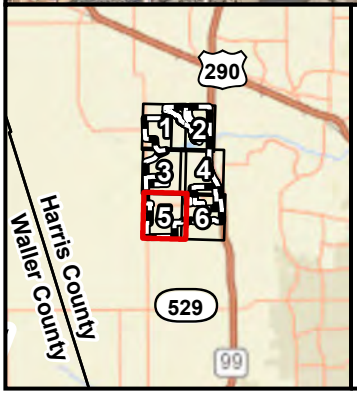

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Cypress Creek (K100-00-00)
Bridgeland West Floodplain Mitigation Basin
Overflow Area
2021 Landplan

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Bridgeland Management Development Company LLC
4,594-acre Bridgeland West Project
SWG-2019-00446
Harris County, Texas
Sheet 5 of 6

Prepared By: BGE	Scale: 1:12,000
Job No.: 6286-00	Date: February 2022

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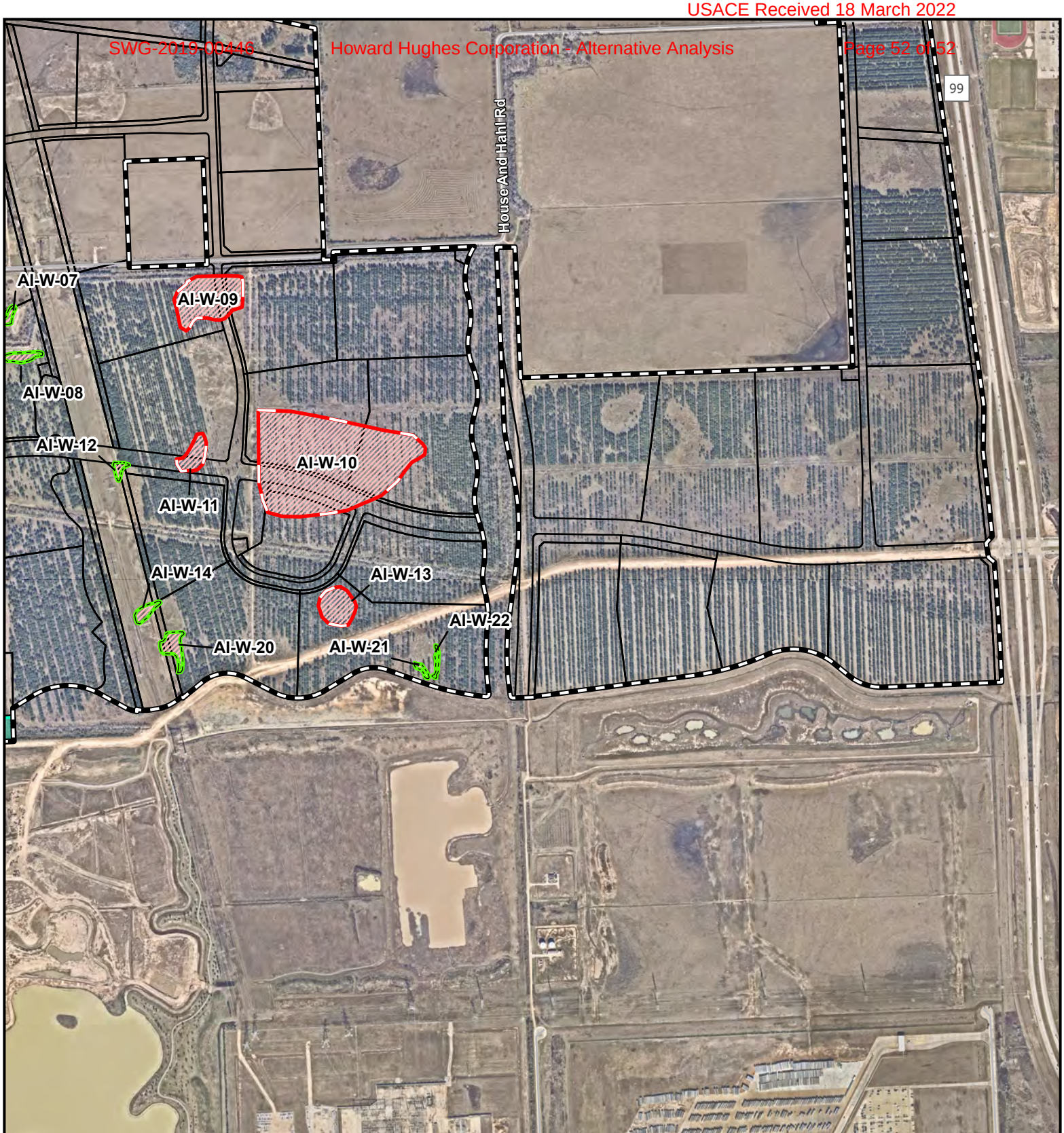

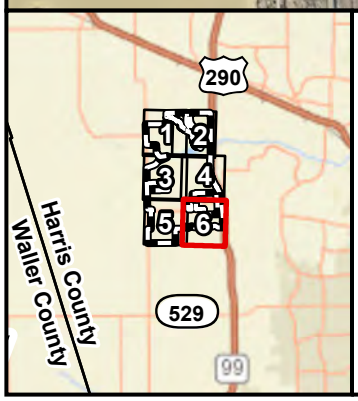

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Sheet 6 of 6

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