UNITED STATES DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION WASHINGTON, D.C.

IN THE MATTER OF COMPLIANCE WITH FEDERAL OBLIGATIONS BY CLOVER ACQUISITION CORPORATION, SPONSOR OF PEARLAND REGIONAL AIRPORT (LVJ), PEARLAND, TX

FAA Docket No. 16-22-06

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

Clover Acquisition Corp. ("Clover"), the Federal Grant Sponsor for Pearland Regional Airport (KLVJ), Pearland, Texas, provides the following as its response to the FAA's Notice of Investigation served on Clover in accordance with §16.101 and §16.103 on December 9, 2022,[1] Attached to this response are statements from Eric Lipper, an attorney licensed in the State of Texas on the issue of the drainage easement. Attorney Lipper provides this statement in support of Clover and The Landing at Pearland ("The Landing"), the residential development on non-federally obligated land that lies adjacent to KLVJ.[2] Also included with this response for inclusion in the record of this matter are various letters listed in Exhibit A, some which were referenced in the FAA's Notice of Investigation. Clover provides these documents to ensure the record reviewed by the FAA is complete as possible prior to issuing a Director's Decision.[3]

[1] The time within which Clover is required to provide a response was extended first through February 20, 2002, by Notice of Extension of Time dated January 20, 2023, and then through February 27, 2023, by email to Stephen D. Alexander, President of Cover Acquisition Corp (Sponsor of KLVJ) from the FAA's Office of Chief Counsel, AGC-610, dated February 16, 2023, and lastly through March 6, 2023, by email dated February 23, 2023 from the FAA's Office of Chief Counsel, AGC-610.

[2] By email to Stephen D. Alexander, President of Clover Acquisition Corp (Sponsor of KLVJ) from the FAA's Office of Chief Counsel, AGC-610, dated February 16, 2023, the FAA has permitted Clover to include a statement from The Landing.

[3] Clover asks that the documents referenced in the Notice of Investigation be included in the record if they are not already.

Clover addresses each of the issues under investigation after providing some additional background.

ADDITIONAL BACKGROUND

As the FAA noted in its Notice of Investigation (NOI), Pearland Regional Airport (KLVJ) is a privately owned, public use airport, within the State of Texas. As a privately owned airport, KLVJ does not have access to municipal, county, or State funds to meet the local match portion of Federal grants, administered within Texas by the Texas Department of Transportation (TxDOT) under a State Block Grant program. To meet the local match portion of Grants, TxDOT and KLVJ have agreed to a "land reimbursement" program to gain "sponsor credit" toward the local match portion of Grants. That land reimbursement program requires Clover to identify acreage that it owns not within airport property that Clover agrees to place under Federal obligation. TxDOT has left the job of identifying which acres have been so obligated to Clover. The NOI references a 2017 Airport Property Map (APM) that Clover has attempted to update. Clover provided an updated APM in 2022 but has not heard back from TxDOT. That updated APM is attached as Exhibit B and shows a total of 153.024 acres as Federal obligated, more than the 2017 APM. Based on TxDOT's reliance on Clover to identify just which parcels are Federally obligated and TxDOT's non-answer to Clover's attempt to update the APM, Clover reasonably relied on its own updated APM when it entered an agreement with The Landing to maintain the existing drainage areas on and off airport property.

Also, as a privately owned airport without access to municipal, county, or State funds, in order to remain in compliance with the requirement that the airport remain self-sustaining, KLVJ must find other revenue sources aside from ongoing ground leases and other operational revenue to meet the needs of capital projects needed on the airport. Clover, therefore, has looked to development of other land it owns in the vicinity of KLVJ to provide funding for capital projects. The area in the vicinity of KLVJ is low lying grassland and farmland. Over three-quarters of the Pearland community is residential and the population of the town grew nearly 150% in the ten years between the 2000 and 2010 census. The expense to build the necessary infrastructure to support commercial or retail development in the vicinity of the airport makes that kind development impractical. In addition, a number of other residential areas surround KLVJ making a residential development the only viable kind of use for Clover's off-airport land to fund the airport. Clover has sold other parcels of its land in the vicinity of KLVJ for use as residential developments with no adverse consequences to the operation of the airport. Accordingly, Clover entered an agreement with The Landing and retained an investment interest in the development great enough to influence how the development would be used in order to mitigate the potential hazards that come with residences near the airport.

Lastly, since the area is low lying, management of storm water runoff has always represented a major challenge to KLVJ. Long before Clover acquired the airport, and long before the airport received Federal Grants, through both FAA and now TxDOT, the area at issue served as water

drainage management for several parcels of land, both on and off airport property. As the NOI pointed out Brazoria Drainage District #4 ("DD4"), a State agency that oversees water management in the area, cited the airport's water management facilities as inadequate. DD4, however, knew that the airport already had a Master Drainage Plan in place, which DD4 had approved nine months earlier.[4] While the presence of any water drainage area is not optimal for any airport, Clover has tried to improve the conditions it inherited by improving the previously open and constantly wet drainage swale on Federally obligated property, turning it into a dry drainage management area. It did so through the agreement it made with The Landing. Clover benefited from over $2,000,000 of improvements and maintenance to that area and all other drainage ditches and on the airport. The airport is better and arguably safer with the improved drainage area, which may not present the same hazard that the NTSB noted with drainage ditch on the other side of the runway. See, NTSB Report CEN21FA239 in Exhibit A.

THE LANDING AS A COMPATIBLE LAND USE

The major issue contained in the Notice of Investigation appears to be the use of non-Federally obligated property lying adjacent to the airport for a residential development. The NOI points to the Grant Assurance contained in 49 USC 47107(a)(10) that provides that an airport sponsor will take "appropriate action, including the adoption of zoning laws, ... to the extent reasonable to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations." The statute does not define the term "compatible." The FAA, however, has gone to great lengths to establish a policy that all residential uses, regardless of circumstances, are not compatible with airport operations. A policy, however, cannot amend the statute. The FAA cannot prohibit all residential development, only require airport sponsors to, as the statute commands, take reasonable actions to restrict such development so that it does not interfere with normal airport operations. Understandably, the FAA would not desire airport sponsors to take actions that result in a residential development next to an airport that in the future could lead to that same airport seeking grant money to mitigate an airport noise issue at that same development. That is not the situation at Pearland.

The land surrounding KLVJ is best suited for residential development, rather than commercial or retail uses. There are many tracts of land near and adjacent to the airport that currently support manufactured home developments. The nature of the soil and the historic use of the land as a storm water runoff area for other parts of the community make building the infrastructure to support commercial or retail development economically impractical. The tract of land on which The Landing was developed was, as early as the 2017 APM, identified as the location of a potential residential subdivision on the Airport Property Map. That 2017 APM, approved by

[4] Clover expects that TxDOT was also aware of DD4's approval of the airport's Master Drainage Plan as TxDOT had earlier sponsored a drainage study that resulted in that Master Drainage Plan.

TxDOT, shows the property on which The Landing was developed as the "West Friendswood Subdivision." Therefore, from at least 2017 TxDOT and the FAA were aware that this area was potentially developable as a residential.

As a privately owned airport, Clover has no authority to institute zoning changes that could restrict the use of the off-airport, non-Federally obligated land. As a responsible airport sponsor, however, Clover took, in the words of §47107(a)(10), reasonable actions to restrict such development so that it does not interfere with normal airport operations. First, Clover retained a 20% interest in The Landing, giving it leverage with which to insist on use restrictions for the residents of The Landing. Exhibit C shows those restrictions that apply to the lessees of The Landing that addresses this issue. Thus, the development provides Clover with a steady revenue stream that Clover can use to maintain the economic sustainability of the airport while reasonably ensuring that the development does not interfere with normal airport operations. Second, Clover ensured that the business model of The Landing allows for enforcement of those use restrictions. The Landing is not the typical subdivision with individual plots of land owned in fee by those who reside there. The Landing leases plots of land to owners of manufactured homes and can, therefore, enforce any use restriction made part of the ground lease by, ultimately, terminating the lease. And, third, Clover ensured that the final heights of structures in The Landing do not penetrate any of the imaginary surfaces associated with a general aviation airport, such as KLVJ. Attached as Exhibit D is correspondence from the FAA regarding Obstruction Evaluations that conclude that The Landing does not present a hazard to airport operations.

Specifically, the FAA's concerns with residential development in the vicinity of an airport appear to primarily relate to noise, but also include wildlife attraction, height restrictions, and light and radio interference. The structure of The Landing's leases addresses these various potential land use concerns. In terms of noise concerns, the present noise levels are not likely to change. KJLV serves a small general aviation fleet of aircraft. Because of its location close to Hobby Houston and configuration of the single runway the prospect of scheduled service or the development of cargo or charter operations is extremely unlikely. Even if future Advanced Air Mobility (AAM) aircraft start using the airport, those aircraft will be operating with power plants that generate less noise (typically electric) than the current internal combustion or gas turbine power plants in aircraft today. Also, the Landing is located to the side of the runway, an area that typically experiences the least off airport noise compared to the approach and departure corridors extended from the ends of the runway. Therefore, Clover believes that none of the residence locations at The Landing will experience noise levels above that which the FAA views as "significant," i.e. 65 DNL. Indeed, The Landing's proximity to the airport has attracted an aeronautical user to the airport. Attached as Exhibit E is a letter from Odyssey Pilot Hours stating in part that the presence of The Landing at Pearland served as an integral part of its decision to locate at the airport. Accordingly, Clover managed to do more than a municipal airport sponsor could do to restrict the use of land adjacent to the airport through zoning changes and ensure that the development of the land adjacent to the airport does not interfere with normal airport operations. Therefore, since Clover has taken reasonable actions to keep The Landing from interfering with normal airport use and has complied with the §47107(a)(10, the Landing should be deemed to be a compatible land use.

THE AIRPORT LAYOUT PLAN

The Notice of Investigation alleges that Clover made changes to the airport that are not on the Airport Layout Plan. This is factually incorrect. This allegation stems from a misconception that the improvements to the area historically used for drainage for the airport and surrounding areas constituted an expansion of that area or a change in use of that area. This on-airport area was always used for the purpose of water runoff and is still used for that purpose. The potential confusion might stem from photos taken before the development of The Landing showing in that area of the airport to contain only a small, open ditch. Section 10 of the Master Drainage Plan, approved by DD4, shows the conditions before the improvements made to the drainage area in terms of wildlife hazards. Clover, in cooperation with The Landing, improved that small, open ditch into a more robust drainage management area, as laid out in the Master Draining Plan and approved by DD4. The improved area is now a dry area less likely to attract water fowl and other wildlife, and complies with DD4's requirements to service the historic drainage basin in the vicinity of the airport. The area on which the improved drainage area now exists was not usable for any aeronautical purpose prior to the improvements. Therefore, there has been no change of use of any airport land contrary to the Airport Layout Plan or the Airport Property Map. Clover attempted to update the Airport Property Map with TxDOT in 2022, but TxDOT has not yet responded. The FAA and TxDOT both placed on Clover the burden of identifying the acreage used for the local match portion of grants KLVJ. Since Clover bore that burden, Clover reasonable relied on the updated map as the current map for purposes of improving the drainage area. The Airport Property Map has always shown on the map the area used for drainage and that use has not changed. Therefore, there has been no change of use of airport property and, accordingly, Clover is in compliance with its Grant Assurances with regard to the Airport Layout Plan.

THE DRAINAGE EASEMENT

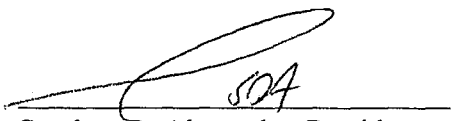
The Notice of Investigation alleges that Clover expanded a drainage basin on KLVJ and disposed of a property interest without FAA prior approval. This is factually incorrect. The area at KLVJ that lies to the east of the single runway at the airport, starting at mid-field and extending southward approximately 1500 feet and eastward about 750 feet to form a triangular shaped parcel of land is identified as "Lot 2" in the attached Drainage Easement and Maintenance Agreement (Exhibit F). That land has for decades served as storm water drainage for not only the airport but also many surrounding parcels. Attached as Exhibit G is a statement from Eric Lipper, an attorney licensed in the State of Texas and knowledgeable in Texas real estate law. Mr. Lipper has explained that under Texas law an easement to drain water over that land historically existed and survived Clover's transfer of the property to The Landing. At least as recently as DD4's approval of the airport's Master Drainage Plan, Clover could not have stopped The Landing from using that parcel for water drainage management. Therefore, when Clover entered into the Drainage Easement and Maintenance Agreement with The Landing, it did not

convey any interest in the on-airport land. That on-airport land was already encumbered by a drainage easement and Clover could not prevent The Landing from using that land for drainage management. The agreement with The Landing provides, to the airport's benefit, that The Landing will improve the area on the airport already encumbered for drainage management so that it can support future on airport development and maintain all of the airport's drainage management ditches, culverts, and swales. Accordingly, Clover did not dispose of any land rights by entering the Drainage Easement and Maintenance Agreement with The Landing. Since Clover did not dispose of any airport land rights, no FAA release of Grant Assurance obligations was required.

The land in question remains available for its primary aeronautical purpose, to support the airport and its operations by serving as storm water management. The airport did not relinquish any value by entering into the agreement with The Landing. Quite the opposite, the airport gained value by having The Landing improve the area to accommodate storm water runoff more efficiently. The area that was once an open, wet swale became an efficient dry (except for times of high runoff) area. The area no longer represents a potential wildlife habitat reducing the risk to aircraft using the airport. And, since Clover retains a financial interest in The Landing, as described above, this area is now part of a revenue stream for the airport. "If aeronautical land is to remain in use for its primary aeronautical purpose but also be used for a compatible revenue-producing non-aeronautical purpose, no formal release request is required." See, FAA Order 5190.6B, Change 2, dated 12/9/2022, ¶22.5.

CONCLUSION

Therefore, after considering all the facts and circumstances relevant to this investigation, Clover asks the FAA to find that Clover Acquisition Corp., as the Federal Grant Sponsor for Pearland Regional Airport (KLVJ), has met all its Federal Grant Assurances and is in compliance with all applicable obligations.



Stephen D. Alexander, President
Clover Acquisition Corporation
Sponsor, Pearland Regional Airport, Pearland, Texas

Dated: March 6, 2023

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that I have this day served the foregoing Sponsor's Response to Notice of Investigation on the following persons at the following addresses by email in accordance with §16.13(h), except for Exhibits A, B and D of the Sponsor's Response.

Exhibits A, B and D of the Sponsor's Response have, on this day, been served by overnight delivery to the following in accordance with §16.13(b) due to their large electronic file size.

Mr. Stephen D. Alexander
President, Clover Acquisition
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Mr. Kevin C. Willis, Director
FAA Office of Airport Compliance and Management Analysis (ACO-100)
800 Independence Avenue, S.W.
Washington, DC 20591
Kevin.Willis@faa.gov

FAA Part 16 Airport Proceedings Docket (AGC-600)
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, DC 20591
9-AWA-AGC-Part-16@faa.gov

Christopher Poreda
Attorney

Dated this 6th day of March, 2023.

FAA Docket 16-22-06

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

EXHIBIT A

Additional documents to be included in the Record[1]:

1. Airport property map (APM) dated 2017 (Exhibit B)
2. Pearland Regional Airport Master Drainage Plan dated 2021
3. Proposed airport property map, submitted to TxDOT in 2022 (Exhibit B)
4. Airport development layout showing The Landing, dated 9/1/2022
5. Drainage Easement and Maintenance Agreement, dated May 10, 2022 (Exhibit F)
6. Letter from Clover to Frank Snell, dated 8/18/2022, re: OE Study
7. Letter from KSA to Clover, dated 8/19/2022, re: OE Study
8. NTSB Accident Report on fatal accident at Pearland, dated 12/7/2022
9. Letter from Odyssey Pilot Hours to Clover, dated 2/20/2023 (Exhibit E)
10. Determinations of No Hazard from FAA Obstruction Evaluations, dated 2/27/2023 (Exhibit D)[2]

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[1] These documents are either attached as part of Exhibit A or, as noted, attached as other exhibits.

[2] The FAA conducted five separate aeronautical studies for The Landing, the homes, the clubhouse, the maintenance building, the pavilion, and the water treatment plant. Provided here are determinations for home points 5, 6, and 7 (the closest points to the runway at KLVJ) as identified in the Overview on the final page of the attachment. Also, to reduce the electronic size of the filing, while each of the determinations are 5 pages in length, only the determination for point 5 is included in its entirety. For points 6 and 7 only the first two pages are included. Pages 3 through 5 of each determination are similar – Page 3 is an overview of the five obstruction evaluation cases, page 4 is a topographical map showing the location of the point in question, and page 5 is a portion of the VFR sectional chart showing the point in question. Clover views the topographical map and sectional for each point is unnecessarily redundant.

8/26/2021

STATE OF TEXAS
CHRISTOPHER J. WILDE
111787
LICENSED
PROFESSIONAL ENGINEER

Christopher J Wilde

Pearland
Regional Airport

AIRPORT MASTER DRAINAGE PLAN

TxDOT Project ID. 2012CLOVE

KSA Project No. TAP.006

May 2021

Prepared by:

KSA

4833 Spicewood Springs Road, Suite 204
Austin, TX 78759
512.342.6868
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TBPE Firm Registration No. F-1356

Approved. September 14, 2021
BRAZORIA DRAINAGE DISTRICT 4

Owner Information:
Texas Aviation Partners
Contact: Stephen Alexander
4400 Airport Highway 21
San Marcos, Texas 78666
512-216-6042

PEARLAND REGIONAL AIRPORT

MASTER DRAINAGE PLAN

Pearland, Texas

Approved, September 14, 2021

BRAZORIA DRAINAGE DISTRICT
4

APPROVED BY THE BOARD OF COMMISSIONERS ON SEP 14 2021

Brazoria Drainage District No. 4

District Engineer

The above have signed these plans and/or plat based on the recommendation of the DISTRICT'S Engineer who has reviewed all sheets provided and found them to be in general compliance with the DISTRICT'S "Rules, Regulations, and Guidelines". This approval is only valid for three hundred sixty-five (365) calendar days. After that time re-approval is required. Please note, this does not necessarily mean that all the calculations provided in these plans and/or plats have been completely checked and verified. In the event of any conflict or inconsistency between the DISTRICT'S "Rules, Regulations and Guidelines" and these approved drainage plans and/ or plat, the DISTRICT'S "Rules, Regulations & Guidelines" shall govern and prevail. Any approved variances shall be itemized on the cover sheet and placed on the appropriate sheet where applicable. Plans submitted have been prepared, signed and sealed by a Professional Engineer licensed to practice engineering in the State of Texas and plat has been signed and sealed by a Registered Professional Land Surveyor licensed to practice in the State of Texas, which conveys the engineer's and/or surveyor's responsibility and accountability.

BDD4 Ref. ID #: 2119

Project Name: Pearland Regional Airport Master Drainage Plan

Date of Issue: 5-26-2021

NOTE: This Signature Block is for Final Drainage Plan and Final Plats only. The Signature Block shall include the notes shown above. For Final Drainage Plans, please put the Signature Block on the cover sheet only.

Approved. September 14, 2021

BRAZORIA DRAINAGE DISTRICT 4

Table of Contents

List of Tables

List of Exhibits

List of Equations

List of Figures

List of Appendices

1.0 INTRODUCTION

The management of storm water is of critical importance in an airport environment and particularly for development in the Gulf Coast region. The proper planning and design of drainage facilities serves many benefits including the protection of life and property on the airport from flooding and storm water damage, enabling development on the airport without negative impacts to downstream properties and waterways, and minimizing the safety hazards to aircraft from wildlife.

This Airport Master Drainage Plan will serve as a guide for planning and designing drainage infrastructure to accommodate future development on Pearland Regional Airport (Airport) property and reduce wildlife hazards in accordance with local and Federal regulations. The primary purpose of this drainage study is to evaluate detention options to mitigate additional runoff created by the anticipated future development and provide recommendations for detention and drainage improvements. Additional items considered in this drainage study include known localized drainage issues and wildlife hazard mitigation as it relates to on-Airport drainage facilities.

KSA Engineers, Inc., prepared the hydrologic analysis based on the Natural Resource Conservation Service (NRCS) *Urban Hydrology for Small Watersheds* TR-55 dated June 1986 and the Federal Aviation Administration's (FAA) Advisory Circular (AC) 150/5320-5D dated 2/26/2014. KSA used the SCS (Soil Conservation Service) method to calculate the amount of runoff from the Airport for each storm event. The hydrologic parameters were analyzed in ESRI's Geographic Information Systems (GIS) and AutoCAD (CAD). The parameters were input into the US Army Corps of Engineer's Hydrologic Modeling System (HEC-HMS) Version 4.2.1 to calculate runoff and size sufficient detention to mitigate additional flows.

2.0 PROJECT DESCRIPTION

Pearland Regional Airport is situated on approximately 450 acres of property between the jurisdictional boundaries of the Cities of Pearland, Friendswood, and Alvin. The Airport lies within the City of Pearland's extraterritorial jurisdiction (ETJ). As depicted on **Exhibit 1**, the Airport is generally bound by County Road 127 to the northeast, County Road 130 to the southeast, and Cowart Creek to the west.

In ultimate buildout conditions, the Airport will develop approximately 144 acres that will potentially consist of buildings, vehicle roads, vehicle parking, aircraft apron, taxiways, runway extensions, office space, and residential development. The resulting additional flows due to an increase in impervious cover will be mitigated by detention. This study presents detention recommendations to mitigate future flows for an interim development and ultimate buildout conditions.

The Airport is located within the jurisdiction of the Brazoria Drainage District No. 4 (BDD#4). The Airport is located in Brazoria County on the "effective" FIRM Panel 48039C0065K, revised December 30, 2020. The City of Pearland has adopted this FIRM Panel developed from Atlas-14.

The results of Atlas-14 generally expand the regulatory floodplain. BDD#4 is deciding whether to adopt Atlas-14 or not. Significant changes in their regulatory floodplain for the area around Pearland Regional Airport are unlikely within a 0-10 year planning and development window. KSA recommends adopting the results developed in the most recent effective FIRM panel adopted by the City of Pearland in order to "future-proof" this drainage study document so the study remains valid for the longest duration practical for development approval purposes. It is our understanding that BDD#4 is amendable to recommendation. The effective 100-year floodplain for Cowart Creek encroaches onto Airport property between 50 and 500 feet, particularly in the south and southwest portions of the airport property as shown in **Exhibit 2**. The areas within the floodplain along the southwest side of the airport boundary are likely not suitable for development without costly improvements to the Creek's floodplain and the lengthy process of revising the FEMA floodplain boundary. These areas could potentially provide additional detention near the creek.

The limits of the Zone AE Floodway of Cowart Creek run along the south and southwest portions of the airport property. No development is anticipated within the floodway. The detention analysis presented in this report provides a mitigation plan for discharge generated from proposed development within the airport to be less than or equal to the current discharge from the airport into the Cowart Creek floodway.

3.0 STORM WATER DESIGN REQUIREMENTS

The Brazoria Drainage District #4 *Rules, Regulations & Guidelines*, dated May 1, 2013, requires a minimum detention of 0.65-acre feet per acre of the project area to temporarily store excess runoff caused by the addition of impervious cover. Detention is designed to reduce the post-development peak storm water discharge to less than the pre-development peak storm water discharge for regulated storm events. In accordance with BDD#4 regulatory criteria, on-site detention shall be designed to detain any runoff in excess of the pre-development 3, 10, and 100-year storm events. The side slopes of the proposed ponds shall be 4:1 or flatter.

The FAA AC 150/5320-5D, *Airport Drainage Design*, governs for Federal regulations relating to drainage on the Airport, and it states that the fundamental objective of storm water management is to maintain the peak runoff rate from a developing area at or below the pre-development rate to control flooding. FAA recommends that a 5-year storm event not encroach the pavement of a taxiway or runway and that the center 50 percent of the runway or taxiway should be free from ponding that results from a 10-year storm event. Drainage infrastructure should be designed to pass a storm event within 48 hours.

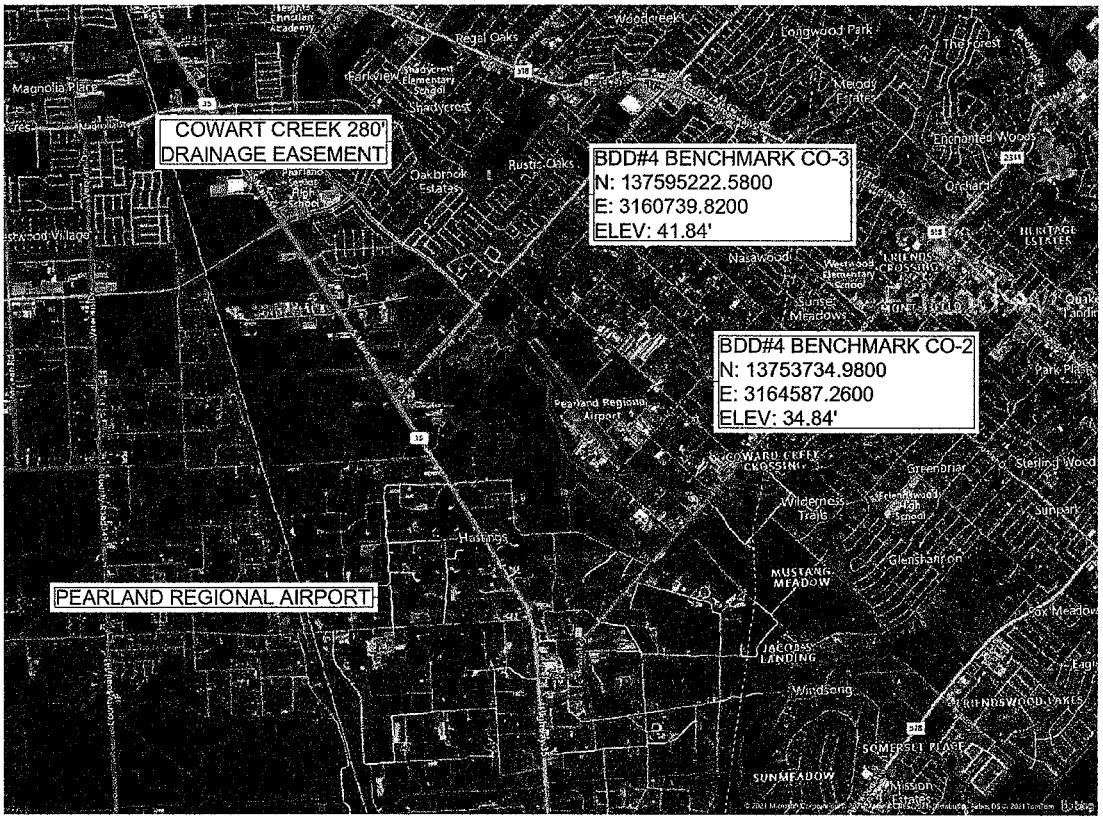


EXHIBIT 1
LOCATION MAP

PEARLAND REGIONAL
AIRPORT MASTER
DRAINAGE PLAN

KSA

Approved: September 14, 2021

1

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross-sections and interpolated between cross-sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas are in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Texas State Plane South Central Zone (FIPS zone 4204). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or State Plane zone used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referred to North American Vertical Datum of 1988. These flood elevations must be converted to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. These data files were provided in digital format by Texas Natural Resources Information Systems (TNRIS) (lakes), National Oceanic and Atmospheric Administration (NOAA), National Geodetic Survey (NGS), Veasey Drainage District, and the Brazoria County Appraisal District.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which incorporates authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

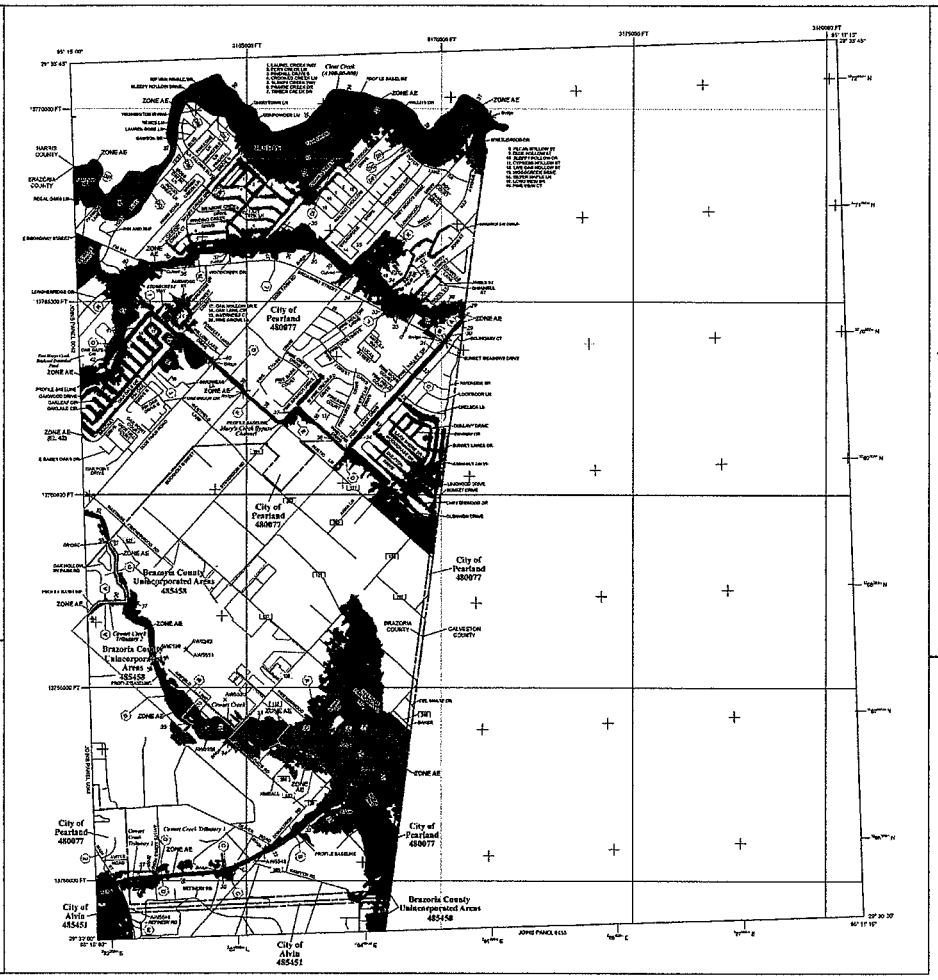
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community office to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program (NFIP) participation dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the Map Service Center (MSC) website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have questions about this map, how to order products or the National Flood Insurance Program in general, please call the Flood Mapping and Insurance eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/fhm/ex_main.shtm.

AIRPORT PROPERTY BOUNDARY



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Areas are the areas subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet* (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
- (A) — Cross section line
- 97°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 mN — 1000-meter Universal Transverse Mercator grid values, zone 15N
- 600000 mE — 1000-foot grid values, Texas State Plane coordinate system, South Central Zone (FIPS ZONE 4204), Lambert Conformal Conic projection
- DX5510 — Bench mark (see explanation in Zone D section of this FIRM panel)
- M1.5 — River Mile

*Referenced to the North American Vertical Datum of 1988

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

MAP EFFECTIVE DATE
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
March 4, 1991
September 27, 1991
September 30, 1992
December 26, 2020

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

PANEL 0065K

FIRM
FLOOD INSURANCE RATE MAP

BRAZORIA COUNTY, TEXAS AND INCORPORATED AREAS

PANEL 65 OF 525

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BRAZORIA COUNTY	480077	0065	K
PEARLAND, CITY OF	480077	0065	K

Notice to User: The Map Number shown below should be used when ordering flood insurance. Communities participating in the National Flood Insurance Program (NFIP) have been designated as indicated above.

MAP NUMBER
48039C0065K

MAP REVISED
DECEMBER 26, 2020

Federal Emergency Management Agency

Revised September 14, 2021

EXHIBIT 2
FLOODPLAIN MAP

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

DRAWN BY: TC
DESIGNED BY: TC
CHECKED BY: JM
APPROVED BY: MM
DATE: 9/14/2021
PROJECT NO.: TAP206

SHEET NO.
2

4.0 EXISTING CONDITIONS

This section provides an explanation of the methodologies used for the hydrologic analysis of the existing land use.

4.1 Drainage Area Delineation

Sub-basins were delineated using 0.25-foot contours that were generated from a geodatabase provided by the City of Pearland. Drainage patterns in areas were the topography does not clearly delineate drainage basins were determined using on-site and aerial imagery. Storm water runoff on the Airport flows to two general locations: portions of runoff travel to the runway infield existing detention areas via drainage channels and area inlets and other portions of runoff travel offsite to roadside ditches along FM 124 and FM 130. Ultimately, all storm water runoff from the Airport travels to Cowart Creek. The drainage patterns and existing sub-basins are provided on **Exhibit 3**. **Table 1** provides a list of the drainage sub-basins on the Airport and their respective areas.

Table 1. Existing Drainage Sub-Basin Areas

Name	Area (sq mi)	Area (ac)
DA01	0.0350625	22.44
DA02	0.00642187	4.11
DA03	0.01628125	10.42
DA04	0.01659375	10.62
DA05	0.00115625	0.74
DA06	0.08129687	52.03
DA07	0.04723437	30.23
DA08	0.06539062	41.85
DA09	0.01440625	9.22
DA10	0.0126875	8.12
DA11	0.01345312	8.61

Name	Area (sq mi)	Area (ac)
DA12	0.00285937	1.83
DA13	0.00128125	0.82
DA14	0.00517187	3.31
DA15	0.01375	8.80
DA16	0.0079375	5.08
DA17	0.0086875	5.56
DA18	0.00153125	0.98
DA19	0.00857812	5.49
DA20	0.02671875	17.10
DA21	0.10442187	66.83

4.2 Time of Concentration

Time of concentration is based upon the actual travel time of storm water flows from the most remote point in the drainage sub-basin to the point of runoff. BDD#4 regulation criteria was used to determine time of concentration values. **Equation 1** below gives the equation used to determine time of concentration.

Equation 1. BDD #4 Time of Concentration Methodology

$$Tc = D / (60*v) + Ti$$

The longest flow paths (D) were determined for each drainage area. An initial time (Ti) was added depending on the type of flow: 10 minutes for developed and 15 for undeveloped. The following velocities (v) given in **Table 2** below were used to determine time of concentration based on surface type of land cover.

Table 2. Existing Time of Concentration Velocity Values

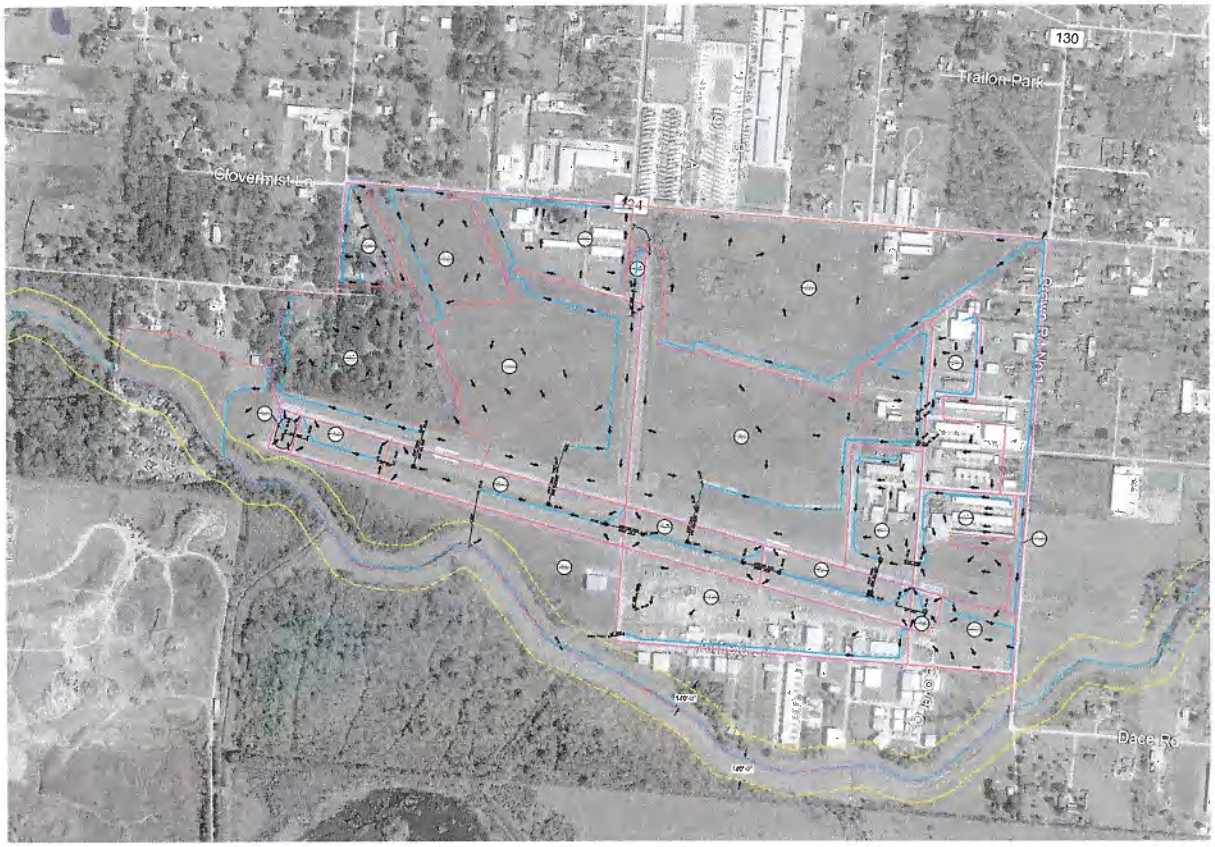
Surface Type	Undeveloped Flows Minimum Velocity V (fps)	Developed Flows Min Velocity V (fps)
Storm Sewer	3.00	3.00
Ditch / Channel	2.00	2.50
Paved Area	1.50	1.50
Bare Ground	0.50	1.00
Grass	0.35	0.50
Thick Vegetation	0.25	0.35

The flow paths are shown on **Exhibit 3**, Existing Drainage Areas. Tc's were also calculated for routing flow through a sub-basin and the routings were modeled using the Lag Method. **Appendix A** contains the backup data taken from GIS and the Tc calculation of each flow path. The lag time used in the hydrologic model was calculated as 60% of the Tc, as provided in **Table 3**.

Table 3. Existing Time of Concentration Values

Name	Tc (min)	T_{lag} (min)
DA01	37.35	22.41
DA02	16.74	10.04
DA03	29.63	17.78
DA04	23.29	13.97
DA05	21.96	13.18
DA06	101.19	60.71
DA07	60.96	36.58
DA08	61.20	36.72
DA09	16.86	10.12
DA10	24.11	14.47
DA11	16.99	10.19

Name	Tc (min)	T_{lag} (min)
DA12	15.76	9.46
DA13	13.55	8.13
DA14	14.14	8.48
DA15	16.76	10.06
DA16	15.57	9.34
DA17	16.11	9.67
DA18	11.40	6.84
DA19	28.76	17.26
DA20	23.12	13.87
DA21	28.47	17.08



300' 0 300' 600'
GRAPHIC SCALE IN FEET

LEGEND

- A-1 / 2.0 — AREA NO. / ACRES
- FLOW ARROW
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION PATH
- EXISTING STORM PIPE
- COWART CREEK
- COWART CREEK EASEMENT

Approved September 14 2021

EXHIBIT 3
EXISTING DRAINAGE AREAS AND TIME OF CONCENTRATION

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

SHEET NO. 3

4.3 Curve Numbers

The SCS method was used to calculate composite curve numbers based on soil type and land use. Soils data was downloaded from the NRCS Web Soil Survey and aerial imagery and on-site observations provided the basis to determine the existing land use. Antecedent Runoff Condition (ARC, former AMC) II curve numbers for each corresponding soils and land use was taken from Table 2-2a of TR-55 as presented in **Appendix B**. ARC II curve numbers represent average soil moisture conditions before a storm event. **Appendix C** contains the backup data and a pivot table of the area for soils versus land use. The curve numbers for each soil type and land use are below in **Table 4**. The hydrologic soil groups are shown in **Exhibit 4** and existing impervious cover on **Exhibit 5**.

Table 4. Curve Number Key

		Curve numbers for hydrologic soil group			
	Cover type and hydrologic condition	A	B	C	D
Open Space (lawns, golf courses, cemeteries, etc.)	Poor condition (grass cover < 50%)	68	79	86	89
	Fair condition (grass cover 50% to 75%)	49	69	79	84
	Good condition (grass cover > 75%)	39	61	74	80
Impervious Areas	Paved parking lots, roofs, driveways	98	98	98	98
	Paved; curbs and storm sewers	98	98	98	98
	Paved; open ditches	83	89	92	93
	Gravel	76	85	89	91
	Dirt	72	82	87	89
Western desert urban areas	Natural desert landscaping (pervious areas only)	63	77	85	88
	Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)	96	96	96	96
Urban districts	Commercial business	89	92	94	95
	Industrial	81	88	91	93
Residential districts by average lot size	1/8 acre or less (town house)	77	85	90	92
	1/4 acre	61	75	83	87
	1/3 acre	57	72	81	86
	1/2 acre	54	70	80	85
	1 acre	51	68	79	84
	2 acres	46	65	77	82
Developing urban areas	Newly graded areas (pervious areas only, no vegetation)	77	86	91	94

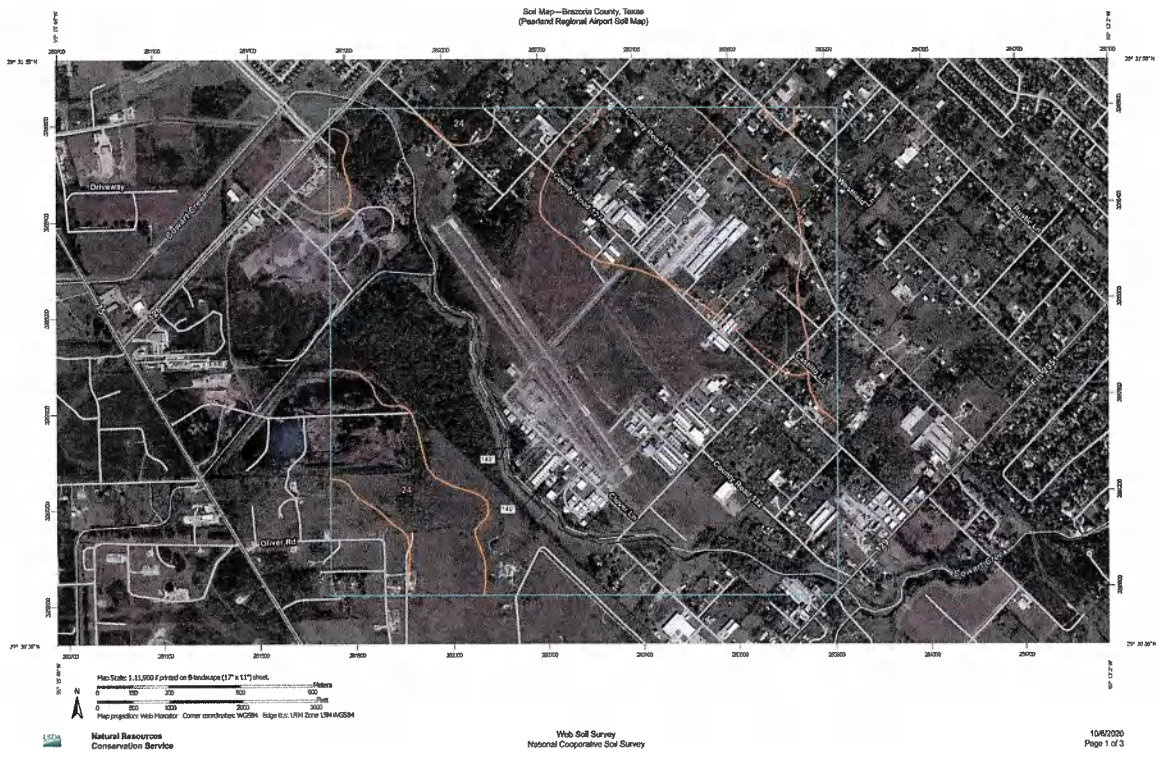
The composite curve number is calculated using the weighted average method as per **Equation 2.**

Equation 2. Curve Number

$$CN = \frac{\sum(CN * A)}{\sum A}$$

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Arat fine sandy loam	6.0	0.6%
7	Pledmont clay loam, 0 to 1 percent slopes	724.8	68.3%
8	Bernard-Edna complex, 0 to 1 percent slopes	177.5	16.7%
34	Lake Charles clay, 0 to 1 percent slopes	153.0	14.4%
Totals for Area of Interest		1,061.3	100.0%

ALL SOILS ON SITE
ARE HYDROLOGIC GROUP D



Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

10/6/2020
Page 1 of 3

Approved September 14 2021

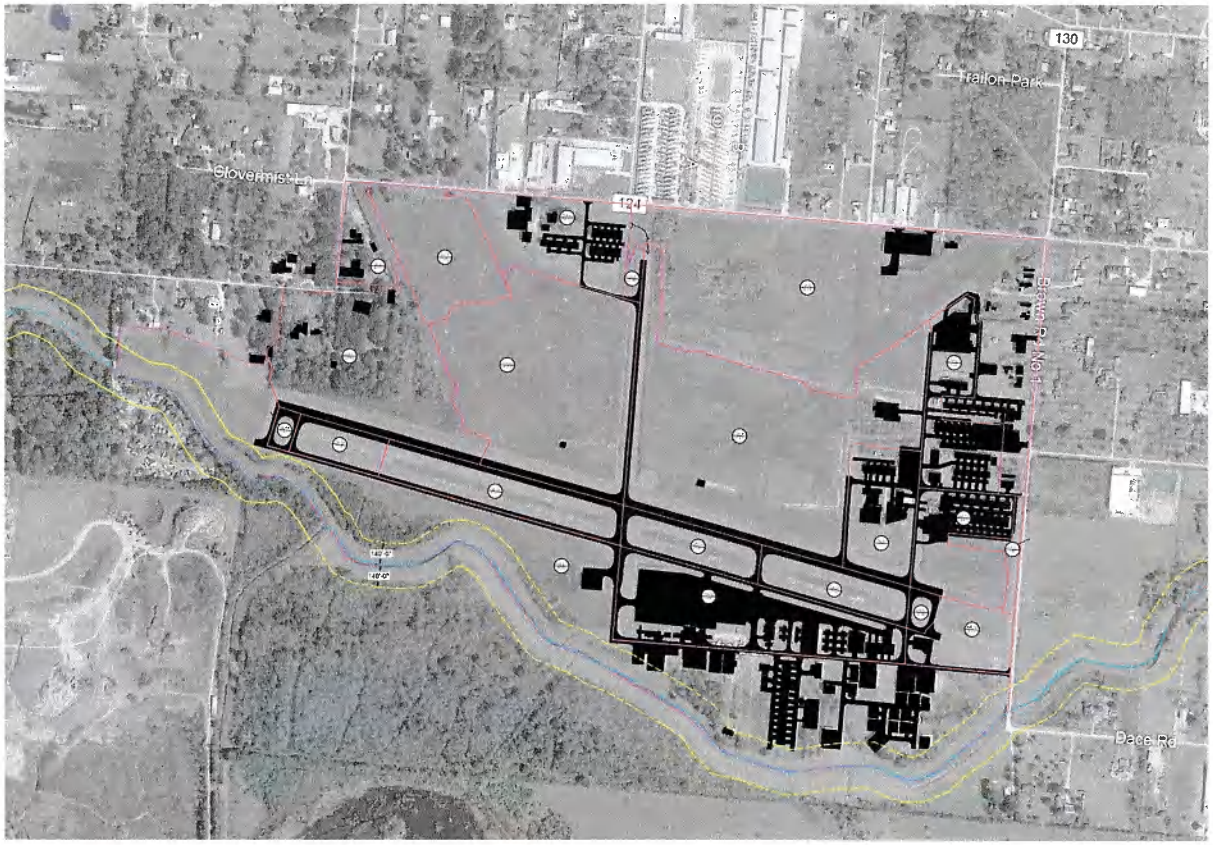
BRAZORIA COUNTY DRAINAGE DISTRICT 4

EXHIBIT 4
SOIL MAP

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

4



300' 0 300' 600'
GRAPHIC SCALE IN FEET

LEGEND

- A-1 / 20 — AREA NO. / ACRES
- DRAINAGE AREA BOUNDARY
- IMPERVIOUS COVER
- COWART CREEK
- COWART CREEK EASEMENT

Approv d September 14 2021

EXHIBIT 5
EXISTING IMPERVIOUS COVER

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

SHEET NO.
5

4.3.1 Initial Abstraction

The SCS Runoff Curve Number method is used to calculate runoff for the Airport in HMS.

Equation 3. SCS Runoff

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

One parameter in the SCS method is initial abstraction (I_a), which accounts for all losses before runoff begins. It is dependent on soil and cover parameters. Soil and cover parameters are represented by the potential maximum retention after runoff begins (S). The equation to calculate maximum retention is below.

Equation 4. Maximum Retention

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

Initial abstraction is calculated after maximum retention is determined.

Equation 5. Initial Abstraction

$$I_a = 0.2S$$

A summary of the composite curve numbers and initial abstraction values based on the process described previously are presented in **Table 5.**

Table 5. Existing Curve Numbers

Name	Composite CN	Initial Abstraction (I_a)
DA01	81.37	0.46
DA02	81.76	0.45
DA03	80.00	0.50
DA04	83.74	0.39
DA05	83.87	0.38
DA06	81.29	0.46
DA07	80.85	0.47
DA08	81.22	0.46
DA09	89.95	0.22
DA10	87.07	0.30
DA11	86.60	0.31

Name	Composite CN	Initial Abstraction (I_a)
DA12	82.11	0.44
DA13	88.71	0.25
DA14	84.56	0.37
DA15	84.27	0.37
DA16	84.97	0.35
DA17	84.60	0.36
DA18	89.19	0.24
DA19	82.43	0.43
DA20	91.83	0.18
DA21	82.94	0.41

5.0 INTERIM CONDITIONS

Although the *Airport Master Plan for the Pearland Regional Airport* prepared by Coffman Associates, Inc., dated May 2014, provides the basis for the ultimate future development condition on the Airport, it is likely that this ultimate development condition will not be reached for 20 years or more. Modeling only the ultimate development condition will provide drainage and detention recommendations that, if built, would remain oversized for an extended period of time. The purpose of the interim condition is to provide drainage and detention analysis for a development scenario anticipated within a shorter timeframe than the 20-year planning horizon in the Airport Master Plan, or likely within 5 to 10 years.

Based on discussions with the Airport, the interim development is assumed to include housing development in the open area east of Taxiway B, an additional taxiway north of the runway, buildings, driveways, and hangars in the area south of the runway. The improvements are partially indicated in the "Master Plan Concept" in the Airport Master Plan and shown in **Exhibit 6**. The existing hydrologic parameters were recalculated to account for this assumed interim development condition.

5.1 Drainage Area Delineation

The existing drainage areas were updated as necessary based on the interim development layout. Drainage areas were revised to account for the addition of a taxiway which acts as a barrier to flow in the existing drainage channels. Drainage patterns were also revised from existing conditions to account for the residential development. Table **6** presents a summary of the areas.

Table 6. Interim Drainage Areas

Name	Area (sq mi)	Area (ac)
DA01	0.03440625	22.02
DA02	0.00642187	4.11
DA03	0.01628125	10.42
DA04	0.01659375	10.62
DA05	0.00115625	0.74
DA06	0.120875	77.36
DA07	0.02609375	16.70
DA08	0.04789062	30.65
DA09	0.01440625	9.22
DA10	0.0126875	8.12
DA11	0.01345312	8.61

Name	Area (sq mi)	Area (ac)
DA12	0.00285937	1.83
DA13	0.00128125	0.82
DA14	0.00517187	3.31
DA15	0.01375	8.80
DA16	0.0079375	5.08
DA17	0.0086875	5.56
DA18	0.00153125	0.98
DA19	0.00857812	5.49
DA20	0.02671875	17.10
DA21	0.10442187	66.83

5.2 Time of Concentration

The Tc paths were updated as per the interim drainage areas, and Tc's were recalculated to account for the interim development. **Table 7** presents a summary of the Tc's. **Exhibit 6** shows the flow paths of the Tc's. **Appendix D** contains the back data and calculations.

Table 7. Interim Time of Concentration

Name	Tc (min)	T_{lag} (min)
DA01	37.35	22.41
DA02	16.74	10.04
DA03	29.63	17.78
DA04	23.29	13.97
DA05	21.96	13.18
DA06	39.13	23.48
DA07	66.67	40.00
DA08	60.96	36.58
DA09	16.86	10.12
DA10	24.11	14.47
DA11	16.99	10.19

Name	Tc (min)	T_{lag} (min)
DA12	15.76	9.46
DA13	13.55	8.13
DA14	14.14	8.48
DA15	16.76	10.06
DA16	15.57	9.34
DA17	16.11	9.67
DA18	11.40	6.84
DA19	28.76	17.26
DA20	23.12	13.87
DA21	28.47	17.08

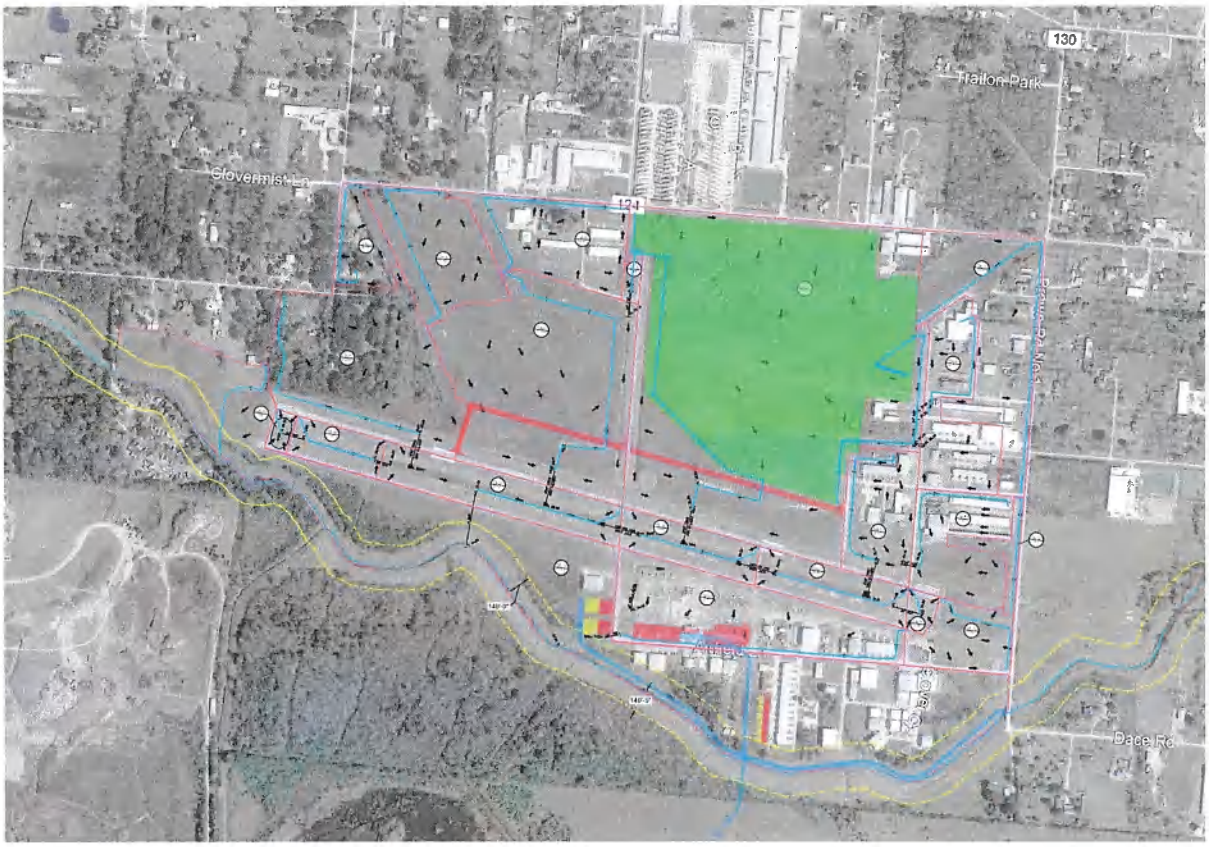
5.3 Curve Numbers

The current land use was updated based on possible interim development determined by available detention capacity. Interim development can add a high-density housing development in the open area east of Taxiway B, an additional taxiway north of the runway, buildings, driveways and hangars in the area south of the runway indicated in the Airport Master Plan. ARC II curve numbers were used to represent average conditions. **Exhibit 7** depicts the interim areas of impervious cover and a summary of the composite curve numbers is presented on **Table 8**. **Appendix E** contains the backup data and a summary pivot table.

Table 8. Interim Curve Numbers

Name	Composite CN	Initial Abstraction (I_a)
DA01	86.49	0.31
DA02	81.76	0.45
DA03	80.00	0.50
DA04	83.74	0.39
DA05	83.87	0.38
DA06	89.62	0.23
DA07	82.98	0.41
DA08	85.25	0.35
DA09	89.95	0.22
DA10	87.07	0.30
DA11	86.60	0.31

Name	Composite CN	Initial Abstraction (I_a)
DA12	82.11	0.44
DA13	88.71	0.25
DA14	84.56	0.37
DA15	84.27	0.37
DA16	84.97	0.35
DA17	84.60	0.36
DA18	89.19	0.24
DA19	82.43	0.43
DA20	91.83	0.18
DA21	82.94	0.41



GRAPHIC SCALE IN FEET

LEGEND

- A-1 / 2.0 — AREA NO. / ACRES
- FLOW ARROW
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION PATH
- EXISTING STORM PIPE
- ULTIMATE AIRFIELD PAVEMENT
- ULTIMATE ROAD / PARKING
- ULTIMATE BUILDING
- FUTURE HIGH DENSITY HOUSING
- COWART CREEK
- COWART CREEK EASEMENT

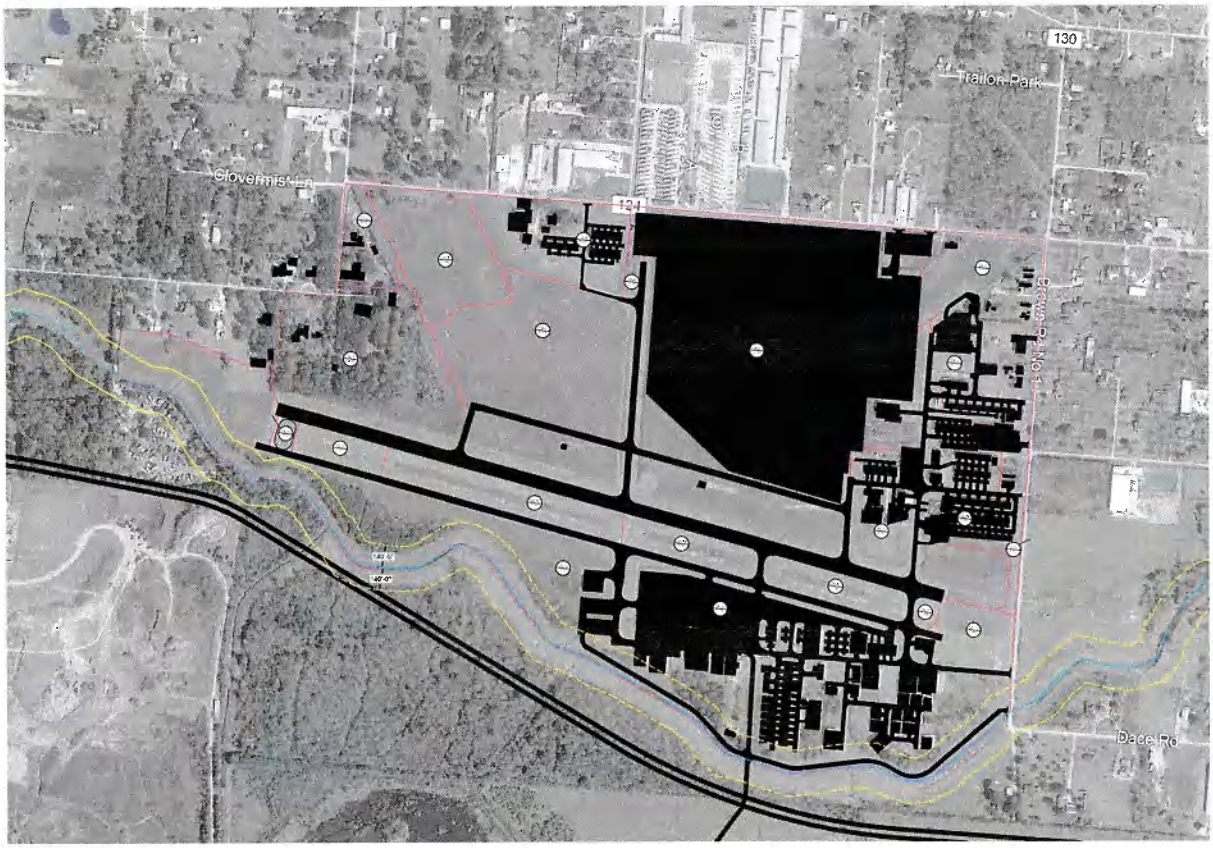
Approved September 14, 2021

EXHIBIT 6
INTERIM DRAINAGE AREAS AND TIME OF CONCENTRATION

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

6



GRAPHIC SCALE IN FEET

LEGEND

- A-1 / 2.0 — AREA NO. / ACRES
- DRAINAGE AREA BOUNDARY
- IMPERVIOUS COVER
- COWART CREEK
- COWART CREEK EASEMENT

Approved September 14 2021

EXHIBIT 7
INTERIM IMPERVIOUS COVER

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

SHEET NO.
7

6.0 FUTURE CONDITIONS

This section provides an explanation of the methodologies used for the hydrologic analysis of the ultimate future land use. Ultimate buildout conditions were determined from the Airport Master Plan's "Master Plan Concept" as amended per the Airport's latest development plans. Future development is expected to include buildings, aprons, roads, parking, taxiways, runway extensions, office space, and residential development. The hydrologic parameters were recalculated to account for this future development.

6.1 Drainage Area Delineation

The existing drainage areas were updated as necessary based on the future development. Drainage areas were revised/added because future development acts as a barrier to flow in the existing channels. Six new drainage areas were created for the future runway extensions and new road and taxiway additions. **Table 9** presents a summary of the areas.

Table 9. Future Drainage Areas

Name	Area (sq mi)	Area (ac)
DA01	0.0223125	14.28
DA02	0.00642187	4.11
DA03	0.01384375	8.86
DA04	0.01682812	10.77
DA05	0.00107812	0.69
DA06	0.10304687	65.95
DA07	0.02609375	16.70
DA08	0.01753125	11.22
DA09	0.02084375	13.34
DA10	0.01440625	9.22
DA11	0.00865625	5.54
DA12	0.00834375	5.34
DA13	0.00273437	1.75
DA14	0.01254687	8.03

Name	Area (sq mi)	Area (ac)
DA15	0.0250625	16.04
DA16	0.00614062	3.93
DA17	0.00375	2.40
DA18	0.00528125	3.38
DA19	0.00901562	5.77
DA20	0.003875	2.48
DA21	0.01779688	11.39
DA22	0.0086875	5.56
DA23	0.04725	3.24
DA24	0.02665625	17.06
DA25	0.00498437	3.19
DA26	0.063375	40.56
DA27	0.0365	23.36

6.2 Time of Concentration

The Tc paths were updated as per future drainage areas and Tc's were recalculated to account for the future development. **Table 10** presents a summary of the Tc's. **Exhibit 6** shows the flow paths of the Tc's. **Appendix F** contains the backup data and calculations.

Table 10. Future Time of Concentration

Name	Tc (min)	T_{lag} (min)
DA01	43.54	26.12
DA02	16.74	10.04
DA03	22.86	13.72
DA04	21.00	12.60
DA05	13.10	7.86
DA06	34.93	20.96
DA07	30.38	18.23
DA08	41.21	24.73
DA09	18.07	10.84
DA10	18.08	10.85
DA11	23.33	14.00
DA12	16.13	9.68
DA13	15.76	9.46
DA14	20.14	12.08

Name	Tc (min)	T_{lag} (min)
DA15	16.68	10.01
DA16	18.48	11.09
DA17	15.82	9.49
DA18	18.35	11.01
DA19	28.41	17.05
DA20	13.47	8.08
DA21	22.58	13.55
DA22	16.11	9.67
DA23	25.70	15.42
DA24	23.12	13.87
DA25	20.54	12.32
DA26	29.37	17.62
DA27	25.03	15.02

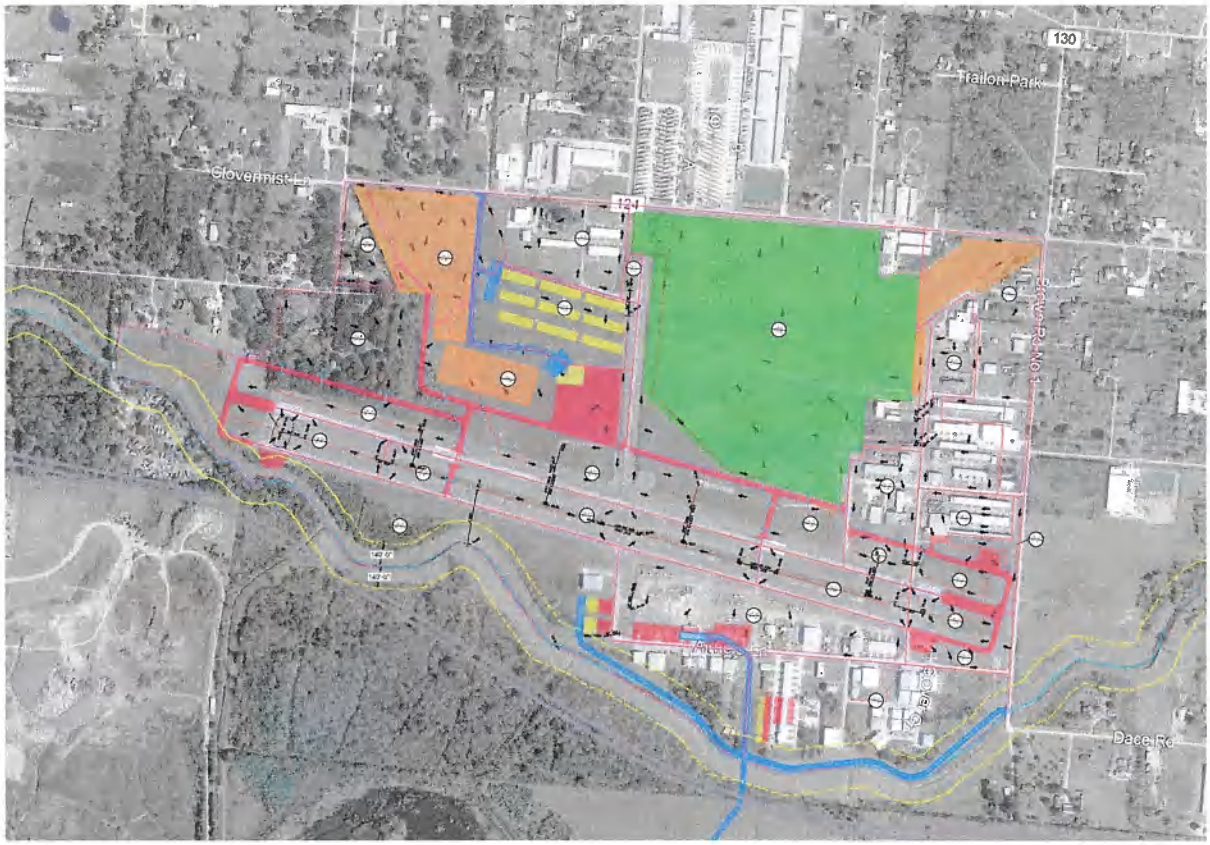
6.3 Curve Numbers

The current land use was updated per the Airport Master Plan. The future development plan will include apron, buildings, office space, roads, parking lots, taxiways, runway extensions, and residential development. ARC II curve numbers were used to represent average conditions. **Exhibit 7** depicts the future land use and a summary of the composite curve numbers is presented on **Table 11**. **Appendix G** contains the backup data and a summary pivot table.

Table 11. Future Curve Numbers

Name	Composite CN	Initial Abstraction (I_a)
DA01	82.31	0.43
DA02	84.94	0.35
DA03	93.14	0.15
DA04	84.06	0.38
DA05	84.19	0.38
DA06	90.51	0.21
DA07	86.59	0.31
DA08	85.38	0.34
DA09	91.06	0.20
DA10	89.95	0.22
DA11	89.23	0.24
DA12	91.89	0.18
DA13	83.12	0.41
DA14	84.76	0.36

Name	Composite CN	Initial Abstraction (I_a)
DA15	83.66	0.39
DA16	84.31	0.37
DA17	85.37	0.34
DA18	84.99	0.35
DA19	84.01	0.38
DA20	84.70	0.36
DA21	84.24	0.37
DA22	84.60	0.36
DA23	85.28	0.35
DA24	93.31	0.14
DA25	85.10	0.35
DA26	82.78	0.42
DA27	86.80	0.30



GRAPHIC SCALE IN FEET

LEGEND

- AREA NO. / ACRES
- FLOW ARROW
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION PATH
- EXISTING STORM PIPE
- PROPOSED STORM PIPE
- ULTIMATE AIRFIELD PAVEMENT
- ULTIMATE ROAD / PARKING
- ULTIMATE BUILDING
- TO BE REMOVED
- AIRFIELD ACCESS REVENUE SUPPORT
- FUTURE HIGH DENSITY HOUSING
- COWART CREEK
- COWART CREEK EASEMENT

Approved September 14 2021

EXHIBIT 8
ULTIMATE DRAINAGE AREAS AND TIME OF CONCENTRATION

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

8

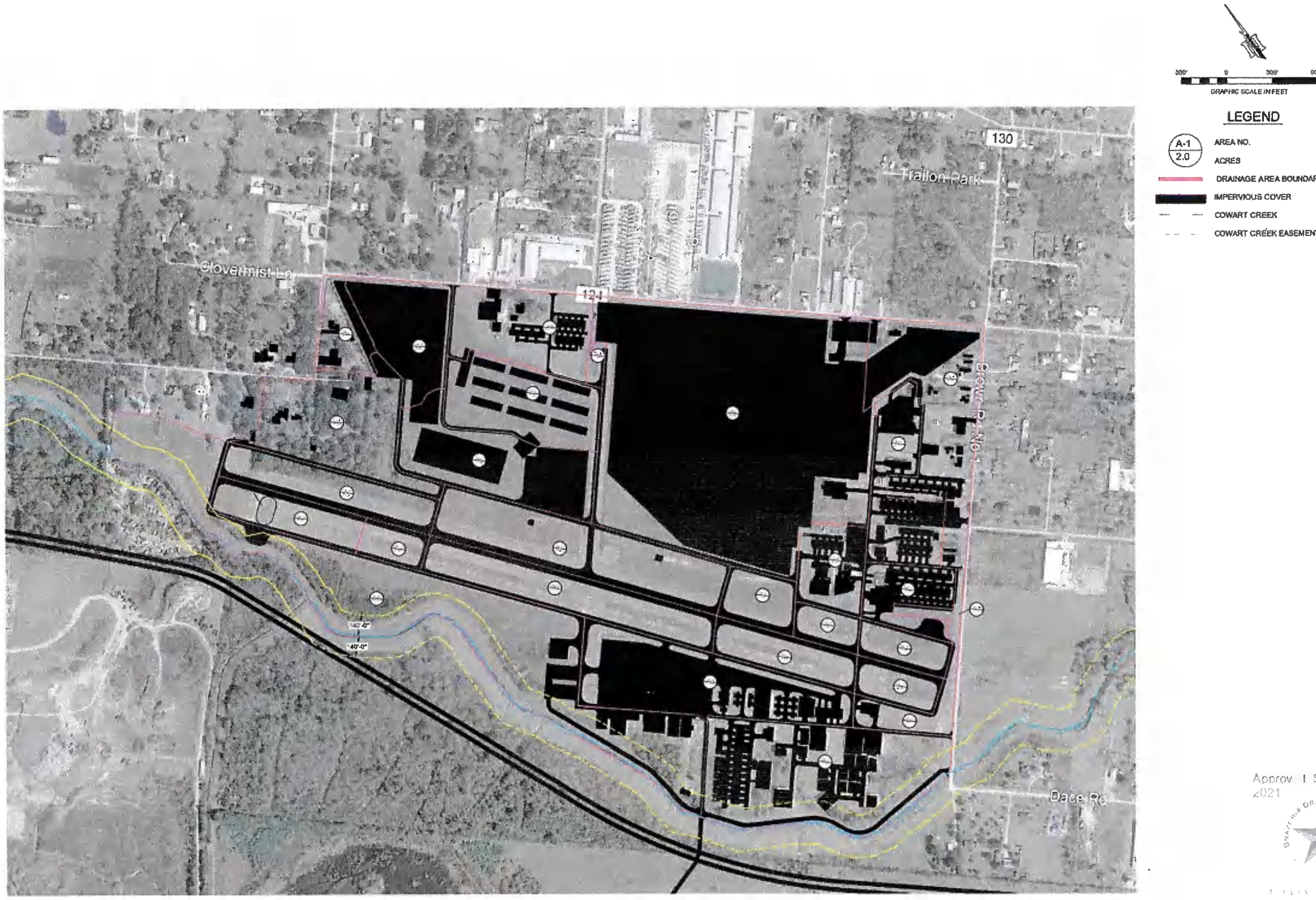


EXHIBIT 9
ULTIMATE IMPERVIOUS COVER

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

Approved September 14 2021

SHEET NO. 9

7.0 RAINFALL DATA

Precipitation depths for each storm event were taken from the BDD#4 regulations. The SCS 24-hour Type III rainfall distribution was used to analyze the 3-, 5-, 10-, 25-, and 100-year (33%, 20%, 10%, 4%, and 1% respectively) storm events. **Table 12** presents the bold depths used in the HMS model.

Table 12. Rainfall Data

Minutes	Rainfall Event				
	3-YR	5-YR	10-YR	25-YR	100-YR
5	0.70	0.80	0.90	1.00	1.20
30	1.60	1.90	2.10	2.40	3.00
60	2.20	2.50	2.90	3.40	4.30
120	2.60	3.10	3.70	4.40	5.70
180	2.80	3.50	4.20	5.10	6.80
360	3.30	4.40	5.30	6.60	9.10
720	4.00	5.30	6.40	8.00	11.10
1440	**4.80**	**6.40**	**7.80**	**9.80**	**13.50**

8.0 HYDROLOGIC MODEL

HEC-HMS Version 4.2.1 was used to compute the discharge for existing, interim and ultimate buildout conditions. The hydrologic parameters discussed above were input into HMS. Existing, interim, and ultimate basin models were developed to quantify existing, interim, and ultimate buildout conditions. **Appendix H** contains schematics of the HMS basin models. Once the hydrology was calculated, the detention analysis determined the storage capacity needed to mitigate impacts of the conceptual construction improvements. **Appendix I** contains the results from the HMS model.

8.1 Detention Analysis

The ultimate buildout condition development will add impervious area (roads, buildings, parking lots, taxiway, apron and other paved areas) to the Airport site and increase storm water runoff. This increase in storm water runoff could potentially create a flood hazard to the airport and its adjacent areas, if adequate drainage infrastructure is not in place. Storm water detention ponds temporarily impound or detain excess storm water. Detention must be provided to reduce the future development peak discharge rate to the existing development discharge rate, per BDD#4 regulations. BDD#4's minimum rate of detention is 0.65 ac-ft / ac.

Runoff from Pearland Regional Airport outfalls in three general locations: northeast toward the ditch along County Road 127, south to the ditch along County Road 130, and southwest to the detention ponds in between the runway and taxiway. Runoff ultimately travels to Cowart Creek.

Currently, there are 4 detention ponds in between the runway and taxiway as shown in **Exhibit 8**. The existing pond rating curves are shown in **Tables 13-16**.

Table 13. Existing Stage-Storage Pond 1

Pond 1 - DA 14		
Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
34.75	0.000	0.0
35.5	0.028	4.4
36	0.047	7.4
36.5	0.099	10.6
37	0.188	16.0
37.5	0.313	20.7
38	0.476	23.9
38.5	0.688	27.0
39.0	0.955	30.0
39.5	1.284	32.3
40.0	1.676	34.5
40.5	2.135	36.7
41.0	2.664	38.9
41.5	3.301	40.9
42.0	4.112	42.6
42.5	5.134	44.4
43.0	6.437	46.1

Table 14. Existing Stage-Storage Pond 2

Pond 2 - DA 15		
Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
27.37	0.00	0.0
29	0.08	13.5
29.5	0.18	22.0
30	0.38	32.0
30.5	0.70	43.7
31	1.16	56.2
31.5	1.73	69.2
32.0	2.40	82.8
32.5	3.15	96.5
33.0	3.96	108.2
33.5	4.83	117.2
34.0	5.77	125.4
34.5	6.76	133.1
35.0	7.82	140.4
35.5	8.93	147.3
36.0	10.11	153.8
36.5	11.35	160.2
37.0	12.64	166.3
37.5	14.00	172.1
38.0	15.41	177.8
38.5	16.88	183.2
39.0	18.43	188.6
39.5	20.10	193.3
40.0	21.96	197.7
40.5	24.11	201.9
41.0	26.60	205.8
41.5	29.53	209.8
42.0	33.04	213.5
43.0	41.52	221.0

Table 15. Existing Stage-Storage Pond 3

Pond 3 - DA 16		
Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
29.92	0.00	0.0
31.5	0.14	27.7
32	0.32	41.5
32.5	0.61	57.1
33	0.95	73.7
33.5	1.33	90.3
34	1.74	105.6
34.5	2.19	117.7
35.0	2.67	127.8
35.5	3.19	136.7
36.0	3.74	144.8
36.5	4.32	152.1
37.0	4.94	158.7
37.5	5.59	163.0
38.0	6.28	166.8
38.5	7.00	171.4
39.0	7.77	180.0
39.5	8.61	184.9
40.0	9.65	189.8
40.5	10.97	193.9
41.0	12.70	198.0
41.5	14.82	201.8
42.0	17.25	205.5

Table 16. Existing Stage-Storage Pond 4

Pond 4 - DA 17		
Elevation (ft)	Storage (ac-ft)	Discharge (cfs)
30.65	0.00	0.0
32.5	0.56	33.2
33	0.90	46.7
33.5	1.31	61.2
34	1.79	76.6
34.5	2.32	92.2
35	2.92	107.4
35.5	3.57	120.4
36.0	4.30	131.4
36.5	5.09	141.0
37.0	5.99	149.7
37.5	7.05	157.1
38.0	8.32	162.1
38.5	9.84	165.6
39.0	11.67	169.1
39.5	13.82	175.5
40.0	16.35	181.8
40.5	19.16	186.3

GRAPHIC SCALE IN FEET
300' 0 300' 600'

LEGEND

COWART CREEK

COWART CREEK EASEMENT

EXHIBIT 10
EXISTING POND LOCATIONS

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

KSA

Approved September 14 20_1

SHEET NO.
10

Table 17 presents the results from existing HEC-HMS model.

Table 17. Summary of HEC-HMS Pond Storage Results Existing Conditions

3-year				
ID	Existing			
	Inflow (cfs)	Outflow (cfs)	Peak Storage (ac-ft)	Water Surface Elevation (ft-msl)
Pond 1	12.0	9.7	0.1	36.4
Pond 2	192.4	128.0	6.1	34.2
Pond 3	115.2	101.8	1.6	33.9
Pond 4	61.9	44.9	0.9	32.9

5-year				
ID	Existing			
	Inflow (cfs)	Outflow (cfs)	Peak Storage (ac-ft)	Water Surface Elevation (ft-msl)
Pond 1	17.4	13.4	0.1	36.8
Pond 2	268.9	158.4	11.0	36.4
Pond 3	166.4	135.0	3.1	35.4
Pond 4	88.9	61.6	1.3	33.5

10-year				
ID	Existing			
	Inflow (cfs)	Outflow (cfs)	Peak Storage (ac-ft)	Water Surface Elevation (ft-msl)
Pond 1	22.1	16.5	0.2	37.1
Pond 2	329.0	178.8	15.7	38.1
Pond 3	211.1	157.5	4.8	36.9
Pond 4	112.4	75.5	1.8	34.0

25-year				
ID	Existing			
	Inflow (cfs)	Outflow (cfs)	Peak Storage (ac-ft)	Water Surface Elevation (ft-msl)
Pond 1	28.7	20.1	0.3	37.4
Pond 2	407.8	199.1	22.7	40.2
Pond 3	274.1	181.3	8.0	39.1
Pond 4	145.9	94.5	2.4	34.6

100-year				
ID	Existing			
	Inflow (cfs)	Outflow (cfs)	Peak Storage (ac-ft)	Water Surface Elevation (ft-msl)
Pond 1	40.9	24.5	0.5	38.1
Pond 2	542.1	217.2	37.3	42.5
Pond 3	384.4	202.7	15.4	41.6
Pond 4	207.1	123.4	3.8	35.6

The proposed interim detention plan will maximize grading in the existing detention ponds between the runway and taxiway to comply with the runway and taxiway safety area guidelines for a B-II Aircraft Approach Category as per the Federal Aviation Administration's (FAA) Advisory Circular (AC) 150/5320-5D, dated February 26, 2014. The interim detention plan will also add two additional ponds to increase the existing detention capacity and mitigate the increase in runoff from the interim development scenario. The ponds will be located north of the runway and split by Taxiway B.

The proposed detention plan for ultimate buildout conditions will add ponds in between the runway and the proposed taxiway to the northeast as proposed in the Airport Master Plan. The existing/interim ponds will be regraded and resized to account for the changes in pavement removal and additional available volume in this area. This drainage plan will maintain the same drainage patterns as the interim drainage conditions.

The results from the HEC-HMS model indicate the proposed changes to existing facilities and additions of new detention facilities may fully mitigate the peak flow impacts due to the proposed development in interim and ultimate buildout conditions for the 3-, 5-, 10-, 25-, and 100-year storm events. The proposed detention modeling results are summarized in **Tables 18-23** below.

Table 18. Elevation-Area for Interim Conditions

	Elevation (ft)	Acre (ac)
Interim Pond 1	27.37	0.00
	32.67	0.8545
	41	5.4584
	Elevation (ft)	Acre (ac)
Interim Pond 2	29.5	0.00
	31.17	0.2924
	39.5	2.0745
	Elevation (ft)	Acre (ac)
Interim Pond 3	30.65	0.00
	31.25	0.3450
	38	2.3515
	Elevation (ft)	Acre (ac)
Interim Pond 4	28.5	0.00
	30	2.3011
	41	4.7165
	Elevation (ft)	Acre (ac)
Interim Pond 5	31	0.00
	32.75	3.2999
	39	6.5769

Table 19. Elevation-Area for Ultimate Conditions

	Elevation (ft)	Acre (ac)
Ultimate Pond 1	31	0.00
	33	1.65
	42.5	4.60
	Elevation (ft)	Acre (ac)
Ultimate Pond 2	28.8	0.00
	31.5	6.49
	42	11.21
	Elevation (ft)	Acre (ac)
Ultimate Pond 3	30	0.00
	35	2.86
	42	4.88
	Elevation (ft)	Acre (ac)
Ultimate Pond 4	27.5	0.00
	31.5	2.75
	39.5	6.85

Ultimate pond 5 will remain the same as interim pond 3.

Table 20. Summary of HEC-HMS Pond Storage Results for Interim Conditions

3-year				
ID	Interim			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	163.5	86.3	11.6	36.2
Pond 2	108.6	101.3	1.9	32.9
Pond 3	61.9	34.7	1.3	32.3
Pond 4	45.6	33.2	1.4	30.1
Pond 5	185.1	78.4	8.4	34.1

5-year				
ID	Interim			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	227.1	100.8	21.1	39.6
Pond 2	153.9	144.2	2.9	33.7
Pond 3	88.9	52.0	1.9	32.8
Pond 4	67.4	42.4	2.4	30.4
Pond 5	259.5	110.4	11.9	34.8

10-year				
ID	Interim			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	286.9	216.6	23.1	40.3
Pond 2	196.6	185.0	3.7	34.5
Pond 3	112.4	68.2	2.4	33.2
Pond 4	86.7	51.6	3.3	30.6
Pond 5	324.0	141.0	14.9	35.4

25-year				
ID	Interim			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	379.5	348.1	23.7	40.5
Pond 2	261.5	247.4	4.8	35.6
Pond 3	145.9	92.2	3.0	33.7
Pond 4	114.2	66.0	4.6	31.0
Pond 5	415.5	187.9	19.2	36.3

100-year				
ID	Interim			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	549.6	541.4	24.3	40.7
Pond 2	389.5	358	7.3	38.0
Pond 3	207.1	138.1	4.2	34.7
Pond 4	164.7	95.1	6.9	31.7
Pond 5	583.3	281.8	26.9	37.9

Table 21. Summary of HEC-HMS Pond Storage Results Ultimate Conditions

3-year				
ID	Ultimate			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	39.0	32.8	0.9	32.6
Pond 2	267.9	101.0	12.7	32.3
Pond 3	46.8	20.3	2.9	33.0
Pond 4	205.7	202.1	3.1	30.9
Pond 5	129.7	84.1	2.8	33.6

5-year				
ID	Ultimate			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	57.7	47.5	1.2	33.0
Pond 2	378.2	132.6	18.4	32.9
Pond 3	70.9	28.1	4.3	34.5
Pond 4	290.6	286.0	3.7	31.5
Pond 5	186.5	127.8	3.9	34.5

10-year				
ID	Ultimate			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	74.1	53.3	1.7	33.2
Pond 2	474.2	162.2	23.3	33.5
Pond 3	82.1	31.2	5.8	35.3
Pond 4	363.7	330.9	5.1	31.8
Pond 5	236.1	167.3	4.9	35.2

25-year				
ID	Ultimate			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	97.5	63.5	2.5	33.5
Pond 2	610.5	207.5	30.3	34.3
Pond 3	98.1	33.5	8.0	35.9
Pond 4	470.1	412.0	7.4	32.3
Pond 5	306.6	225.0	6.1	36.2

100-year				
ID	Ultimate			
	Inflow	Outflow	Peak Storage	Water Surface Elevation
	(cfs)	(cfs)	(ac-ft)	(ft-msl)
Pond 1	140.6	84.5	4.0	34.0
Pond 2	860.9	289.6	43.4	35.8
Pond 3	129.8	37.6	12.6	37.0
Pond 4	666.0	577.4	11.6	33.2
Pond 5	435.7	327.0	8.1	38.0

Table 22. Summary of HEC-HMS Discharge Results

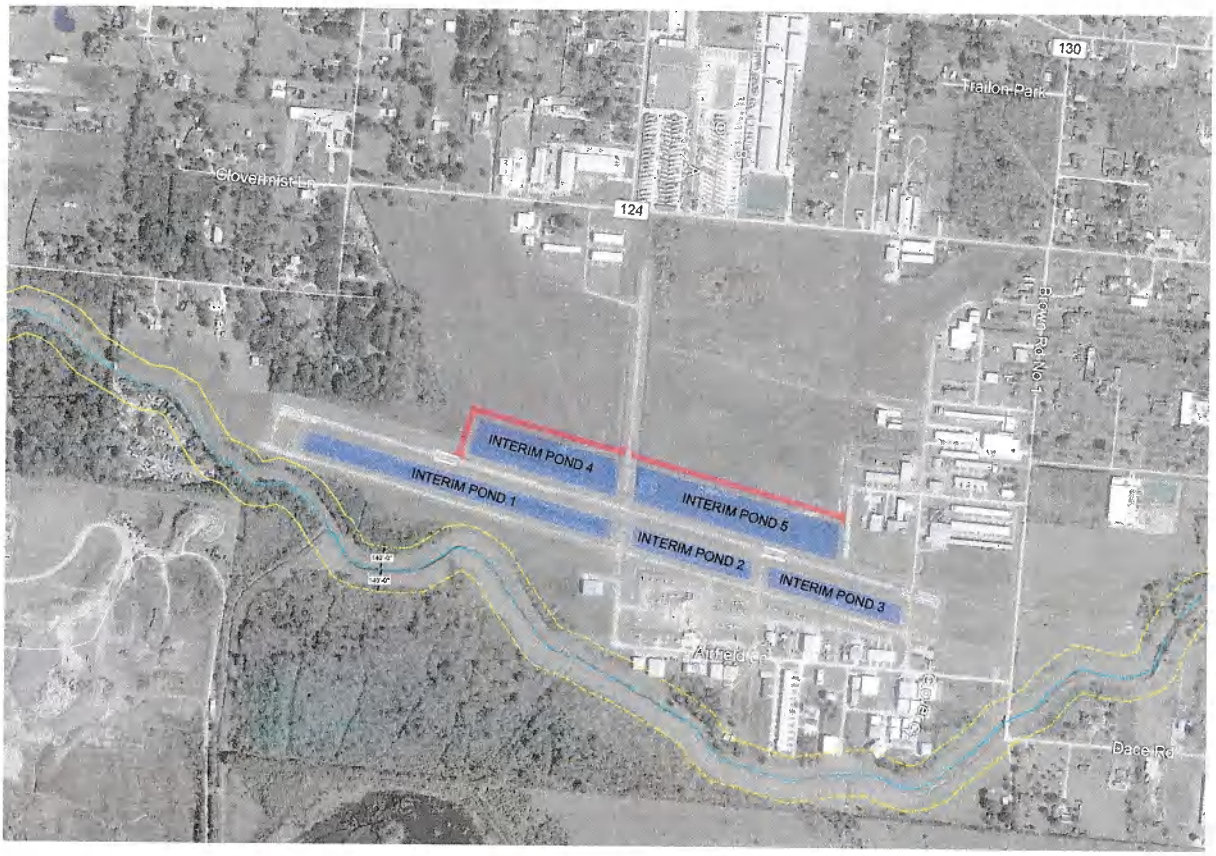
	Storm Event				
	3-YR	5-YR	10-YR	25-YR	100-YR
Total Discharge Existing Conditions (CFS)	353.9	506.4	633.6	811.7	1134.0
Total Discharge Interim Conditions (CFS)	338.4	467.4	581.0	741.3	1101.3
Total Discharge Ultimate Conditions (CFS)	241.9	370.3	481.0	637.7	926.0

Table **23** below shows the capacity of the existing, interim, and proposed ponds and their storage utilization for the 3-, 5-, 10-, 25-, and 100-year storm events.

Table 23. Detention Capacity vs Utilization

Pond	Capacity (ac-ft)	Peak Storage (ac-ft)					Percent Utilized				
		3-Yr	5-Yr	10-Yr	25-Yr	100-Yr	3-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Existing Pond 1	6.44	0.1	0.1	0.2	0.3	0.5	1.55%	1.55%	3.11%	4.66%	7.77%
Existing Pond 2	41.52	6.1	11	15.7	22.7	37.3	14.69%	26.49%	37.81%	54.67%	89.84%
Existing Pond 3	17.25	1.6	3.1	4.8	8.0	15.4	9.28%	17.97%	27.83%	46.38%	89.28%
Existing Pond 4	19.16	0.9	1.3	1.8	2.4	3.8	4.70%	6.78%	9.39%	12.53%	19.83%
Pond	Capacity (ac-ft)	Peak Storage (ac-ft)					Percent Utilized				
		3-Yr	5-Yr	10-Yr	25-Yr	100-Yr	3-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Interim Pond 1	74.39799	11.6	21.1	23.1	23.7	24.3	15.59%	28.36%	31.05%	31.86%	32.66%
Interim Pond 2	20.745	1.9	2.9	3.7	4.8	7.3	9.16%	13.98%	17.84%	23.14%	35.19%
Interim Pond 3	17.28353	1.3	1.9	2.4	3.0	4.2	7.52%	10.99%	13.89%	17.36%	24.30%
Interim Pond 4	58.95625	1.4	2.4	3.3	4.6	6.9	2.37%	4.07%	5.60%	7.80%	11.70%
Interim Pond 5	52.6152	8.4	11.9	14.9	19.2	26.9	15.96%	22.62%	28.32%	36.49%	51.13%

Pond	Capacity (ac-ft)	Peak Storage (ac-ft)					Percent Utilized				
		3-Yr	5-Yr	10-Yr	25-Yr	100-Yr	3-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Ultimate Pond 1	52.9	0.9	1.2	1.7	2.5	4.0	1.70%	2.27%	3.21%	4.73%	7.56%
Ultimate Pond 2	147.972	12.7	18.4	23.3	30.3	43.4	8.58%	12.43%	15.75%	20.48%	29.33%
Ultimate Pond 3	58.56	2.9	4.3	5.8	8.00	12.6	4.95%	7.34%	9.90%	13.66%	21.52%
Ultimate Pond 4	82.2	3.1	3.7	5.1	7.4	11.6	3.77%	4.50%	6.20%	9.00%	14.11%
Ultimate Pond 5	52.6152	2.8	3.9	4.9	6.1	8.1	5.32%	7.41%	9.31%	11.59%	15.39%



300' 0 300' 600'

GRAPHIC SCALE IN FEET

LEGEND

- ULTIMATE AIRFIELD PAVEMENT
- INTERIM DETENTION POND
- COWART CREEK
- COWART CREEK EASEMENT

EXHIBIT 11
INTERIM POND LOCATIONS

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

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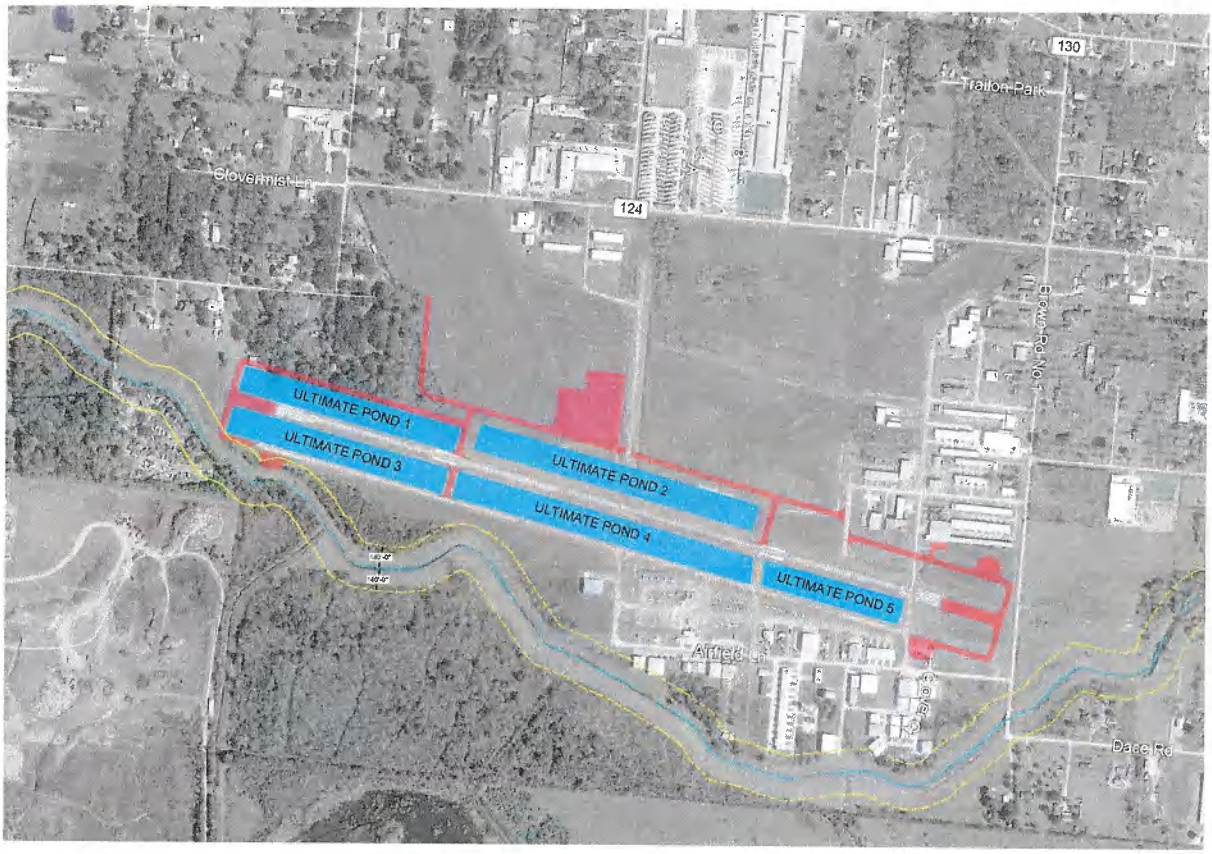
Approved September 14 2011

SHEET NO.
11



GRAPHIC SCALE IN FEET

LEGEND

- ULTIMATE AIRFIELD PAVEMENT
- ULTIMATE DETENTION POND
- COWART CREEK
- COWART CREEK EASEMENT

EXHIBIT 12
ULTIMATE POND LOCATIONS

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

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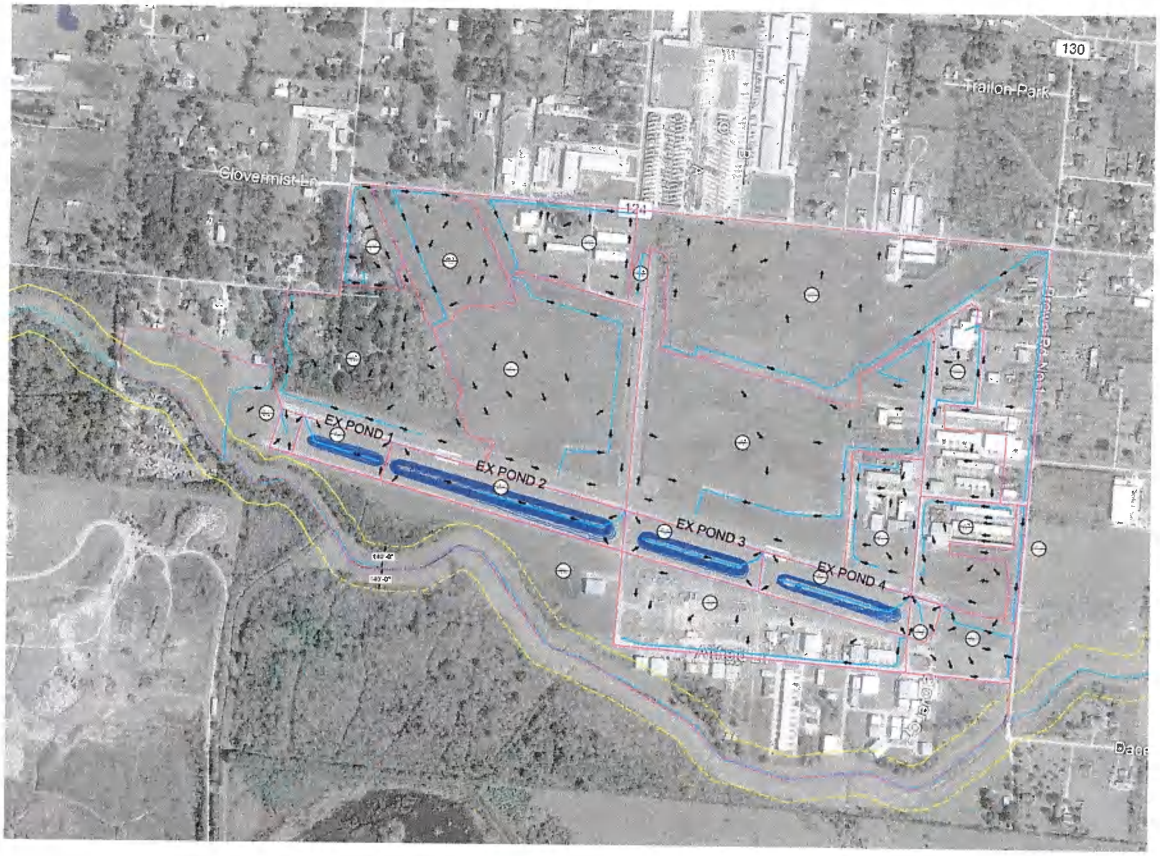
12



GRAPHIC SCALE IN FEET

LEGEND

- A-1 / 2.0 — AREA NO. / ACRES
- FLOW ARROW
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION PATH
- EXISTING STORM PIPE
- COWART CREEK
- COWART CREEK EASEMENT

Pond	Drainage Areas Served	Acreage	Curve Number	Downstream Facility
Existing Pond 1	DA-13	0.82	88.71	Existing Pond 2
	DA-14	3.31		
Existing Pond 2	DA-1	22.44	81.37	Cowart Creek
	DA-5	0.74		
	DA-7	30 23		
	DA-15	8 8		
Existing Pond 3	DA-8	41.85	81 22	Existing Pond 2
	DA-9	9.22		
	DA-16	5.08		
Existing Pond 4	DA-10	8 12	87.07	Existing Pond 3
	DA-11	8.61		
	DA-17	5.56		
	DA-18	0.98		

EXHIBIT 13
EXISTING DETENTION SERVICE AREA

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

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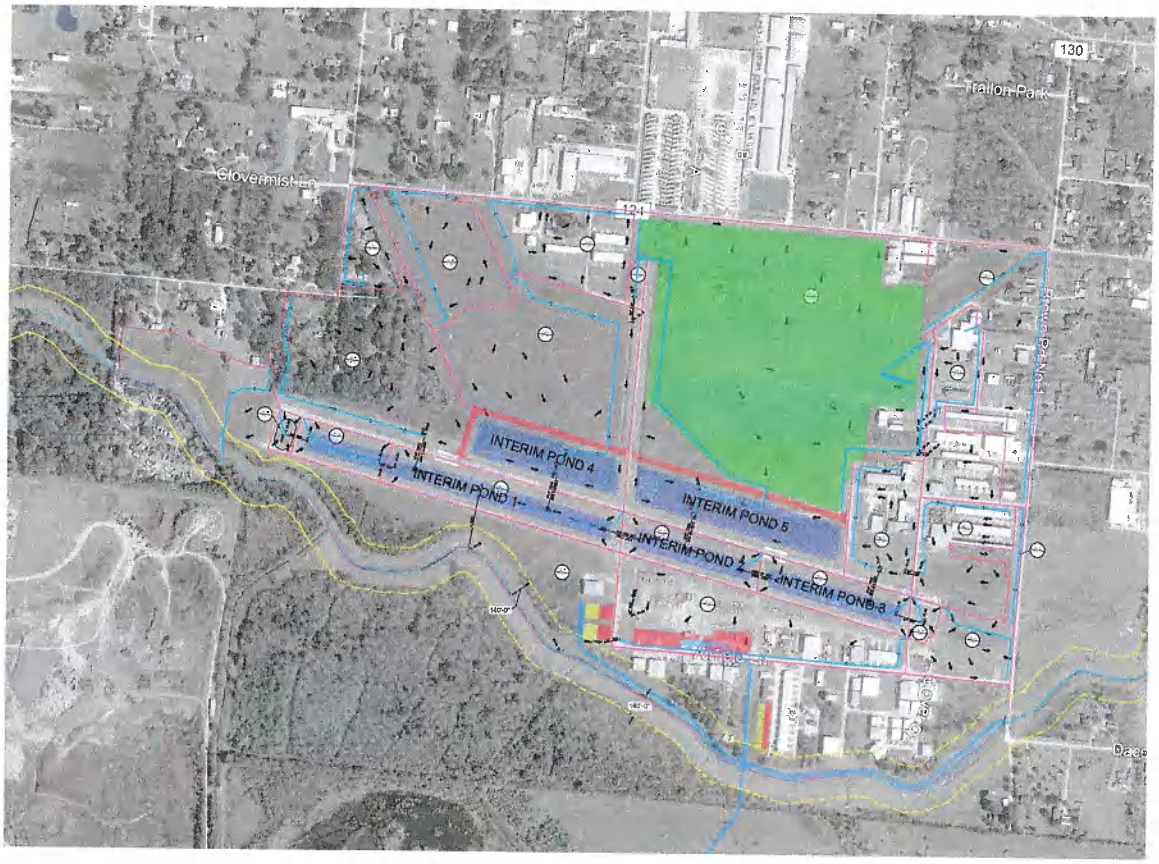
SHEET NO.
13



300' 0 300' 600'
GRAPHIC SCALE IN FEET

LEGEND

- A-1 / 2.0 — AREA NO. / ACRES
- FLOW ARROW
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION PATH
- EXISTING STORM PIPE
- ULTIMATE AIRFIELD PAVEMENT
- ULTIMATE ROAD / PARKING
- ULTIMATE BUILDING
- FUTURE HIGH DENSITY HOUSING
- COWART CREEK
- COWART CREEK EASEMENT
- INTERIM DETENTION POND

Pond	Drainage Areas Served	Acerage	Curve Number	Downstream Facility
Interim Pond 1	DA-1	22.02	86 49	Cowart Creek
	DA-13	0.82	88.71	
	DA-14	3.31	84.56	
	DA-15	8.80	84.27	
Interim Pond 2	DA-16	5.08	84.97	Interim Pond 1
Interim Pond 3	DA-10	8.12	87.07	Interim Pond 2
	DA-11	8 61	86 60	
	DA-17	5.56	84 60	
	DA-18	0 98	89 19	
Interim Pond 4	DA-5	0.74	83.87	Interim Pond 1
	DA-8	30.65	85.25	
Interim Pond 5	DA-6	77 36	89.62	Interim Pond 2
	DA-9	9.22	89.95	

Approved September 14 2021

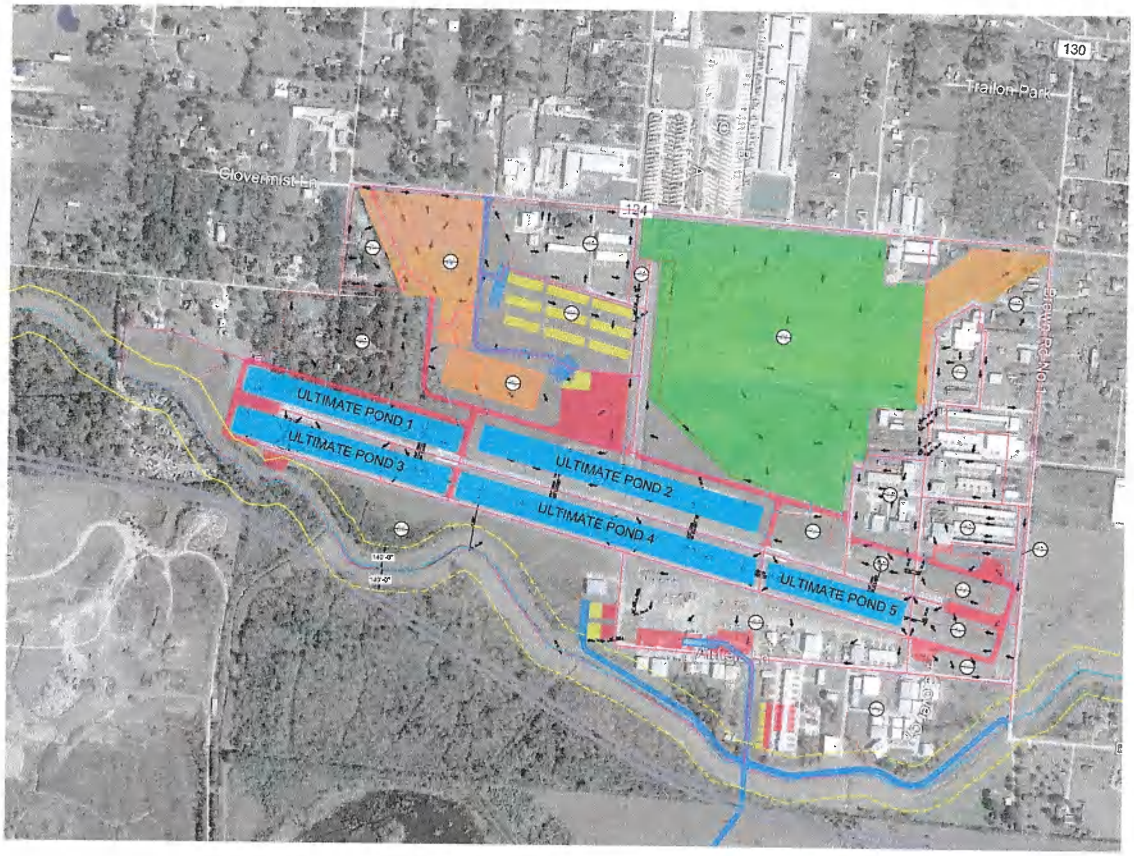
EXHIBIT 14
INTERIM DETENTION SERVICE AREAS

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

DRAWN BY: TC
DESIGNED BY: TC
LATEST REVISION: 03/15/2020

KSA

SHEET NO.
14



Pond	Drainage Areas Served	Acerage	Curve Number	Downstream Fadlity
Proposed Pond 1	DA-1	14.28	82.31	Proposed Pond 3
	DA-14	8.03	84.76	
Proposed Pond 2	DA-5	0.69	84.19	Proposed Pond 4
	DA-6	65.95	90.51	
	DA-8	11.22	85.38	
	DA-9	13.34	91.06	
	DA-10	9.22	89.95	
	DA-15	16.04	83 66	
	DA-16	3.93	84 31	
Proposed Pond 3	DA-19	5.77	84 01	Proposed Pond 4
	DA-20	2.49	84.70	
Proposed Pond 4	DA-21	11.39	84.24	Cowart Creek
Proposed Pond 5	DA-11	5.54	89.23	Proposed Pond 4
	DA-12	5.34	91.89	
	DA-17	2.40	85.37	
	DA-18	3 38	84.99	
	DA-22	5.56	84 6	
	DA-23	30 24	85 28	

Approved September 14 2021

EXHIBIT 15
ULTIMATE DETENTION SERVICE AREAS

SHEET NAME

PEARLAND REGIONAL AIRPORT MASTER DRAINAGE PLAN

PROJECT NAME

DRAWN BY: TC
DESIGNED BY: TC
LATEST REVISION: 10/15/2020
KSA JOB NO.: TAP008

KSA

SEAL:
TBPE Firm Registration No. F-1356

SHEET NO.
15

9.0 LOCALIZED DRAINAGE ELEMENTS

The Pearland Regional Airport contains over 13,000 linear feet of drainage ditches, culverts, and underground storm sewer in addition to the detention ponds between the runway and parallel taxiway. This drainage infrastructure is distributed throughout the Airport property and serves to convey storm water away from pavement, parking, and buildings and to the Airport's detention ponds and discharge waterway, Cowart Creek.

Proper design and maintenance of these localized drainage features is required for a functioning Airport-wide drainage system and helps to protect life and property from flood risks and hazardous wildlife. Ditches, culverts, inlets, and storm sewer pipe that is not adequately sized and maintained can present problems for the Airport including flooding of hangars and pavement, accelerated deterioration of airfield pavement and other infrastructure from saturation of soils, and ponding water between storm events which attracts wildlife. Based on site observations and discussions with Airport staff, the following has been identified as an existing localized drainage problem:

1. Storm inlets and storm sewer along Airfield Lane, near the Terminal Building, does not properly drain the area leading to ponding water and, in significant rain events, flooding of Airport infrastructure.

The scope of this master plan does not include a detailed as-built survey of these localized drainage features, so the specific problem causing the inadequate conveyance of drainage along Airfield Lane near the Terminal Building is unknown. However, it is recommended that repair and/or reconstruction of these drainage features be included in the next Airport improvement project.

In general, all drainage ditches, culverts, inlets, and storm sewer should be properly sized to convey the 100-year storm event flows for the drainage element's sub-basin area. Gradual side slopes and concrete pilot channels should be used in open ditches to reduce the risk for erosion and enable maintenance between storm events. Frequent maintenance is necessary to preserve positive storm water flows by mowing vegetation in ditches and removing any sediment or debris from inlets, storm sewer, and culverts.

10.0 WILDLIFE HAZARDS

According to the FAA, wildlife strikes have increased from 1,850 in 1990 to record numbers well over 13,000 in the last five years. Official databases have collected over 200,000 reports in the last 30 years, with an estimated number of 39 daily cases as of 2020. Statistics have led to the creation of Advisory Circulars that address the safety hazard and need to control fauna at airport facilities. AC 150/5200-33C, *Hazardous Wildlife Attractants on or near Airports*, identifies certain land uses that have shown, based on extensive research, to attract hazardous wildlife.

The FAA highlights that water management facilities and wetlands are among the land uses with highest potential to attract fauna. The location of these facilities is important and can have an impact on risk. The FAA indicates that water features that are 10,000 feet or less of a runway are more prone to wildlife strikes. Empirical data shows that along with location, other factors such as size, shape, canopy cover, and vegetative composition, can make features more attractive to certain species. This presents a challenge for the Pearland Regional Airport since storm water from impervious cover must be properly detained in accordance with local regulations and detaining this water more than 10,000 feet away from the Runway 14-32 is not feasible.

The Airport Cooperative Research Program (ACRP) addresses the issue in Report 125, *Balancing Airport Stormwater and Bird Hazard Management.* The study provides a risk factor guide to the importance of certain considerations regarding stormwater handling measures. The study indicates that direct impervious runoff to pervious areas and vegetated swales are among the riskiest features, aside from detention basins. Several key considerations are discussed as follows:

1. Vegetation: studies suggest that stormwater ponds can contribute to biodiversity on a regional scale and provide crucial landscape connectivity (Le Viol et al. 2009). In general, pervious pond bottoms increase water quality and allow for infiltration, rendering the area more suitable for unwanted species. Uneven areas with a high water to vegetation ratio are also known to be more attractive to fauna.

2. Exposure of water: exposed surfaces that tend to pond frequently increase wildlife risk. Surface obstructions such as wire and bird ball have been known to mitigate risk.

3. Perimeter shape: higher risks are associated with irregular length/width ratios, as well as shallower features (4:1 or flatter), making marshes particularly undesirable.

The existing conditions at the Airport mirror the high-risk factors identified by the FAA and ACRP. The current detention facilities are located within the median areas between the runway and parallel taxiway. The existing detention ponds are located well within the FAA's separation recommendation of 10,000 feet or more. Additionally, on-site observations indicate that the current condition of the existing ponds exhibit characteristics that are significant wildlife attractants. The ponds have steep side slopes with abrupt grade changes caused by erosion from heavy rainfall events and the lack of bank stabilization. These steep side slopes and slope erosion impede the Airport's ability to properly maintain these ponds which allow for tall vegetation growth and the creation of marshland conditions. **Figure 1** illustrates the Airport's current detention pond conditions.

Figure 1. Erosion of the banks of the existing detention ponds.

Inadequate drainage infrastructure on the Airport also causes water to remain in the drainage channels and detention ponds long past the rain event. This water stagnates and effectively converts the detention ponds to retention ponds. Ponding or stagnant water, as identified by the FAA and ACRP, allows for infiltration which encourages vegetation growth, makes it more difficult to maintain the ditches and ponds, and results in habitat that attracts undesirable wildlife that poses a safety hazard to aircraft. **Figure 2** illustrates the retainage of water within one of the existing ponds.

Figure 2. Ponding water in the existing ponds and ditches.

The previously described conditions have created an ecosystem desirable to wildlife, and numerous reports have indicated the presence of waterfowl on the runway, taxiways, and around other Airport facilities. The number of waterfowl that can be found on the Airport at any given time raises concern about the increased risk of when a wildlife strike may occur which could lead to costly damage and/or loss of life. Examples of these wildlife hazards on the Airport are shown in **Figures 3 and 4**.

It is recommended that corrective measures are taken to reduce the high-risk factors that hazardous wildlife. These corrective measures should include the following:

1. Execute the detention recommendations provided in this report: The proper sizing and design of existing and proposed Airport detention ponds will eliminate many of the high-risk factors currently present in the existing detention ponds. An updated design will provide proper grading to allow storm water to flow off the Airport within 48 hours as recommended by the FAA.

2. Enable proper maintenance of drainage and detention facilities: More gradual slopes along the banks of the detention ponds and/or additional bank stabilization will minimize erosion and allow access for maintenance of the drainage infrastructure. Maintenance should include frequent mowing to eliminate desirable wildlife habitat and cleaning of discharge pipes of sediment and debris to avoid water ponding.

3. Incorporate concrete pilot channels in the Airport's drainage infrastructure: The topography of the Airport is generally flat and slopes on the drainage ditches and detention pond are often near zero. Incorporating concrete pilot channels into the design of drainage ditches

and detention ponds help to maintain a positive slope at the bottom of these features which prevents ponding water and allows for maintenance between storm events.

4. Ensure proper function of localized drainage infrastructure: While the detention pond is likely the primary wildlife attractant on the Airport, localized drainage problems with storm sewer inlets and culverts can cause distributed ponding water and other conditions that can attract hazardous wildlife. Ensure these facilities are properly sized, frequently maintained, and serving their role in conveying storm water to regional facilities and waterways.

If wildlife hazards continue even after these recommendations are employed, additional wildlife management may be required in accordance with FAA regulations. A separate Wildlife Hazard Assessment, if required, would identify additional strategies beyond drainage improvements for wildlife management on the Airport.

Figure 3. Example of wildlife hazard. (Photo provided by the Airport.)

Figure 4. Example of wildlife hazard. (Photo provided by the Airport.)

11.0 SUMMARY AND CONCLUSIONS

Pearland Regional Airport intends to ultimately develop approximately 144 acres that will consist of buildings, apron, roads, parking, taxiways, runway extensions, office space, residential development, and potential other development. Interim and ultimate detention plans were designed in a way to preserve valuable property for future development.

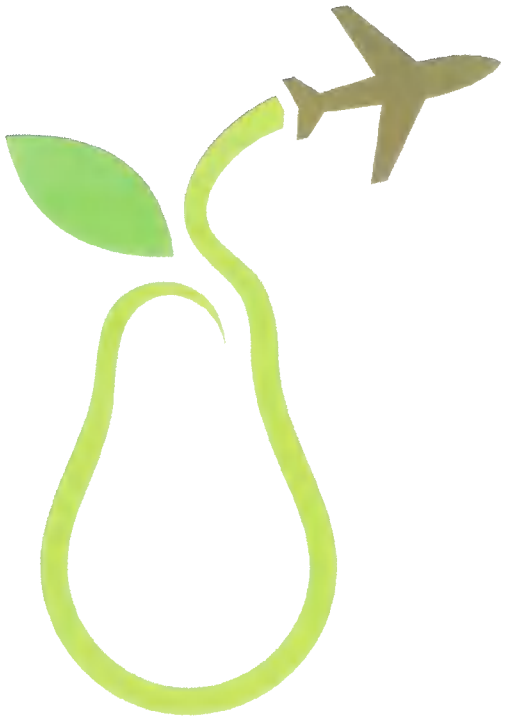
The proposed interim detention plan determined detention capacity available and outlines development areas and impervious cover that is assumed to be developed in the near-term based on discussions with the Airport. From the determined interim detention capacity, increase in storm water runoff from the proposed impervious cover as shown in **Exhibit 7** can be mitigated to release flows into Cowart Creek at a rate less than the existing condition rates. **Exhibit 11** shows the location and general size of the ponds recommended for the interim condition.

Once the capacities of these interim ponds have been reached, it will become necessary to execute the detention plan for the ultimate buildout conditions prior to any further development that may impact the storm water runoff from the Airport property. The proposed detention plan for ultimate buildout conditions detains excess runoff created by future development as shown in **Exhibit 9** and releases flows into Cowart Creek at a rate less than the pre-development rates. The flows are released at the same outlet points as in existing conditions, and **Exhibit 12** shows the location and general size of the ponds recommended for the ultimate condition. This proposed detention layout generally conforms to the "Master Plan Concept" in the Airport Master Plan.

The proposed detention plans for interim and ultimate buildout conditions will require additional storm culverts and upsizing/repositioning the flow lines of existing culverts that serve as the pond outfalls. Additional detention, if needed, can also be available in the existing ditches southwest of the runway and existing taxiway. It is recommended that detention capacities, once built, be tracked for their utilization as impervious cover on the Airport is developed. This tracking table must be maintained by the design engineer of the detention ponds and each development that utilizes detention capacity at the Airport. BDD#4 requires that a ledger be maintained for all detention facilities which are regional in nature. The ledger must reflect all detention credits and debits for the overall development. An updated ledger must be provided for any plan for future work as a pre-requisite for District approval. Tracking detention capacity utilization will enable easier permitting by the relevant review authorities responsible for ensuring adequate detention is provided for all new development.

In addition to the analysis of detention options that will serve future development at the Airport, this report also provides recommendations for the correction and improvement of localized drainage elements and strategies for the reduction in wildlife hazards. Proper design and maintenance of the detention ponds and conveyance systems are critical to providing a functional drainage system that provides safe and uninterrupted operation of the Pearland Regional Airport.

APPENDIX A



Appendix A

Calculations

Project: TAP006
Description: BDD #4 Criteria

Existing:

DA	AREA (AC)	SURFACE TYPE	D (FT)	V (FT/S)	D / (60*V)	Ti (MIN)	Tc (MIN)
DA-1	22.44	Grass	632.22	0.50	21.07	10.00	37.35
		Ditch / Channel	940.77	2.50	6.27		
DA-2	4.11	Paved Area	54.53	1.50	0.61	10.00	16.74
		Grass	21.79	0.50	0.73		
		Ditch / Channel	811.40	2.50	5.41		
DA-3	10.42	Grass	90.82	0.35	4.32	15.00	29.63
		Ditch / Channel	1236.39	2.00	10.30		
DA-4	10.62	Grass	78.95	0.35	3.76	10.00	23.29
		Ditch / Channel	442.58	2.00	3.69		
		Ditch / Channel	876.58	2.50	5.84		
DA-5	0.74	Grass	111.35	0.35	5.30	15.00	21.96
		Ditch / Channel	198.74	2.00	1.66		
DA-6	52.03	Grass	1464.85	0.35	69.75	10.00	101.19
		Ditch / Channel	1333.37	2.00	11.11		
		Ditch / Channel	1549.22	2.50	10.33		
DA-7	30.23	Grass	756.54	0.35	36.03	15.00	60.96
		Ditch / Channel	1084.42	2.00	9.04		
		Storm Sewer	161.82	3.00	0.90		
DA-8	41.85	Grass	559.06	0.35	26.62	15.00	61.20
		Ditch / Channel	393.19	2.00	3.28		
		Ditch / Channel	958.08	2.50	6.39		
		Ditch / Channel	1081.75	2.00	9.01		
		Storm Sewer	161.20	3.00	0.90		
DA-9	9.22	Paved Area	116.88	1.50	1.30	10.00	16.86
		Ditch / Channel	834.73	2.50	5.56		
DA-10	8.12	Grass	272.94	0.50	9.10	10.00	24.11
		Ditch / Channel	751.65	2.50	5.01		
DA-11	8.61	Paved Area	48.84	1.50	0.54	10.00	16.99
		Ditch / Channel	967.63	2.50	6.45		
DA-12	1.83	Grass	29.30	0.50	0.98	10.00	15.76
		Ditch / Channel	718.07	2.50	4.79		
DA-13	0.82	Paved Area	64.49	1.50	0.72	10.00	13.55
		Grass	85.03	0.50	2.83		
DA-14	3.31	Paved Area	57.53	1.50	0.64	10.00	14.14
		Ditch / Channel	525.28	2.50	3.50		
DA-15	8.80	Paved Area	70.38	1.50	0.78	10.00	16.76
		Ditch / Channel	896.40	2.50	5.98		
DA-16	5.08	Paved Area	54.50	1.50	0.61	10.00	15.57
		Ditch / Channel	744.81	2.50	4.97		
DA-17	5.56	Paved Area	49.15	1.50	0.55	10.00	16.11
		Ditch / Channel	834.73	2.50	5.56		
DA-18	0.98	Paved Area	67.28	1.50	0.75	10.00	11.40
		Ditch / Channel	98.34	2.50	0.66		
DA-19	5.49	Grass	190.61	0.35	9.08	15.00	28.76
		Ditch / Channel	561.94	2.00	4.68		
DA-20	17.10	Paved Area	40.08	1.50	0.45	10.00	23.12
		Ditch / Channel	1900.78	2.50	12.67		
DA-21	66.83	Grass	175.19	0.35	8.34	15.00	28.47
		Ditch / Channel	615.18	2.00	5.13		

Approved: September 14, 2021

BRAZORIA DRAINAGE DISTRICT 4

Plat/Plan approval is valid after 365 days

APPENDIX B

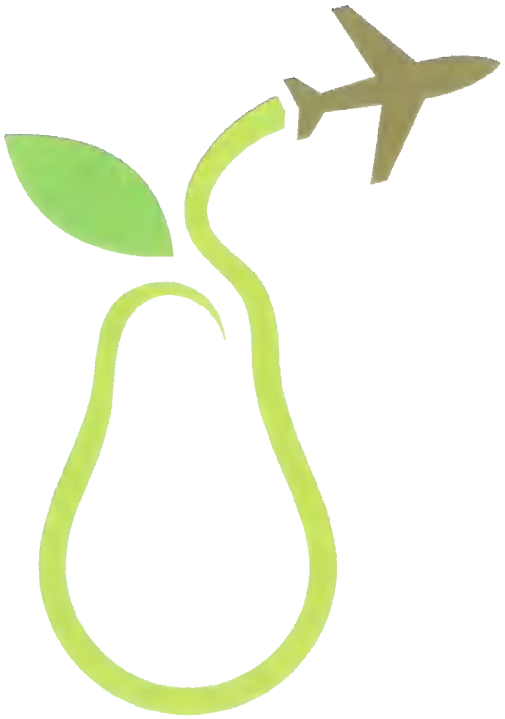


Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

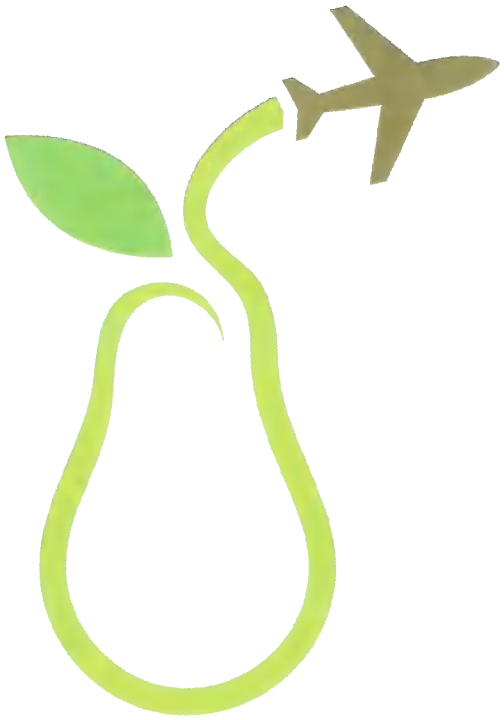
[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

APPENDIX C

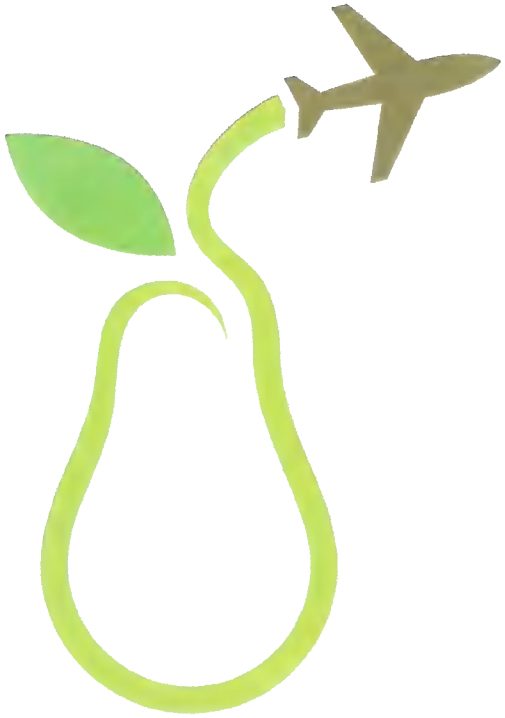


KSA

Appendix C

DA	DA Area	Land Use Area	Land Use	Soil	CN	CN Percentage
DA01	977299.9730	74453.3987	Paved parking lots, roofs, driveways	D	98	7.4659
DA01	977299.9730	902846.5743	Good condition (grass cover > 75%)	D	80	73.9054
DA02	179040.8408	17478.8688	Paved parking lots, roofs, driveways	D	98	9.5673
DA02	179040.8408	161561.9720	Good condition (grass cover > 75%)	D	80	72.1900
DA03	453688.0590	453688.0590	Good condition (grass cover > 75%)	D	80	80.0000
DA04	462504.7391	96099.1657	Paved parking lots, roofs, driveways	D	98	20.3624
DA04	462504.7391	366405.5734	Good condition (grass cover > 75%)	D	80	63.3776
DA05	32397.0426	6958.9463	Paved parking lots, roofs, driveways	D	98	21.0506
DA05	32397.0426	25438.0963	Good condition (grass cover > 75%)	D	80	62.8158
DA06	2266260.0000	162111.8024	Paved parking lots, roofs, driveways	D	98	7.0102
DA06	2266260.0000	2104148.1976	Good condition (grass cover > 75%)	D	80	74.2774
DA07	1316690.0000	62034.9355	Paved parking lots, roofs, driveways	D	98	4.6172
DA07	1316690.0000	1254655.0645	Good condition (grass cover > 75%)	D	80	76.2309
DA08	1822970.0000	123413.8556	Paved parking lots, roofs, driveways	D	98	6.6345
DA08	1822970.0000	1699556.1444	Good condition (grass cover > 75%)	D	80	74.5841
DA09	401659.3602	222083.6711	Paved parking lots, roofs, driveways	D	98	54.1857
DA09	401659.3602	179575.6891	Good condition (grass cover > 75%)	D	80	35.7668
DA10	353921.6038	139082.3888	Paved parking lots, roofs, driveways	D	98	38.5116
DA10	353921.6038	214839.2149	Good condition (grass cover > 75%)	D	80	48.5620
DA11	375103.5802	137479.0769	Paved parking lots, roofs, driveways	D	98	35.9179
DA11	375103.5802	237624.5033	Good condition (grass cover > 75%)	D	80	50.6792
DA12	79583.8083	9321.0491	Paved parking lots, roofs, driveways	D	98	11.4780
DA12	79583.8083	70262.7592	Good condition (grass cover > 75%)	D	80	70.6302
DA13	35812.8688	17328.9771	Paved parking lots, roofs, driveways	D	98	47.4198
DA13	35812.8688	18483.8916	Good condition (grass cover > 75%)	D	80	41.2899
DA14	144062.6448	36478.2392	Paved parking lots, roofs, driveways	D	98	24.8147
DA14	144062.6448	107584.4056	Good condition (grass cover > 75%)	D	80	59.7431
DA15	383261.6834	90903.4516	Paved parking lots, roofs, driveways	D	98	23.2440
DA15	383261.6834	292358.2317	Good condition (grass cover > 75%)	D	80	61.0253
DA16	221419.3146	61093.3190	Paved parking lots, roofs, driveways	D	98	27.0399
DA16	221419.3146	160325.9956	Good condition (grass cover > 75%)	D	80	57.9267
DA17	242038.2711	61812.6468	Paved parking lots, roofs, driveways	D	98	25.0276
DA17	242038.2711	180225.6243	Good condition (grass cover > 75%)	D	80	59.5693
DA18	42884.2480	21888.9189	Paved parking lots, roofs, driveways	D	98	50.0210
DA18	42884.2480	20995.3291	Good condition (grass cover > 75%)	D	80	39.1665
DA19	238999.3415	32286.7716	Paved parking lots, roofs, driveways	D	98	13.2390
DA19	238999.3415	206712.5698	Good condition (grass cover > 75%)	D	80	69.1927
DA20	744844.1669	489460.5116	Paved parking lots, roofs, driveways	D	98	64.3989
DA20	744844.1669	255383.6553	Good condition (grass cover > 75%)	D	80	27.4295
DA21	2910960.0000	476128.1589	Paved parking lots, roofs, driveways	D	98	16.0293
DA21	2910960.0000	2434831.8411	Good condition (grass cover > 75%)	D	80	66.9149
DA22	3471830.0000	3471830.0000	Good condition (grass cover > 75%)	D	80	80.0000
DA23	1317090.0000	4599.9642	Paved parking lots, roofs, driveways	D	98	0.3423
DA23	1317090.0000	1312490.0358	Good condition (grass cover > 75%)	D	80	79.7206

APPENDIX D



Appendix D

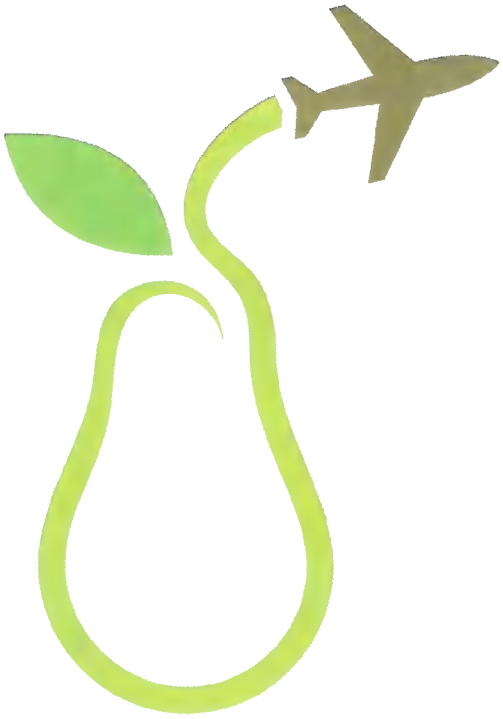
Calculations

Project: TAP006
Description: BDD #4 Criteria

Interim:

DA	AREA (AC)	SURFACE TYPE	D (FT)	V (FT/S)	D / (60*V)	Ti (MIN)	Tc (MIN)
DA-1	22.02	Grass	632.22	0.50	21.07	10.00	37.35
		Ditch / Channel	940.77	2.50	6.27		
DA-2	4.11	Paved Area	54.53	1.50	0.61	10.00	16.74
		Grass	21.79	0.50	0.73		
		Ditch / Channel	811.40	2.50	5.41		
DA-3	10.42	Grass	90.82	0.35	4.32	15.00	29.63
		Ditch / Channel	1236.39	2.00	10.30		
DA-4	10.62	Grass	78.95	0.35	3.76	10.00	23.29
		Ditch / Channel	442.58	2.00	3.69		
		Ditch / Channel	876.58	2.50	5.84		
DA-5	0.74	Grass	111.35	0.35	5.30	15.00	21.96
		Ditch / Channel	198.74	2.00	1.66		
DA-6	77.36	Paved Area	2224.74	1.50	24.72	10.00	39.13
		Ditch / Channel	527.29	2.50	3.52		
		Storm Sewer	161.20	3.00	0.90		
DA-7	16.70	Grass	857.06	0.35	40.81	15.00	66.67
		Ditch / Channel	1629.22	2.50	10.86		
DA-8	30.65	Grass	756.54	0.35	36.03	15.00	60.96
		Ditch / Channel	1084.42	2.00	9.04		
		Storm Sewer	161.82	3.00	0.90		
DA-9	9.22	Paved Area	116.88	1.50	1.30	10.00	16.86
		Ditch / Channel	834.73	2.50	5.56		
DA-10	8.12	Grass	272.94	0.50	9.10	10.00	24.11
		Ditch / Channel	751.65	2.50	5.01		
DA-11	8.61	Paved Area	48.84	1.50	0.54	10.00	16.99
		Ditch / Channel	967.63	2.50	6.45		
DA-12	1.83	Grass	29.30	0.50	0.98	10.00	15.76
		Ditch / Channel	718.07	2.50	4.79		
DA-13	0.82	Paved Area	64.49	1.50	0.72	10.00	13.55
		Grass	85.03	0.50	2.83		
DA-14	3.31	Paved Area	57.53	1.50	0.64	10.00	14.14
		Ditch / Channel	525.28	2.50	3.50		
DA-15	8.80	Paved Area	70.38	1.50	0.78	10.00	16.76
		Ditch / Channel	896.40	2.50	5.98		
DA-16	5.08	Paved Area	54.50	1.50	0.61	10.00	15.57
		Ditch / Channel	744.81	2.50	4.97		
DA-17	5.56	Paved Area	49.15	1.50	0.55	10.00	16.11
		Ditch / Channel	834.73	2.50	5.56		
DA-18	0.98	Paved Area	67.28	1.50	0.75	10.00	11.40
		Ditch / Channel	98.34	2.50	0.66		
DA-19	5.49	Grass	190.61	0.35	9.08	15.00	28.76
		Ditch / Channel	561.94	2.00	4.68		
DA-20	17.10	Paved Area	40.08	1.50	0.45	10.00	23.12
		Ditch / Channel	1900.78	2.50	12.67		
DA-21	66.83	Grass	175.19	0.35	8.34	15.00	28.47
		Ditch / Channel	615.18	2.00	5.13		

APPENDIX E

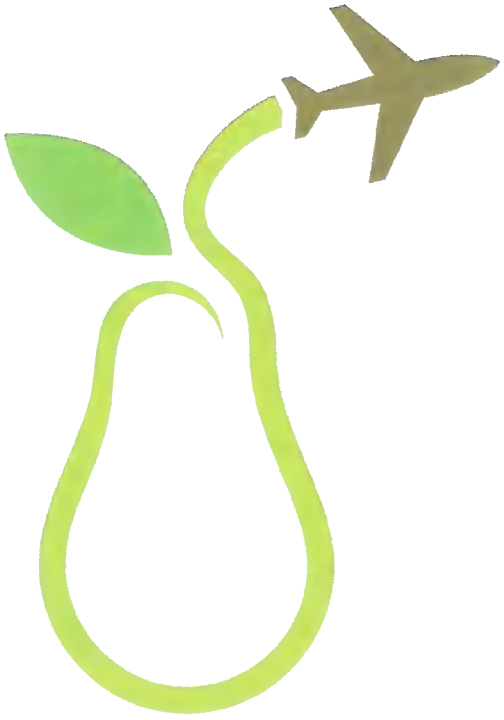


KSA

Appendix E

DA	DA Area	Land Use Area	Land Use	Soil	CN	CN Percentage
DA01	958992.4036	345538.4245	Paved parking lots, roofs, driveways	D	98	35.3108
DA01	958992.4036	613453.9791	Good condition (grass cover > 75%)	D	80	51.1749
DA02	179040.8408	17478.8688	Paved parking lots, roofs, driveways	D	98	9.5673
DA02	179040.8408	161561.9720	Good condition (grass cover > 75%)	D	80	72.1900
DA03	453688.0590	453688.0590	Good condition (grass cover > 75%)	D	80	80.0000
DA04	462504.7391	96099.1657	Paved parking lots, roofs, driveways	D	98	20.3624
DA04	462504.7391	366405.5734	Good condition (grass cover > 75%)	D	80	63.3776
DA05	32397.0426	6958.9463	Paved parking lots, roofs, driveways	D	98	21.0506
DA05	32397.0426	2530.9197	1/8 acre or less (town house)	D	92	7.1872
DA05	32397.0426	22907.1766	Good condition (grass cover > 75%)	D	80	56.5661
DA06	3369770.0000	2306960.4624	1/8 acre or less (town house)	D	92	62.9836
DA06	3369770.0000	263676.5741	Paved parking lots, roofs, driveways	D	98	7.6683
DA06	3369770.0000	799132.9635	Good condition (grass cover > 75%)	D	80	18.9718
DA07	727255.9357	120578.7451	Paved parking lots, roofs, driveways	D	98	16.2484
DA07	727255.9357	606677.1906	Good condition (grass cover > 75%)	D	80	66.7360
DA08	1334914.1464	389193.7896	Paved parking lots, roofs, driveways	D	98	28.5719
DA08	1334914.1464	945720.3568	Good condition (grass cover > 75%)	D	80	56.6760
DA09	401659.3602	222083.6711	Paved parking lots, roofs, driveways	D	98	54.1857
DA09	401659.3602	179575.6891	Good condition (grass cover > 75%)	D	80	35.7668
DA10	353921.6038	139082.3888	Paved parking lots, roofs, driveways	D	98	38.5116
DA10	353921.6038	214839.2149	Good condition (grass cover > 75%)	D	80	48.5620
DA11	375103.5802	137479.0769	Paved parking lots, roofs, driveways	D	98	35.9179
DA11	375103.5802	237624.5033	Good condition (grass cover > 75%)	D	80	50.6792
DA12	79583.8083	9321.0491	Paved parking lots, roofs, driveways	D	98	11.4780
DA12	79583.8083	70262.7592	Good condition (grass cover > 75%)	D	80	70.6302
DA13	35812.8688	17328.9771	Paved parking lots, roofs, driveways	D	98	47.4198
DA13	35812.8688	18483.8916	Good condition (grass cover > 75%)	D	80	41.2899
DA14	144062.6448	36478.2392	Paved parking lots, roofs, driveways	D	98	24.8147
DA14	144062.6448	107584.4056	Good condition (grass cover > 75%)	D	80	59.7431
DA15	383261.6834	90903.4516	Paved parking lots, roofs, driveways	D	98	23.2440
DA15	383261.6834	292358.2317	Good condition (grass cover > 75%)	D	80	61.0253
DA16	221419.3146	61093.3190	Paved parking lots, roofs, driveways	D	98	27.0399
DA16	221419.3146	160325.9956	Good condition (grass cover > 75%)	D	80	57.9267
DA17	242038.2711	61812.6468	Paved parking lots, roofs, driveways	D	98	25.0276
DA17	242038.2711	180225.6243	Good condition (grass cover > 75%)	D	80	59.5693
DA18	42884.2480	21888.9189	Paved parking lots, roofs, driveways	D	98	50.0210
DA18	42884.2480	20995.3291	Good condition (grass cover > 75%)	D	80	39.1665
DA19	238999.3415	32286.7716	Paved parking lots, roofs, driveways	D	98	13.2390
DA19	238999.3415	206712.5698	Good condition (grass cover > 75%)	D	80	69.1927
DA20	744844.1669	551539.4142	Paved parking lots, roofs, driveways	D	98	72.5667
DA20	744844.1669	193304.7527	Good condition (grass cover > 75%)	D	80	20.7619
DA21	2910960.0000	633441.1115	Paved parking lots, roofs, driveways	D	98	21.3253
DA21	2910960.0000	2277518.8885	Good condition (grass cover > 75%)	D	80	62.5916
DA22	3471830.0000	3471830.0000	Good condition (grass cover > 75%)	D	80	80.0000
DA23	1317090.0000	4599.9642	Paved parking lots, roofs, driveways	D	98	0.3423
DA23	1317090.0000	1312490.0358	Good condition (grass cover > 75%)	D	80	79.7206

APPENDIX F



Appendix F

Calculations
Project: TAP006
Description: BDD #4 Criteria

Ultimate:

DA	AREA (AC)	SURFACE TYPE	D (FT)	V (FT/S)	D / (60*V)	Ti (MIN)	Tc (MIN)
DA-1	14.28	Grass	1006.24	0.50	33.54	10.00	43.54
DA-2	4.11	Paved Area	54.53	1.50	0.61	10.00	16.74
		Grass	21.79	0.50	0.73		
		Ditch / Channel	811.40	2.50	5.41		
DA-3	8.86	Paved Area	931.23	1.50	10.35	10.00	22.86
		Ditch / Channel	377.38	2.50	2.52		
DA-4	10.77	Grass	80.11	0.50	2.67	10.00	21.00
		Ditch / Channel	372.36	2.50	2.48		
		Ditch / Channel	876.58	2.50	5.84		
DA-5	0.69	Grass	57.34	0.50	1.91	10.00	13.10
		Ditch / Channel	178.90	2.50	1.19		
DA-6	52.08	Paved Area	2243.88	1.50	24.93	10.00	34.93
DA-7	16.70	Paved Area	857.06	1.50	9.52	10.00	30.38
		Ditch / Channel	1629.22	2.50	10.86		
DA-8	11.22	Grass	868.01	0.50	28.93	10.00	41.21
		Ditch / Channel	341.10	2.50	2.27		
DA-9	13.34	Paved Area	262.35	1.50	2.91	10.00	18.07
		Grass	45.44	0.60	1.26		
		Paved Area	294.71	1.50	3.27		
		Ditch / Channel	93.15	2.50	0.62		
DA-10	9.22	Paved Area	116.88	1.50	1.30	10.00	18.08
		Ditch / Channel	1017.28	2.50	6.78		
DA-11	5.54	Grass	243.91	0.50	8.13	10.00	23.33
		Paved Area	34.32	1.50	0.38		
		Ditch / Channel	723.03	2.50	4.82		
DA-12	5.34	Paved Area	48.84	1.50	0.54	10.00	16.13
		Ditch / Channel	837.40	2.50	5.58		
DA-13	1.75	Grass	29.30	0.50	0.98	10.00	15.76
		Ditch / Channel	718.07	2.50	4.79		
DA-14	8.03	Grass	116.25	0.50	3.88	10.00	20.14
		Ditch / Channel	939.84	2.50	6.27		
DA-15	16.04	Grass	69.52	0.50	2.32	10.00	16.68
		Ditch / Channel	655.05	2.50	4.37		
DA-16	3.93	Grass	188.50	0.50	6.28	10.00	18.48
		Ditch / Channel	329.59	2.50	2.20		
DA-17	2.40	Grass	127.60	0.50	4.25	10.00	15.82
		Ditch / Channel	234.37	2.50	1.56		
DA-18	3.38	Grass	154.80	0.50	5.16	10.00	18.35
		Ditch / Channel	479.08	2.50	3.19		
DA-19	5.77	Grass	278.07	0.50	9.27	10.00	28.41
		Ditch / Channel	1371.27	2.50	9.14		
DA-20	2.48	Paved Area	42.17	1.50	0.47	10.00	13.47
		Ditch / Channel	449.74	2.50	3.00		
DA-21	11.39	Paved Area	54.50	1.50	0.61	10.00	22.58
		Ditch / Channel	1796.15	2.50	11.97		
DA-22	5.56	Paved Area	49.15	1.50	0.55	10.00	16.11
		Ditch / Channel	834.73	2.50	5.56		
DA-23	30.24	Paved Area	62.60	1.50	0.70	10.00	25.70
		Grass	450.12	0.50	15.00		
DA-24	17.06	Paved Area	40.48	1.50	0.45	10.00	23.12
		Ditch / Channel	1900.83	2.50	12.67		
DA-25	3.19	Paved Area	183.59	1.50	2.04	10.00	20.54
		Grass	186.15	0.50	6.21		
		Ditch / Channel	344.46	2.50	2.30		
DA-26	40.56	Grass	285.76	0.35	13.61	15.00	29.37
		Ditch / Channel	91.52	2.00	0.76		
DA-27	23.36	Grass	307.96	0.50	10.27	10.00	25.03
		Ditch / Channel	714.38	2.50	4.76		

APPENDIX G

Approved. September 14, 2021

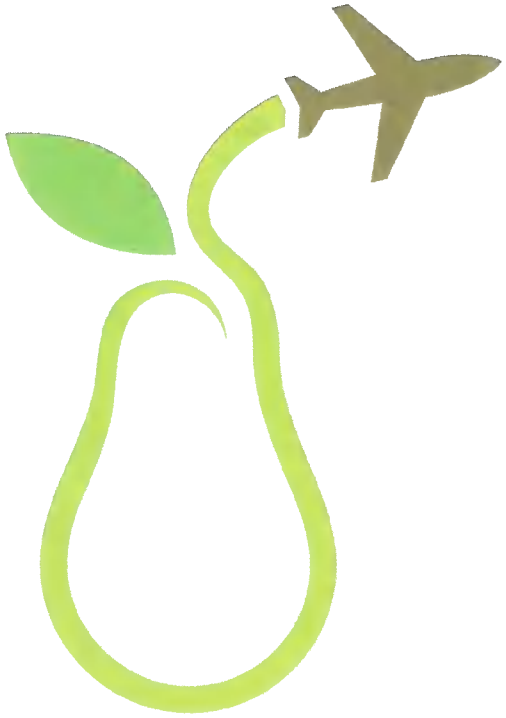
BRAZORIA DRAINAGE DISTRICT
4

Plat/Plan approvals expire after 365 days

Appendix G

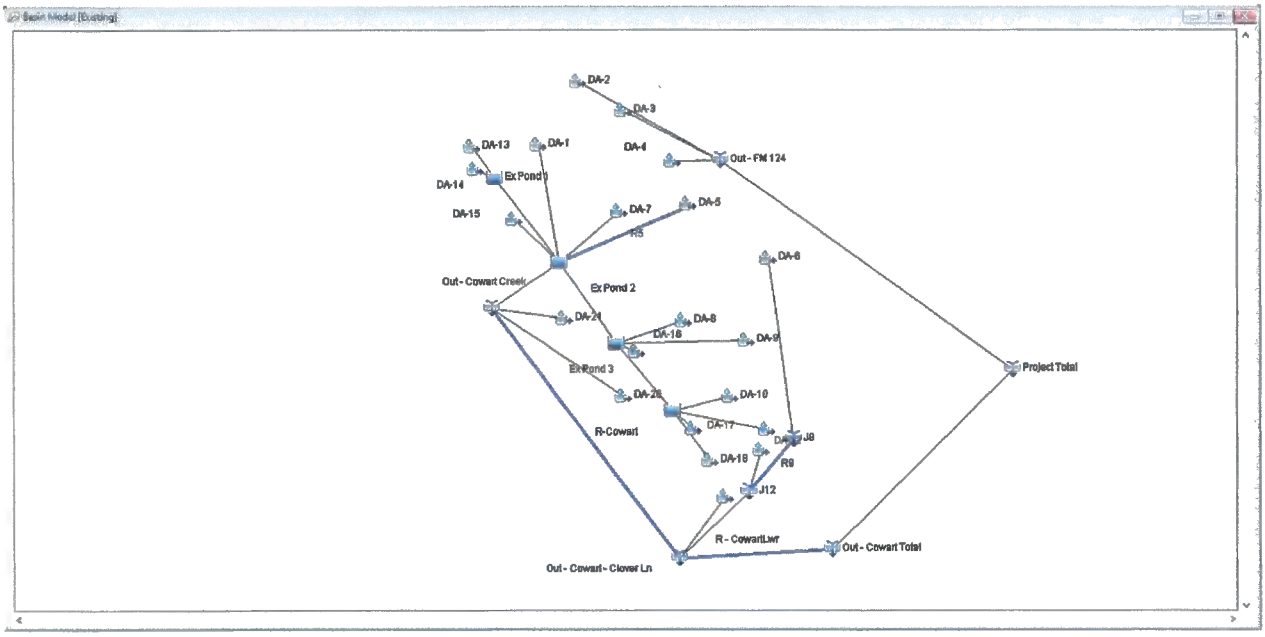
DA	DA Area	Land Use Area	Land Use	Soil	CN	CN Percentage
DA01	621920.3006	17205.7025	Commercial Business	D	95	2.6282
DA01	621920.3006	65326.0748	Paved parking lots, roofs, driveways	D	98	10.2939
DA01	621920.3006	539388.5233	Good condition (grass cover > 75%)	D	80	69.3836
DA02	179040.8408	38026.1932	Commercial Business	D	95	20.1769
DA02	179040.8408	17478.8688	Paved parking lots, roofs, driveways	D	98	9.5673
DA02	179040.8408	123535.7789	Good condition (grass cover > 75%)	D	80	55.1989
DA03	386093.9721	325194.2234	Commercial Business	D	95	80.0154
DA03	386093.9721	10804.7166	Paved parking lots, roofs, driveways	D	98	2.7425
DA03	386093.9721	50095.0320	Good condition (grass cover > 75%)	D	80	10.3799
DA04	469296.5877	105821.5090	Paved parking lots, roofs, driveways	D	98	22.0980
DA04	469296.5877	363475.0787	Good condition (grass cover > 75%)	D	80	61.9608
DA05	29874.0107	11.0508	1/8 acre or less (town house)	D	92	0.0340
DA05	29874.0107	6951.8389	Paved parking lots, roofs, driveways	D	98	22.8051
DA05	29874.0107	22911.1210	Good condition (grass cover > 75%)	D	80	61.3540
DA06	2872680.0000	21898.7200	Commercial Business	D	95	0.7242
DA06	2872680.0000	2309480.0000	1/8 acre or less (town house)	D	92	73.9630
DA06	2872680.0000	119766.8084	Paved parking lots, roofs, driveways	D	98	4.0858
DA06	2872680.0000	421534.4715	Good condition (grass cover > 75%)	D	80	11.7391
DA07	727255.9357	174894.9684	Commercial Business	D	95	22.8462
DA07	727255.9357	88.1253	1/8 acre or less (town house)	D	92	0.0111
DA07	727255.9357	120490.6198	Paved parking lots, roofs, driveways	D	98	16.2365
DA07	727255.9357	431782.2222	Good condition (grass cover > 75%)	D	80	47.4971
DA08	488547.2524	146144.0376	Paved parking lots, roofs, driveways	D	98	29.3157
DA08	488547.2524	342403.2148	Good condition (grass cover > 75%)	D	80	56.0688
DA09	581252.3933	161880.6990	Commercial Business	D	95	26.4578
DA09	581252.3933	222218.8181	Paved parking lots, roofs, driveways	D	98	37.4664
DA09	581252.3933	197152.8761	Good condition (grass cover > 75%)	D	80	27.1349
DA10	401659.3602	222083.6711	Paved parking lots, roofs, driveways	D	98	54.1857
DA10	401659.3602	179575.6891	Good condition (grass cover > 75%)	D	80	35.7668
DA11	241393.5812	123826.3271	Paved parking lots, roofs, driveways	D	98	50.2705
DA11	241393.5812	117567.2541	Good condition (grass cover > 75%)	D	80	38.9628
DA12	232632.4601	153636.2647	Paved parking lots, roofs, driveways	D	98	64.7216
DA12	232632.4601	78996.1954	Good condition (grass cover > 75%)	D	80	27.1660
DA13	76195.2689	13195.5884	Paved parking lots, roofs, driveways	D	98	16.9718
DA13	76195.2689	62999.6805	Good condition (grass cover > 75%)	D	80	66.1455
DA14	349752.9095	92576.7373	Paved parking lots, roofs, driveways	D	98	25.9398
DA14	349752.9095	257176.1722	Good condition (grass cover > 75%)	D	80	58.8247
DA15	698697.0665	142201.2814	Paved parking lots, roofs, driveways	D	98	19.9453
DA15	698697.0665	556495.7851	Good condition (grass cover > 75%)	D	80	63.7181
DA16	171073.8608	40948.0123	Paved parking lots, roofs, driveways	D	98	23.4571
DA16	171073.8608	130125.8485	Good condition (grass cover > 75%)	D	80	60.8513
DA17	104467.5338	31148.7919	Paved parking lots, roofs, driveways	D	98	29.2204
DA17	104467.5338	73318.7419	Good condition (grass cover > 75%)	D	80	56.1466
DA18	147248.0031	40923.3954	Paved parking lots, roofs, driveways	D	98	27.2363
DA18	147248.0031	106324.6078	Good condition (grass cover > 75%)	D	80	57.7663
DA19	251308.1323	57452.7782	Paved parking lots, roofs, driveways	D	98	22.4043
DA19	251308.1323	193855.3542	Good condition (grass cover > 75%)	D	80	61.7108
DA20	108133.8816	28255.4397	Paved parking lots, roofs, driveways	D	98	25.6075
DA20	108133.8816	79878.4419	Good condition (grass cover > 75%)	D	80	59.0960
DA21	496347.1544	117041.0411	Paved parking lots, roofs, driveways	D	98	23.1089
DA21	496347.1544	379306.1133	Good condition (grass cover > 75%)	D	80	61.1356
DA22	242038.2711	61812.6468	Paved parking lots, roofs, driveways	D	98	25.0276
DA22	242038.2711	180225.6243	Good condition (grass cover > 75%)	D	80	59.5693
DA23	140931.8169	41371.5444	Paved parking lots, roofs, driveways	D	98	28.7686
DA23	140931.8169	99560.2725	Good condition (grass cover > 75%)	D	80	56.5154
DA24	743143.7432	549703.1754	Paved parking lots, roofs, driveways	D	98	72.4906
DA24	743143.7432	193440.5678	Good condition (grass cover > 75%)	D	80	20.8240
DA25	139002.9575	39354.1518	Paved parking lots, roofs, driveways	D	98	27.7455
DA25	139002.9575	99648.8057	Good condition (grass cover > 75%)	D	80	57.3506
DA26	1766670.0000	272901.2009	Paved parking lots, roofs, driveways	D	98	15.1383
DA26	1766670.0000	1493768.7991	Good condition (grass cover > 75%)	D	80	67.6422
DA27	1017720.0000	384482.8759	Paved parking lots, roofs, driveways	D	98	37.0233
DA27	1017720.0000	633237.1241	Good condition (grass cover > 75%)	D	80	49.7769

APPENDIX H

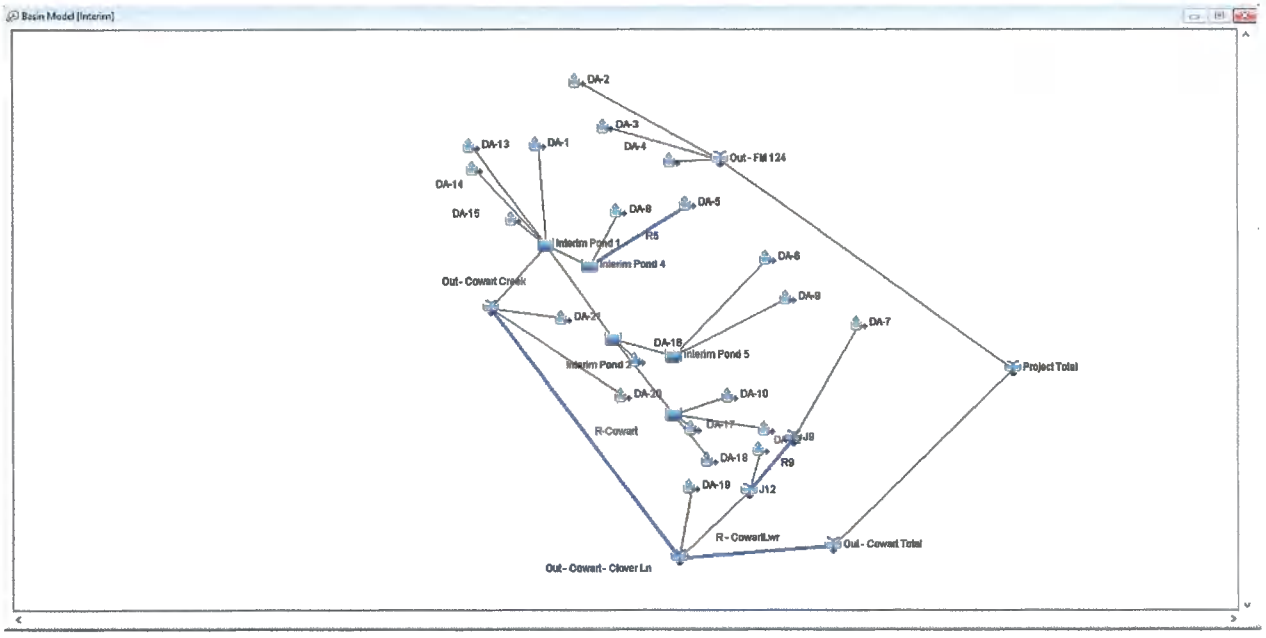


Appendix H HMS Schematic

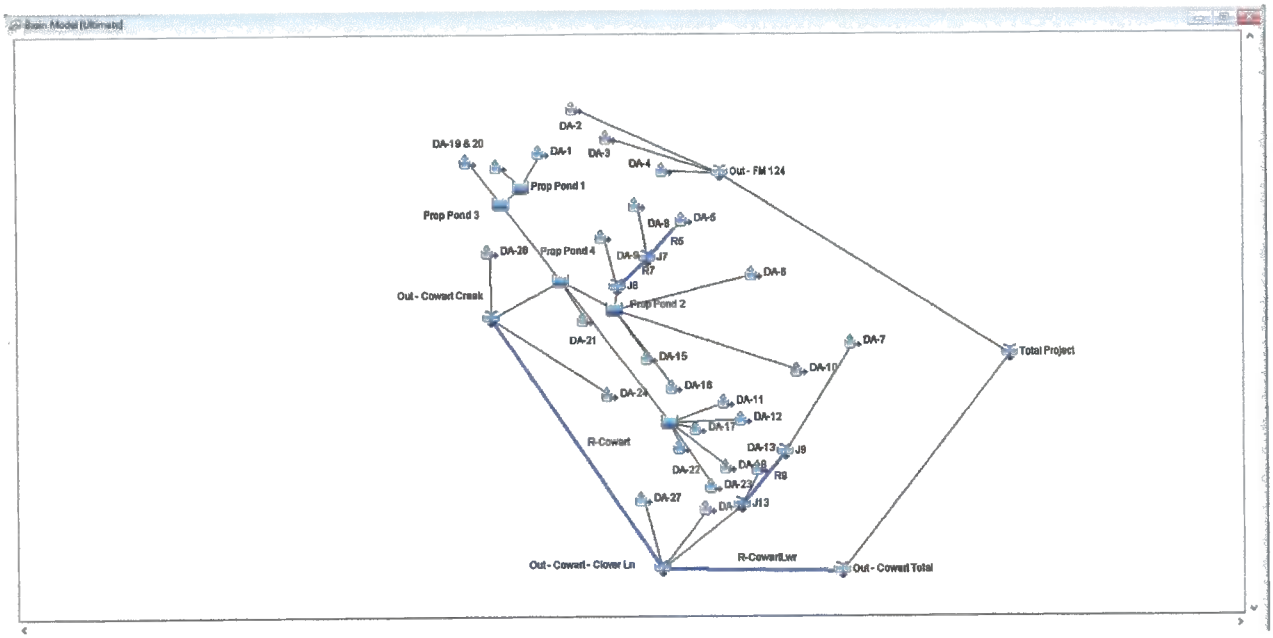
Existing



Interim



Ultimate



KSA

APPENDIX I

Appendix I HEC-HMS Results

EX 3-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0350625	39.8	5.3
	DA-2	0.0064219	10.2	1
	DA-3	0.0162813	19.6	2.4
	DA-4	0.0165938	24.9	2.7
	DA-5	0.0011562	1.8	0.2
	DA-6	0.0812969	52.3	12.3
	DA-7	0.0472344	41	7.1
	DA-8	0.0653906	57.3	9.9
	DA-9	0.0144063	28.4	2.8
	DA-10	0.0126875	20.5	2.3
	DA-11	0.0134531	24.5	2.4
	DA-12	0.0028594	4.7	0.4
	DA-13	0.0012813	2.6	0.2
	DA-14	0.0051719	9.4	0.9
	DA-15	0.01375	23.6	2.3
	DA-16	0.0079375	14.2	1.3
	DA-17	0.0086875	15.2	1.5
	DA-18	0.0015313	3.3	0.3
	DA-19	0.0085781	11.3	1.3
	DA-20	0.0267187	48.9	5.5
	DA-21	0.10442	140.7	16.6
	Ex Pond 1	0.0064532	9.7	1.1
	Ex Pond 2	0.2277501	128	36.4
	Ex Pond 3	0.1240938	101.8	20.5
	Ex Pond 4	0.0363594	44.9	6.4
	J12	0.0841563	52.8	12.7
	J9	0.0812969	52.3	12.3
	Out - Cowart - Clover Ln	0.4516232	303.6	72.7
	Out - Cowart Creek	0.3588888	271.5	58.6
	Out - Cowart Total	0.4516232	303.6	72.7
	Out - FM 124	0.039297	52.9	6.1
	Project Total	0.4909202	353.9	78.7
	R - CowartLwr	0.4516232	303.6	72.7
	R5	0.0011562	1.5	0.2
	R9	0.0812969	52.2	12.3
	R-Cowart	0.3588888	271.5	58.6

EX 5-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0350625	59.7	8
	DA-2	0.0064219	15.3	1.5
	DA-3	0.0162813	29.8	3.6
	DA-4	0.0165938	36.5	4
	DA-5	0.0011562	2.6	0.3
	DA-6	0.0812969	78.7	18.6
	DA-7	0.0472344	61.9	10.7
	DA-8	0.0653906	86.2	14.9
	DA-9	0.0144063	39.7	4
	DA-10	0.0126875	29.3	3.3
	DA-11	0.0134531	35	3.5
	DA-12	0.0028594	7	0.7
	DA-13	0.0012813	3.7	0.3
	DA-14	0.0051719	13.7	1.3
	DA-15	0.01375	34.4	3.4
	DA-16	0.0079375	20.6	2
	DA-17	0.0086875	22.2	2.2
	DA-18	0.0015313	4.6	0.4
	DA-19	0.0085781	16.8	2
	DA-20	0.0267187	67.5	7.8
	DA-21	0.10442	208.1	24.8
	Ex Pond 1	0.0064532	13.4	1.6
	Ex Pond 2	0.2277501	158.4	54.3
	Ex Pond 3	0.1240938	135	30.3
	Ex Pond 4	0.0363594	61.6	9.4
	J12	0.0841563	79.5	19.2
	J9	0.0812969	78.7	18.6
	Out - Cowart Creek	0.3588888	380.6	86.8
	Out - Cowart Total	0.4516232	430.1	108.1
	Out - Cowart - Clover Ln	0.4516232	430.1	108.1
	Out - FM 124	0.039297	78.9	9.1
	Project Total	0.4909202	506.4	117.2
	R - CowartLwr	0.4516232	430.1	108.1
	R-Cowart	0.3588888	380.6	86.8
	R5	0.0011562	2.3	0.3
	R9	0.0812969	78.7	18.6

EX 10-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0350625	77.4	10.5
	DA-2	0.0064219	19.7	1.9
	DA-3	0.0162813	38.9	4.7
	DA-4	0.0165938	46.7	5.2
	DA-5	0.0011562	3.3	0.4
	DA-6	0.0812969	102.2	24.2
	DA-7	0.0472344	80.4	14
	DA-8	0.0653906	111.8	19.5
	DA-9	0.0144063	49.5	5.1
	DA-10	0.0126875	37	4.2
	DA-11	0.0134531	44.2	4.5
	DA-12	0.0028594	9	0.9
	DA-13	0.0012813	4.6	0.4
	DA-14	0.0051719	17.5	1.6
	DA-15	0.01375	43.9	4.4
	DA-16	0.0079375	26.2	2.5
	DA-17	0.0086875	28.3	2.8
	DA-18	0.0015313	5.8	0.5
	DA-19	0.0085781	21.7	2.6
	DA-20	0.0267187	83.7	9.7
	DA-21	0.10442	267.3	32.2
	Ex Pond 1	0.0064532	16.5	2.1
	Ex Pond 2	0.2277501	178.8	70.3
	Ex Pond 3	0.1240938	157.5	39.1
	Ex Pond 4	0.0363594	75.5	12
	J12	0.0841563	103.2	25.1
	J9	0.0812969	102.2	24.2
	Out - Cowart Creek	0.3588888	469.5	112.2
	Out - Cowart Total	0.4516232	534.8	139.9
	Out - Cowart - Clover Ln	0.4516232	534.8	139.9
	Out - FM 124	0.039297	101.9	11.8
	Project Total	0.4909202	633.6	151.8
	R - CowartLwr	0.4516232	534.8	139.9
	R-Cowart	0.3588888	469.5	112.2
	R5	0.0011562	2.9	0.4
	R9	0.0812969	102.1	24.2

EX 25-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0350625	102.5	14
	DA-2	0.0064219	26	2.6
	DA-3	0.0162813	51.8	6.4
	DA-4	0.0165938	61.3	6.9
	DA-5	0.0011562	4.4	0.5
	DA-6	0.0812969	135.9	32.5
	DA-7	0.0472344	106.9	18.7
	DA-8	0.0653906	148.4	26.1
	DA-9	0.0144063	63.4	6.6
	DA-10	0.0126875	47.9	5.6
	DA-11	0.0134531	57.3	5.9
	DA-12	0.0028594	11.9	1.2
	DA-13	0.0012813	5.9	0.6
	DA-14	0.0051719	22.8	2.2
	DA-15	0.01375	57.4	5.8
	DA-16	0.0079375	34.2	3.4
	DA-17	0.0086875	36.9	3.7
	DA-18	0.0015313	7.4	0.7
	DA-19	0.0085781	28.6	3.5
	DA-20	0.0267187	106.5	12.5
	DA-21	0.10442	351.7	42.9
	Ex Pond 1	0.0064532	20.1	2.8
	Ex Pond 2	0.2277501	199.1	93.6
	Ex Pond 3	0.1240938	181.3	51.8
	Ex Pond 4	0.0363594	94.5	15.8
	J12	0.0841563	137.2	33.6
	J9	0.0812969	135.9	32.5
	Out - Cowart Creek	0.3588888	592.7	149.1
	Out - Cowart Total	0.4516232	680.9	186.2
	Out - Cowart - Clover Ln	0.4516232	680.9	186.2
	Out - FM 124	0.039297	134.7	15.9
	Project Total	0.4909202	811.7	202.1
	R - CowartLwr	0.4516232	680.9	186.2
	R-Cowart	0.3588888	592.7	149.1
	R5	0.0011562	3.8	0.5
	R9	0.0812969	135.8	32.5

EX 100-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0350625	148.8	20.7
	DA-2	0.0064219	37.7	3.8
	DA-3	0.0162813	75.7	9.5
	DA-4	0.0165938	87.9	10.1
	DA-5	0.0011562	6.3	0.7
	DA-6	0.0812969	198	48.1
	DA-7	0.0472344	155.7	27.8
	DA-8	0.0653906	215.8	38.6
	DA-9	0.0144063	88.8	9.4
	DA-10	0.0126875	67.8	8
	DA-11	0.0134531	81.3	8.5
	DA-12	0.0028594	17.1	1.7
	DA-13	0.0012813	8.4	0.8
	DA-14	0.0051719	32.6	3.2
	DA-15	0.01375	82.2	8.4
	DA-16	0.0079375	48.7	4.9
	DA-17	0.0086875	52.7	5.3
	DA-18	0.0015313	10.4	1
	DA-19	0.0085781	41.3	5.1
	DA-20	0.0267187	148.5	17.8
	DA-21	0.10442	506.5	63
	Ex Pond 1	0.0064532	24.5	4
	Ex Pond 2	0.2277501	217.2	137.4
	Ex Pond 3	0.1240938	202.7	75.8
	Ex Pond 4	0.0363594	123.4	22.8
	J12	0.0841563	199.8	49.8
	J9	0.0812969	198	48.1
	Out - Cowart Creek	0.3588888	812.7	218.2
	Out - Cowart Total	0.4516232	943.6	273.1
	Out - Cowart - Clover Ln	0.4516232	943.6	273.1
	Out - FM 124	0.039297	194.9	23.4
	Project Total	0.4909202	1134	296.5
	R - CowartLwr	0.4516232	943.6	273.1
	R-Cowart	0.3588888	812.7	218.2
	R5	0.0011562	5.4	0.7
	R9	0.0812969	197.8	48.1

Interim 3-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0344062	45.4	6.1
	DA-10	0.0126875	20.5	2.3
	DA-11	0.0134531	24.5	2.4
	DA-12	0.0028594	4.7	0.4
	DA-13	0.0012813	2.6	0.2
	DA-14	0.0051719	9.4	0.9
	DA-15	0.01375	23.6	2.3
	DA-16	0.0079375	14.2	1.3
	DA-17	0.0086875	15.2	1.5
	DA-18	0.0015313	3.3	0.3
	DA-19	0.0085781	11.3	1.3
	DA-2	0.0064219	10.2	1
	DA-20	0.0267187	50.3	5.8
	DA-21	0.10442	144.9	17.2
	DA-3	0.0162813	19.6	2.4
	DA-4	0.0165938	24.9	2.7
	DA-5	0.0011562	1.8	0.2
	DA-6	0.120875	168.3	23.5
	DA-7	0.0260937	23	4.2
	DA-8	0.0478906	44.2	7.7
	DA-9	0.0144063	28.4	2.8
	Interim Pond 1	0.2832344	86.3	51.4
	Interim Pond 2	0.1795782	101.3	34.1
	Interim Pond 3	0.0363594	34.7	6.4
	Interim Pond 4	0.0490468	33.2	7.8
	Interim Pond 5	0.1352813	78.4	26.3
	J12	0.0289531	23.9	4.6
	J9	0.0260937	23	4.2
	Out - Cowart Creek	0.4143731	260.7	74.3
	Out - Cowart Total	0.4519043	286.3	80.3
	Out - Cowart - Clover Ln	0.4519043	286.3	80.3
	Out - FM 124	0.039297	52.9	6.1
	Project Total	0.4912013	338.4	86.3
	R - CowartLwr	0.4519043	286.3	80.3
	R-Cowart	0.4143731	260.7	74.3
	R5	0.0011562	1.5	0.2
	R9	0.0260937	22.9	4.2

Interim 5-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0344062	65.1	8.9
	DA-10	0.0126875	29.3	3.3
	DA-11	0.0134531	35	3.5
	DA-12	0.0028594	7	0.7
	DA-13	0.0012813	3.7	0.3
	DA-14	0.0051719	13.7	1.3
	DA-15	0.01375	34.4	3.4
	DA-16	0.0079375	20.6	2
	DA-17	0.0086875	22.2	2.2
	DA-18	0.0015313	4.6	0.4
	DA-19	0.0085781	16.8	2
	DA-2	0.0064219	15.3	1.5
	DA-20	0.0267187	68.8	8
	DA-21	0.10442	212.4	25.4
	DA-3	0.0162813	29.8	3.6
	DA-4	0.0165938	36.5	4
	DA-5	0.0011562	2.6	0.3
	DA-6	0.120875	235.9	33.5
	DA-7	0.0260937	34	6.2
	DA-8	0.0478906	65.3	11.4
	DA-9	0.0144063	39.7	4
	Interim Pond 1	0.2832344	100.8	74.4
	Interim Pond 2	0.1795782	144.2	48.9
	Interim Pond 3	0.0363594	52	9.4
	Interim Pond 4	0.0490468	42.4	11.7
	Interim Pond 5	0.1352813	110.4	37.5
	J12	0.0289531	35.3	6.9
	J9	0.0260937	34	6.2
	Out - Cowart Creek	0.4143731	350.8	107.8
	Out - Cowart Total	0.4519043	389.6	116.7
	Out - Cowart - Clover Ln	0.4519043	389.6	116.7
	Out - FM 124	0.039297	78.9	9.1
	Project Total	0.4912013	467.4	125.8
	R - CowartLwr	0.4519043	389.6	116.7
	R-Cowart	0.4143731	350.8	107.8
	R5	0.0011562	2.3	0.3
	R9	0.0260937	34	6.2

Interim 10-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0344062	82.4	11.4
	DA-10	0.0126875	37	4.2
	DA-11	0.0134531	44.2	4.5
	DA-12	0.0028594	9	0.9
	DA-13	0.0012813	4.6	0.4
	DA-14	0.0051719	17.5	1.6
	DA-15	0.01375	43.9	4.4
	DA-16	0.0079375	26.2	2.5
	DA-17	0.0086875	28.3	2.8
	DA-18	0.0015313	5.8	0.5
	DA-19	0.0085781	21.7	2.6
	DA-2	0.0064219	19.7	1.9
	DA-20	0.0267187	84.8	10
	DA-21	0.10442	271.6	32.8
	DA-3	0.0162813	38.9	4.7
	DA-4	0.0165938	46.7	5.2
	DA-5	0.0011562	3.3	0.4
	DA-6	0.120875	294.6	42.3
	DA-7	0.0260937	43.8	8.1
	DA-8	0.0478906	84	14.8
	DA-9	0.0144063	49.5	5.1
	Interim Pond 1	0.2832344	216.6	94.8
	Interim Pond 2	0.1795782	185	61.9
	Interim Pond 3	0.0363594	68.2	12
	Interim Pond 4	0.0490468	51.6	15.1
	Interim Pond 5	0.1352813	141	47.4
	J12	0.0289531	45.5	8.9
	J9	0.0260937	43.8	8.1
	Out - Cowart Creek	0.4143731	430.1	137.6
	Out - Cowart Total	0.4519043	480.5	149.2
	Out - Cowart - Clover Ln	0.4519043	480.5	149.2
	Out - FM 124	0.039297	101.9	11.8
	Project Total	0.4912013	581	161
	R - CowartLwr	0.4519043	480.5	149.2
	R-Cowart	0.4143731	430.1	137.6
	R5	0.0011562	2.9	0.4
	R9	0.0260937	43.7	8

Interim 25-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0344062	106.8	15
	DA-10	0.0126875	47.9	5.6
	DA-11	0.0134531	57.3	5.9
	DA-12	0.0028594	11.9	1.2
	DA-13	0.0012813	5.9	0.6
	DA-14	0.0051719	22.8	2.2
	DA-15	0.01375	57.4	5.8
	DA-16	0.0079375	34.2	3.4
	DA-17	0.0086875	36.9	3.7
	DA-18	0.0015313	7.4	0.7
	DA-19	0.0085781	28.6	3.5
	DA-2	0.0064219	26	2.6
	DA-20	0.0267187	107.5	12.8
	DA-21	0.10442	355.9	43.6
	DA-3	0.0162813	51.8	6.4
	DA-4	0.0165938	61.3	6.9
	DA-5	0.0011562	4.4	0.5
	DA-6	0.120875	377.9	55
	DA-7	0.0260937	57.7	10.7
	DA-8	0.0478906	110.8	19.6
	DA-9	0.0144063	63.4	6.6
	Interim Pond 1	0.2832344	348.1	124.3
	Interim Pond 2	0.1795782	247.4	80.8
	Interim Pond 3	0.0363594	92.2	15.8
	Interim Pond 4	0.0490468	66	20.1
	Interim Pond 5	0.1352813	187.9	61.6
	J12	0.0289531	59.9	11.9
	J9	0.0260937	57.7	10.7
	Out - Cowart Creek	0.4143731	541.2	180.7
	Out - Cowart Total	0.4519043	608.6	196.1
	Out - Cowart - Clover Ln	0.4519043	608.6	196.1
	Out - FM 124	0.039297	134.7	15.9
	Project Total	0.4912013	741.3	212
	R - CowartLwr	0.4519043	608.6	196.1
	R-Cowart	0.4143731	541.2	180.7
	R5	0.0011562	3.8	0.5
	R9	0.0260937	57.6	10.7

Interim 100-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0344062	151.7	21.6
	DA-10	0.0126875	67.8	8
	DA-11	0.0134531	81.3	8.5
	DA-12	0.0028594	17.1	1.7
	DA-13	0.0012813	8.4	0.8
	DA-14	0.0051719	32.6	3.2
	DA-15	0.01375	82.2	8.4
	DA-16	0.0079375	48.7	4.9
	DA-17	0.0086875	52.7	5.3
	DA-18	0.0015313	10.4	1
	DA-19	0.0085781	41.3	5.1
	DA-2	0.0064219	37.7	3.8
	DA-20	0.0267187	149.3	18.1
	DA-21	0.10442	510.2	63.8
	DA-3	0.0162813	75.7	9.5
	DA-4	0.0165938	87.9	10.1
	DA-5	0.0011562	6.3	0.7
	DA-6	0.120875	530.7	78.7
	DA-7	0.0260937	83.3	15.7
	DA-8	0.0478906	160	28.9
	DA-9	0.0144063	88.8	9.4
	Interim Pond 1	0.2832344	541.4	179.4
	Interim Pond 2	0.1795782	358	115.8
	Interim Pond 3	0.0363594	138.1	22.8
	Interim Pond 4	0.0490468	95.1	29.5
	Interim Pond 5	0.1352813	281.8	88.1
	J12	0.0289531	86.4	17.5
	J9	0.0260937	83.3	15.7
	Out - Cowart Creek	0.4143731	887.9	261.2
	Out - Cowart Total	0.4519043	997	283.8
	Out - Cowart - Clover Ln	0.4519043	997	283.8
	Out - FM 124	0.039297	194.9	23.4
	Project Total	0.4912013	1101.3	307.2
	R - CowartLwr	0.4519043	997	283.8
	R-Cowart	0.4143731	887.9	261.2
	R5	0.0011562	5.4	0.7
	R9	0.0260937	83.1	15.7

ULT 3-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0223125	24.3	3.5
	DA-2	0.0064219	11.2	1.1
	DA-3	0.0138438	26.1	3
	DA-4	0.0168281	26.5	2.8
	DA-5	0.0010781	2	0.2
	DA-6	0.10305	154.2	20.5
	DA-7	0.0260937	37.9	4.6
	DA-8	0.0175313	21.4	3
	DA-9	0.0208438	41.2	4.2
	DA-10	0.0144063	27.8	2.8
	DA-11	0.0086563	14.9	1.7
	DA-12	0.0083438	17.4	1.7
	DA-13	0.0027344	4.6	0.4
	DA-14	0.0125469	20.5	2.1
	DA-15	0.0250625	42.3	4.1
	DA-16	0.0061406	10.2	1
	DA-17	0.00375	6.8	0.6
	DA-18	0.0052813	9	0.9
	DA-19 & 20	0.01289	17.9	2.1
	DA-21	0.0177969	27.4	3
	DA-22	0.0086875	15.2	1.5
	DA-23	0.04725	71	8.1
	DA-24	0.0266562	50.2	5.7
	DA-25	0.0049844	8.2	0.8
	DA-26	0.063375	83.8	10
	DA-27	0.0365	57.8	6.5
	J13	0.0288281	40.5	5.1
	J7	0.0186094	22.6	3.2
	J8	0.0394532	54.2	7.4
	J9	0.0260937	37.9	4.6
	Out - Cowart Creek	0.425659	294	76
	Out - Cowart Total	0.4959715	231.4	87.4
	Out - Cowart - Clover Ln	0.4959715	243.2	87.7
	Out - FM 124	0.0370938	63.4	6.8
	Prop Pond 1	0.0348594	32.8	5.6
	Prop Pond 2	0.1881126	101	35.5
	Prop Pond 3	0.0477494	20.3	7.5
	Prop Pond 4	0.3356278	202.1	60.3
	Prop Pond 5	0.0819689	84.1	14.5
	R-Cowart	0.425659	214	75.2
	R-CowartLwr	0.4959715	231.4	87.4
	R5	0.0010781	1.8	0.2
	R7	0.0186094	22.1	3.2
	R9	0.0260937	37.6	4.6
	Total Project	0.5330653	241.9	94.3

ULT 5-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0223125	36.1	5.2
	DA-2	0.0064219	16.3	1.6
	DA-3	0.0138438	35.7	4.1
	DA-4	0.0168281	38.8	4.1
	DA-5	0.0010781	2.9	0.3
	DA-6	0.10305	214.8	29.1
	DA-7	0.0260937	54.3	6.8
	DA-8	0.0175313	31	4.4
	DA-9	0.0208438	57.1	6
	DA-10	0.0144063	38.8	4
	DA-11	0.0086563	21	2.4
	DA-12	0.0083438	23.9	2.4
	DA-13	0.0027344	6.8	0.7
	DA-14	0.0125469	29.8	3.1
	DA-15	0.0250625	62	6.1
	DA-16	0.0061406	14.9	1.5
	DA-17	0.00375	9.8	0.9
	DA-18	0.0052813	13	1.3
	DA-19 & 20	0.01289	26.3	3.1
	DA-21	0.0177969	40.1	4.4
	DA-22	0.0086875	22.2	2.2
	DA-23	0.04725	103	11.9
	DA-24	0.0266562	68.6	8
	DA-25	0.0049844	11.8	1.2
	DA-26	0.063375	124.1	15
	DA-27	0.0365	82.7	9.5
	J13	0.0288281	58.3	7.4
	J7	0.0186094	32.7	4.7
	J8	0.0394532	77	10.6
	J9	0.0260937	54.3	6.8
	Out - Cowart Creek	0.425659	428.4	110.4
	Out - Cowart Total	0.4959715	343.1	127.3
	Out - Cowart - Clover Ln	0.4959715	373.6	127.6
	Out - FM 124	0.0370938	90.1	9.8
	Prop Pond 1	0.0348594	47.5	8.3
	Prop Pond 2	0.1881126	132.6	50.9
	Prop Pond 3	0.0477494	28.1	11.3
	Prop Pond 4	0.3356278	286	87.5
	Prop Pond 5	0.0819689	127.8	21.1
	R-Cowart	0.425659	308.8	109.5
	R-CowartLwr	0.4959715	343.1	127.3
	R5	0.0010781	2.7	0.3
	R7	0.0186094	32.1	4.7
	R9	0.0260937	53.9	6.8
	Total Project	0.5330653	370.3	137.1

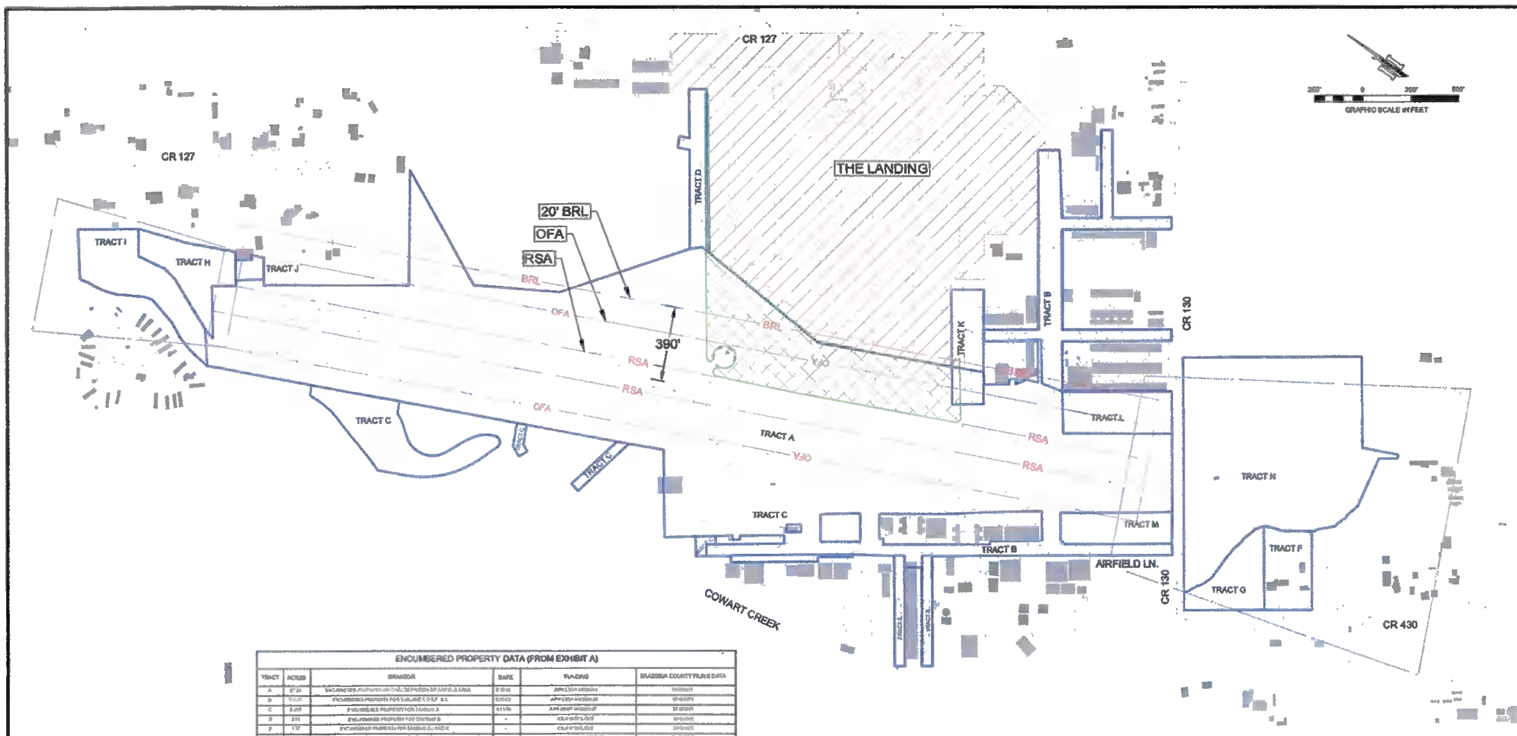
ULT 10-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0223125	46.5	6.8
	DA-2	0.0064219	20.7	2.1
	DA-3	0.0138438	44	5.2
	DA-4	0.0168281	49.6	5.3
	DA-5	0.0010781	3.7	0.3
	DA-6	0.10305	267.4	36.7
	DA-7	0.0260937	68.7	8.6
	DA-8	0.0175313	39.4	5.7
	DA-9	0.0208438	70.8	7.5
	DA-10	0.0144063	48.4	5.1
	DA-11	0.0086563	26.3	3
	DA-12	0.0083438	29.6	3
	DA-13	0.0027344	8.7	0.8
	DA-14	0.0125469	37.9	4
	DA-15	0.0250625	79.4	7.8
	DA-16	0.0061406	19	1.9
	DA-17	0.00375	12.4	1.2
	DA-18	0.0052813	16.6	1.7
	DA-19 & 20	0.01289	33.6	4.1
	DA-21	0.0177969	51.1	5.6
	DA-22	0.0086875	28.3	2.8
	DA-23	0.04725	130.9	15.2
	DA-24	0.0266562	84.5	10
	DA-25	0.0049844	15	1.6
	DA-26	0.063375	159.5	19.5
	DA-27	0.0365	104.4	12.1
	J13	0.0288281	73.8	9.5
	J7	0.0186094	41.6	6
	J8	0.0394532	96.9	13.5
	J9	0.0260937	68.7	8.6
	Out - Cowart Creek	0.425659	525.5	141.1
	Out - Cowart Total	0.4959715	433.2	162.9
	Out - Cowart - Clover Ln	0.4959715	477.1	163.3
	Out - FM 124	0.0370938	113.4	12.5
	Prop Pond 1	0.0348594	53.3	10.8
	Prop Pond 2	0.1881126	162.2	64.6
	Prop Pond 3	0.0477494	31.2	14.6
	Prop Pond 4	0.3356278	330.9	111.7
	Prop Pond 5	0.0819689	167.3	27
	R-Cowart	0.425659	383.6	140
	R-CowartLwr	0.4959715	433.2	162.9
	R5	0.0010781	3.4	0.3
	R7	0.0186094	40.8	6
	R9	0.0260937	68.2	8.6
	Total Project	0.5330653	481	175.4

ULT 25-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0223125	61.4	9.1
	DA-2	0.0064219	27	2.7
	DA-3	0.0138438	55.9	6.6
	DA-4	0.0168281	64.9	7
	DA-5	0.0010781	4.8	0.5
	DA-6	0.10305	341.9	47.5
	DA-7	0.0260937	89	11.4
	DA-8	0.0175313	51.4	7.5
	DA-9	0.0208438	90.4	9.7
	DA-10	0.0144063	62	6.6
	DA-11	0.0086563	33.7	3.9
	DA-12	0.0083438	37.7	3.9
	DA-13	0.0027344	11.5	1.1
	DA-14	0.0125469	49.5	5.3
	DA-15	0.0250625	104.1	10.4
	DA-16	0.0061406	24.8	2.6
	DA-17	0.00375	16.1	1.6
	DA-18	0.0052813	21.6	2.2
	DA-19 & 20	0.01289	44	5.4
	DA-21	0.0177969	66.9	7.5
	DA-22	0.0086875	36.9	3.7
	DA-23	0.04725	170.6	20.1
	DA-24	0.0266562	107.2	12.8
	DA-25	0.0049844	19.6	2.1
	DA-26	0.063375	210.2	25.9
	DA-27	0.0365	135.3	15.9
	J13	0.0288281	95.7	12.5
	J7	0.0186094	54.1	7.9
	J8	0.0394532	125.3	17.6
	J9	0.0260937	89	11.4
	Out - Cowart Creek	0.425659	630.5	185.4
	Out - Cowart Total	0.4959715	562.9	214.3
	Out - Cowart - Clover Ln	0.4959715	622	214.7
	Out - FM 124	0.0370938	146.6	16.4
	Prop Pond 1	0.0348594	63.5	14.4
	Prop Pond 2	0.1881126	207.5	84.3
	Prop Pond 3	0.0477494	33.5	19.5
	Prop Pond 4	0.3356278	412	146.6
	Prop Pond 5	0.0819689	225	35.5
	R-Cowart	0.425659	484.8	184.2
	R-CowartLwr	0.4959715	562.9	214.3
	R5	0.0010781	4.5	0.5
	R7	0.0186094	53.1	7.9
	R9	0.0260937	88.4	11.4
	Total Project	0.5330653	637.7	230.7

ULT 100-Year	Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Volume (AC-FT)
	DA-1	0.0223125	88.7	13.4
	DA-2	0.0064219	38.6	4
	DA-3	0.0138438	77.6	9.3
	DA-4	0.0168281	93	10.3
	DA-5	0.0010781	6.9	0.7
	DA-6	0.10305	478.6	67.7
	DA-7	0.0260937	126.3	16.4
	DA-8	0.0175313	73.3	10.9
	DA-9	0.0208438	126.3	13.8
	DA-10	0.0144063	86.8	9.4
	DA-11	0.0086563	47.4	5.6
	DA-12	0.0083438	52.6	5.6
	DA-13	0.0027344	16.5	1.7
	DA-14	0.0125469	70.7	7.7
	DA-15	0.0250625	149.4	15.3
	DA-16	0.0061406	35.6	3.8
	DA-17	0.00375	23	2.3
	DA-18	0.0052813	30.8	3.3
	DA-19 & 20	0.01289	63.1	7.9
	DA-21	0.0177969	95.8	10.9
	DA-22	0.0086875	52.7	5.3
	DA-23	0.04725	243.3	29.3
	DA-24	0.0266562	148.9	18
	DA-25	0.0049844	27.9	3.1
	DA-26	0.063375	303.1	38.1
	DA-27	0.0365	191.8	23
	J13	0.0288281	136.2	18.1
	J7	0.0186094	77.1	11.5
	J8	0.0394532	177.6	25.3
	J9	0.0260937	126.3	16.4
	Out - Cowart Creek	0.425659	860.2	268
	Out - Cowart Total	0.4959715	808	310.3
	Out - Cowart - Clover Ln	0.4959715	889.3	310.9
	Out - FM 124	0.0370938	207.4	23.6
	Prop Pond 1	0.0348594	84.5	21.1
	Prop Pond 2	0.1881126	289.6	121
	Prop Pond 3	0.0477494	37.6	28.7
	Prop Pond 4	0.3356278	577.4	211.9
	Prop Pond 5	0.0819689	327	51.4
	R-Cowart	0.425659	680.4	266.7
	R-CowartLwr	0.4959715	808	310.3
	R5	0.0010781	6.4	0.7
	R7	0.0186094	75.8	11.5
	R9	0.0260937	125.5	16.4
	Total Project	0.5330653	926	333.9

Approved: September 14, 2021

BRAZORIA DRAINAGE DISTRICT 4



ENCUMBERED PROPERTY DATA (FROM EXHIBIT A)					
TRACT	ACRES	GRANTOR	DATE	FUNDING	BRAZORIA COUNTY FILING DATA
A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
D	[illegible]	[illegible]	-	[illegible]	[illegible]
E	[illegible]	[illegible]	-	[illegible]	[illegible]
F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]

LEGEND	
ENCUMBERED PROPERTY (PER APPROVED ALP)	
THE LANDING LIMITS	
STORMWATER MANAGEMENT DETENTION POND	
RUNWAY SAFETY ARE	RSA
RUNWAY OBJECT FREE AREA	OFA
20' BUILDING RESTRICTION LINE	BRL

PEARLAND REGIONAL AIRPORT
DEVELOPMENT LAYOUT
SEPTEMBER 1, 2022

CLOVER ACQUISITION
CORPORATION

SENT VIA E-MAIL

August 18, 2022
Federal Aviation Administration
Attn: Frank Snell
Texas Airports District Office
10101 Hillwood Parkway
Fort Worth, TX 76177

Re: Aeronautical Study Number 2022-ASW-4865-NRA

Dear Mr. Snell,
We are in receipt of the July 08, 2002 (FAA Form 7460-1) determination letter (sent to Jacob White Construction with Pearland Regional Airport copied) and request the appeal and review of said determination. We believe the detention pond construction and neighboring development called The Landing at Pearland **do not** create any adverse effects on the safe and efficient utilization of the navigable airspace at Pearland Regional Airport (KLVJ).

The purpose for this correspondence is to show how Clover Acquisition Corporation ("Sponsor"), owner of Pearland Regional Airport ("Airport"), in cooperation with The Landing at Pearland, Ltd. ("The Landing"), a proposed manufactured home leasing site adjacent to KLVJ will mitigate and manage any concerns regarding non compatible land use.

Title 49, US Code 47107 a (10) is the basis for compatible land use for Federally obligated airports such as KLVJ. The following statement is also given in FAA Order 5290.6B, the FAA Compliance Manual. "Appropriate action, including the adoption of zoning laws, has been or will be taken to the extent reasonable to restrict the land next to or near the airport to uses that are compatible with normal airport operations" (underlining added).

Clover Acquisition Corporation
166 Hargraves Drive
Suite C400-536
Austin, Texas 78737
(281) 763-0457
www.cloverac.com

Pearland Regional Airport
17622 Airfield Lane
Pearland, Texas 77581
(281) 482-7551
www.flypearland.com

4833 Spicewood Springs Road, Suite 204
Austin, TX 78759
512.342.6868

August 19, 2022

Mr. Stephen Alexander
Clover Acquisition Corporation
17622 Airfield Lane
Pearland, TX 77581

via email:
Salexander@texasaviationpartners.com

Re: The Landing
FAA OE/AAA Aeronautical Study Determination

Dear Mr. Alexander:

KSA Engineers, Inc. (KSA) prepared and submitted the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) studies for The Landing. The Federal Aviation Administration (FAA) has the authority to conduct aeronautical studies for planned structures, both on and off airport, through the FAA's OE/AAA process. KSA has submitted hundreds of OE/AAA studies for both airport owners and private individuals.

Prior to submitting the OE/AAA studies, KSA confirmed that the filing of studies is required. KSA also reviewed FAA defined surfaces for navigable airspace as defined by Title 14 of the Code of Federal Regulations (14CFR) Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace (Far Part 77). KSA's review of Part 77 did not indicate that any portion of The Landing was a penetration or obstruction to defined surfaces. The FAA's OE/AAA determination letter does not specifically list a surface that is penetrated by The Landing.

KSA also reviewed other defined FAA surfaces to confirm that The Landing did not encroach on these surfaces. KSA reviewed FAA Advisory Circular (AC) 150/5300-13B Airport Design (March 31,2022). The Landing does not penetrate, obstruct, or encroach on any surface associated with the layout and design of an airport.

It is KSA's experience that residential development in close proximity to an airport is discouraged by the FAA. Municipal airports have the ability to control off airport development though the use of height hazard zoning. The height hazard zoning adopted typically includes those surfaces as defined by Part 77. As a privately owned airport, outside the city limits of surrounding municipalities, Pearland Regional Airport has no know avenue to establish height hazard zoning. Regardless, The Landing is not an obstruction or penetration to surfaces defined by FAR Part 77 or FAA AC 150/533-13B.

In KSA's opinion and experience, the stated opinion of the FAA in the OE/AAA study response does not have an impact on The Landing in terms of proceeding with development. It is also KSA's opinion that any impact would be to Pearland Regional Airport as an entity that has received Federal grant funds and is eligible to receive Federal grant funds.

Respectfully,

KSA Engineers, Inc.

Craig H. Phipps, P.E.
Vice President, Aviation Practice Director

Aviation Investigation Final Report

Location:	Pearland, Texas	**Accident Number:**	CEN21FA239
Date & Time:	May 29, 2021, 14:51 Local	**Registration:**	N124MS
Aircraft:	PZL Warszawa-Okecie PZL-104	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control on ground	**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Airplane position data indicated that the pilot and pilot-rated passenger conducted a local flight before entering the airport traffic pattern for landing. The pilot-rated passenger stated that it was a "good landing." The airplane touched down on the runway centerline, did not bounce, and tracked straight down the runway until it veered to the right. The pilot applied left rudder, but the airplane did not respond. The airplane departed the runway pavement and encountered a ditch located between the runway and the parallel taxiway.

A witness reported that the airplane touched down briefly but that it became airborne again and, about that time, veered to the right. It remained in a level attitude as it yawed to the right and exited the runway.

Airport surveillance video footage depicted the airplane in a stabilized descent during the downwind to final turn. The pilot initiated the landing flare, and the airplane appeared to settle onto the runway. Shortly afterward, it veered abruptly to the right. The runway exhibited scuffing marks that began near the 1,000-ft touchdown markers and proceeded in a righthand arc to the edge of the pavement. The tracks continued into the grass area adjacent to the runway to the edge of the drainage ditch running between the runway and taxiway. The airplane impacted the opposite (rising embankment) side of the ditch, rose out of the ditch, and came to rest adjacent to the taxiway. The forward fuselage sustained substantial damage. A postrecovery airplane examination did not reveal any anomalies that would have precluded normal operations.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's loss of directional control during landing. Contributing to the severity of the accident was the presence of a drainage ditch between the runway and taxiway.

Findings

Aircraft	Directional control - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	Runway/landing area condition - Contributed to outcome

Factual Information

History of Flight

Landing-flare/touchdown Loss of control on ground (Defining event)

On May 29, 2021, at 1451 central daylight time, a PZL Warszawa-Okecie PZL-104 Wilga 35 airplane, N124MS, was substantially damaged when it was involved in an accident at the Pearland Regional Airport (LVJ), Pearland, Texas. The pilot was fatally injured; the passenger was seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Automatic dependent surveillance – broadcast (ADS-B) data indicated that the flight departed the Texas Gulf Coast Regional Airport (LBX) at 1406. The pilot proceeded east and overflew a portion of Galveston Island before turning north to LVJ. He entered a left downwind for runway 14 and completed a continuous left turn from downwind to final approach. The final ADS-B data point was recorded at 1451:00 as the airplane was on short final about 51 ft from the runway arrival threshold. ADS-B data was not available for the accident sequence.

The pilot-rated passenger stated that it was a "good landing." The airplane touched down on the runway centerline and did not bounce. It was initially tracking straight down the runway until it veered to the right. The pilot applied left rudder, but the airplane did not respond. The airplane subsequently departed the runway pavement and encountered a ditch located between the runway and the parallel taxiway. She reported that there were no issues with the airplane during the accident flight.

A witness, located in a helicopter holding short of the runway at the time of the accident, reported that the airplane touched down near the 1,000-foot markers. He recalled that the main landing gear touched down briefly but the airplane became airborne again. About that time, the airplane veered to the right. It remained in a level attitude as it yawed to the right and exited the runway.

Airport surveillance video footage depicted the airplane during the downwind to final turn. The airplane appeared to be in a stabilized decent during that time. As the airplane reached short final, the camera field of view was obstructed by a hangar on the airport. When the airplane re-entered the field of view, the pilot initiated a landing flare. Shortly after the airplane appeared

to settle onto the runway, it veered abruptly to the right, and it exited the runway pavement. The airplane subsequently encountered a ditch located between the runway and the parallel taxiway. The airplane dropped into the ditch momentarily, reappeared on the opposite side, and came to rest.

Pilot Information

Certificate:	Private	**Age:**	54,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	None None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	300 hours (Total, all aircraft)		

Pilot-rated passenger Information

Certificate:	Private	**Age:**	38,Female
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	February 21, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 22, 2020
Flight Time:	350 hours (Total, all aircraft), 8 hours (Last 90 days, all aircraft)		

The pilot did not hold a current FAA medical certificate, and there was no record of him completing certification under the Basic Med program.

Aircraft and Owner/Operator Information

Aircraft Make:	PZL Warszawa-Okecie	**Registration:**	N124MS
Model/Series:	PZL-104 Wilga 35	**Aircraft Category:**	Airplane
Year of Manufacture:	1975	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	140543
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	July 1, 2020 Condition	**Certified Max Gross Wt.:**	2866 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3674 Hrs	**Engine Manufacturer:**	Silnik
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	AI-14AR/6
Registered Owner:		**Rated Power:**	260 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LVJ,44 ft msl	**Distance from Accident Site:**	0.5 Nautical Miles
Observation Time:	14:53 Local	**Direction from Accident Site:**	140°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / 0 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	30°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Angleton, TX (LBX)	**Type of Flight Plan Filed:**	None
Destination:	Pearland, TX (LVJ)	**Type of Clearance:**	None
Departure Time:	14:07 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Pearland Regional LVJ	**Runway Surface Type:**	Concrete
Airport Elevation:	44 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	14	**IFR Approach:**	None
Runway Length/Width:	4313 ft / 75 ft	**VFR Approach/Landing:**	Traffic pattern

A parallel taxiway was located about 250 ft west of the runway. A drainage ditch, about 120 ft wide by 10 ft deep, was located between the runway and the parallel taxiway.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	29.52238,-95.243925

The runway exhibited scuffing marks consistent with being formed by the main wheels beginning near the end of the touchdown (1,000-foot) markers. They proceeded in a righthand arc to the edge of the pavement and continued into the grass area adjacent to the runway. A small scuff mark began near the edge of the pavement and appeared consistent with being formed by the tail wheel. The tracks continued through the grass to the edge of the ditch running parallel to the runway. Ground impact marks were located on the opposite (rising embankment) side of the ditch in line with the tire marks. A second ground impact mark was located on the opposite side of the ditch immediately adjacent to the parallel taxiway.

The airplane came to rest upright oriented on a south heading. The engine was separated and located along the taxiway near the airframe. The two-blade, wooden propeller was fragmented. The forward fuselage was crushed aft consistent with impact to the rising embankment of the ditch. The cockpit area was compromised, and the main landing gear had collapsed. The center fuselage immediately aft of the cabin buckled. The aft fuselage appeared undamaged, and the empennage remained attached. Both wings remained attached to the fuselage and exhibited minor impact-related damage but appeared otherwise intact.

The flight controls remained attached and control continuity was confirmed from each flight control surface to the cockpit area. The cockpit floor/lower fuselage was buckled, and the cockpit controls were damaged consistent with impact. Both cockpit control sticks were free to move but limited due to the surrounding fuselage damage. The rudder pedals remained attached to the floor structure. The control linkage remained attached to the pedals. The rudder control linkage was damaged aft of the pedals consistent with impact damage. Wing flap control continuity from the cockpit flap handle to the flaps was confirmed. Flap travel was restricted due to deformed fuselage structure at the cockpit flap lever.

Both left and right main landing gear were deformed aft and upward consistent with damage to the forward fuselage. The upper and lower gear legs appeared intact and securely connected. The left oleo strut was attached and appeared intact. The right oleo strut was separated at the upper/forward attachment point. Specifically, the strut upper attachment lug was fractured near the safety wire through-hole. The appearance of the fracture surface was consistent with overstress failure. The aft/lower end of the strut remained attached to the lower gear leg. It was bent inboard but appeared otherwise intact. The right oleo strut assembly itself appeared intact. Both main wheels rotated freely and remained inflated. Scuff marks were apparent on left main tire; the right main tire appeared intact. Tread remained on both tires, and both landing gear assemblies exhibited impacted dirt and vegetation. The brake pads on both main wheels appeared to be serviceable and unremarkable. Brake lines were intact at the brake assemblies and along the struts. No evidence of brake fluid leaks was observed. The tail wheel assembly appeared intact and was free to rotate. The tire remained inflated and exhibited sufficient tread.

A postrecovery airplane examination did not reveal any anomalies attributable to a preimpact failure or malfunction.

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy		
Additional Participating Persons:	Ronald Jacobs; FAA Flight Standards; Houston, TX		
Original Publish Date:	December 7, 2022	**Investigation Class:**	3
Note:			
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=103167		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available here.

CLOVER ACQUISITION
CORPORATION

FAA Order 5190.6B, 20.2 e further states "Compatible use of land Is obtained when the use of adjacent property neither adversely affects flight operations from the airport nor is itself adversely affected by such flight operations." (underlining added)

Under the above guidance, the Sponsor and The Landing will ensure conditions where neither flight operations nor the normal conditions of residency for The Landing are adversely affected.

Sponsors Role – Sponsor will continue to manage the Airport to provide a safe and suitable airport, meet all ordinances and grant assurances, while keeping the Airport financially viable as per Grant Assurance 24. As the Airport is privately owned, it has neither the authority or ability to create zoning laws or use local or state public funds to maintain the property. Sponsor will work closely with The Landing to ensure airport operations and residency conditions do not adversely affect each other on a continuing daily basis. This could include local guidelines for traffic pattern operations, arrival, and departure guidelines. In no instance will safety of flight or ground operations be compromised by any such guideline.

Role for The Landing – All residents at the Landing will not own the land. All land, including the pad sites for manufactured homes will remain the property of The Landing company. Residents will only own their individual houses. This provides the advantage that the Sponsor need only to negotiate with one entity for the rules, limits, and restrictions for all Landing residents. The Landing will require all residents, homeowners, or sublessees alike to sign contracts for the pad lease and for specific rules and limits as part of their residency. The Landing management will actively patrol the Landing neighborhood for continuing residency safety as well as compliance with all rules and limits including a strict enforcement of trash and waste rules to prevent wildlife attraction. Means to report by residents and airport patrons to The Landing and the Sponsor (when appropriate) alike will be established and maintained in letters of agreement between the Sponsor and The Landing management. Any residence who does not comply with the required rules and limits could ultimately lose their pad ground lease and be required to

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Suite C400-536
Austin, Texas 78737
(281) 763-0457
www.cloverac.com

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(281) 482-7551
www.flypearland.com

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move out of the Landing neighborhood. These actions by The Landing and the Sponsor are deemed "appropriate action" to obtain compatible land use.

Joint Roles – The Sponsor and The Landing will take appropriate steps to ensure the flow of information between airport users and Landing Residents is robust. Steps such as Airport Open House Days for Landing residents, periodic public hall meeting between the groups, newsletters and social media websites are potential means to accomplish this.

Additional information concerning lease agreements at the Landing – Lease holders will be informed that part of the fee in their pad lease agreement pays for security and code enforcement personnel and equipment. Each lessee will receive information at the time their lease agreement is signed the steps The Landing will take if violations to standards are committed.

First Offense – The Landing will inform the tenant the nature of the violation and will assist, if necessary, to bring the tenant into compliance.

Second Offense – A violation in the same category of a recorded first offense may represent a tenant's lack of understanding or indifference to the requirements. A second offence of a separate nature may be treated as a first offense by The Landing, however, a visit to the tenant to review the Regulations may be required at the discretion of The Landing.

Third and subsequence Offense – A third and any subsequence offense of any category could be grounds for termination of the lessee's lease agreement. If invoked, this would require the lessee sell the home to a party meeting the requirements for Landing residence, remove the home from the Landing, or subleasing to a third party again meeting the requirements for Landing residence.

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Finally, it was mentioned in the determination letter that a land release was not obtained in order to allow detention to occur on the Airport-owned property that is federally encumbered. The Airport and The Landing have entered into a non-exclusive drainage agreement and easement for the property. The area has historically been used for drainage as it sits too close to the runway safety area for vertical development and aeronautical use. The only productive use for this particular area of the Airport was and is drainage. Numerous other airport users (both on airport and off airport) use this area for drainage currently. The use is not changing. All improvements made to the drainage basin for this project have been funded privately by The Landing, further benefitting the existing drainage system at the Airport. Additionally, the Airport received in excess of $200,000 of additional drainage improvements made to the existing on-airport drainage network all funded by The Landing, creating an additional benefit to the Airport.

Summary – The Sponsor and The Landing offer the enclosed information to the FAA ADO and TxDOT AVN to ensure the requirement of compatible land use for both the Airport and the Landing residential area. Since inception of the FAA Modernization and Reform Act of 2012 (Public law 112-95) Residential Through-The-Fence agreements were formalized with specific requirements for both RTTF tenants and sponsors. While the relationship between the Sponsor and The Landing is not a RTTF arrangement, certain elements of commonality are recognized. Residential land use in near proximity to public use airports does exist and work safely and smoothly; the common element being full time management for the relationship between the parties. The Sponsor and The Landing are committed to the requirements to ensure the arrangement works. I have attached the Rules and Regulations that are in place for The Landing residents. Please let us know what other questions we can answer, documentation we can provide and how else we may be of assistance. We look forward to your reply and reconsideration of the initial determination letter for all 45 OE studies.

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CLOVER ACQUISITION
CORPORATION

Sincerely,

Stephen D. Alexander

President

Clover Acquisition Corporation

dba Pearland Regional Airport

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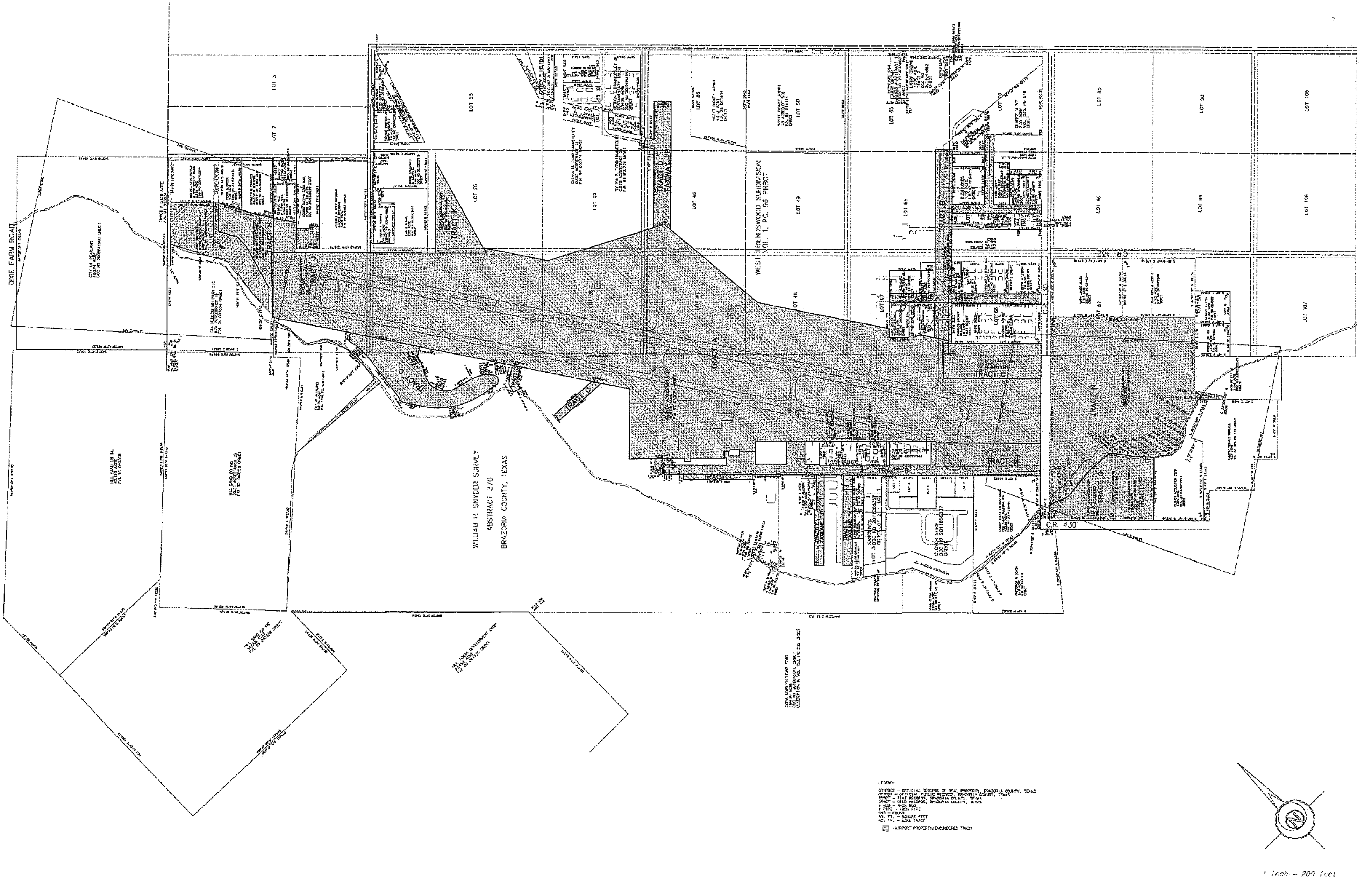
FAA Docket ~~16-22-06~~

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

EXHIBIT B

Airport Property Maps, 2017 and 2022



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B	[illegible]	ENCUMBERED PROPERTY FOR TAXIWAY [illegible]	[illegible]	[illegible]	[illegible]
C	[illegible]	ENCUMBERED PROPERTY FOR TAXIWAY [illegible]	[illegible]	[illegible]	[illegible]
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G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	ALAN MANSFIELD AND ROXANE MANSFIELD	[illegible]	[illegible]	[illegible]
I	[illegible]	CONVEYED TO CLOVER FIELD [illegible]	[illegible]	[illegible]	[illegible]
J	[illegible]	CONVEYED TO CLOVER [illegible]	[illegible]	[illegible]	[illegible]
K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible]	[illegible]	[illegible]		[illegible]

AIRPORT PROPERTY MAP

PEARLAND REGIONAL AIRPORT (LVJ)

TEXAS DEPARTMENT OF TRANSPORTATION
AVIATION DIVISION

DAVID FULTON, DIRECTOR
AVIATION DIVISION
DATE 9/12/17

AIRPORT SPONSOR

SIGNATURE 8/24/2017 DATE

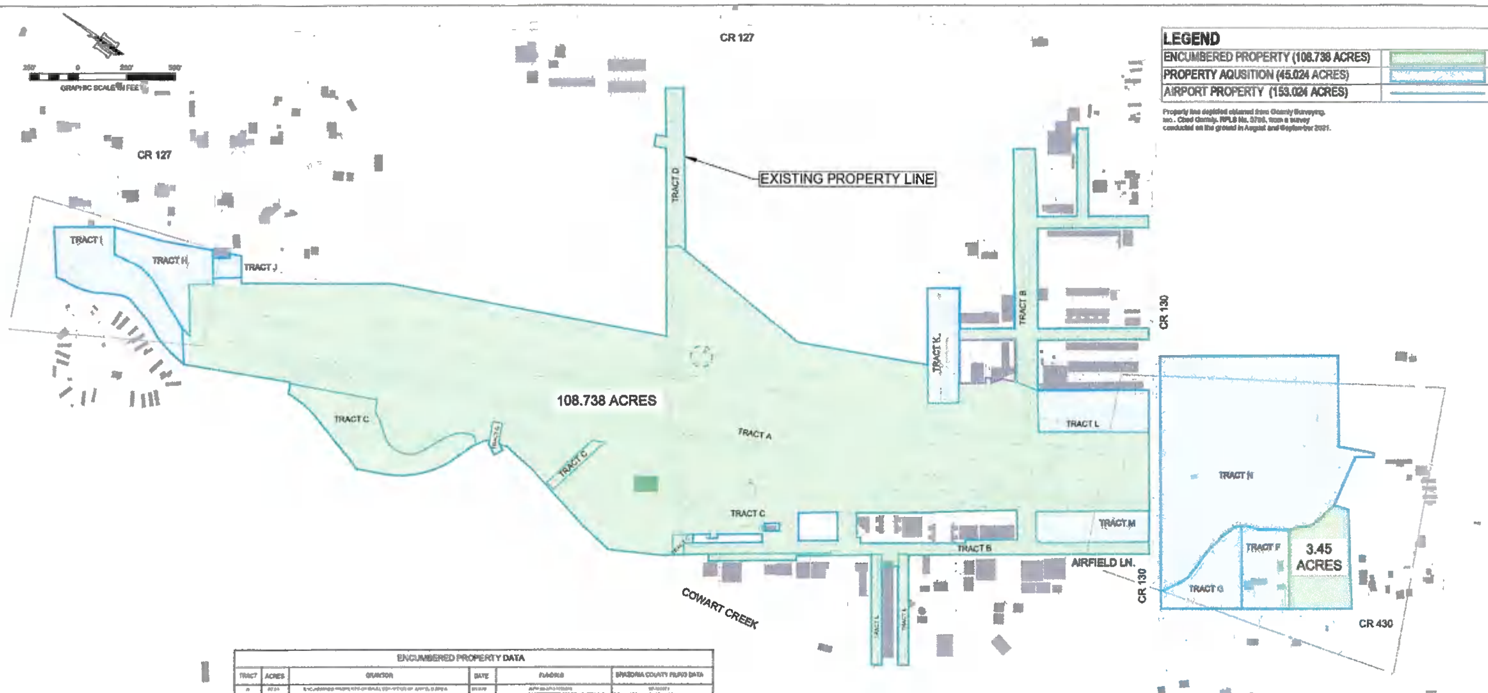
TITLE: AIRPORT SPONSOR'S REPRESENTATIVE

PREPARED BY

PREPARED FOR
TEXAS AVIATION PARTNERS, LLC

REV. DATE: 8.17.2017

SHEET 1 OF 1



ENCUMBERED PROPERTY DATA

TRACT	ACRES	GRANTOR	DATE	FILINGS	BRAZORIA COUNTY FILING DATA
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[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]		[illegible]

TEXAS DEPARTMENT OF TRANSPORTATION AVIATION DIVISION	AIRPORT SPONSOR
SIGNATURE DATE	SIGNATURE DATE
TITLE	TITLE
PREPARED BY: KSA ENGINEERS, INC.	PREPARED FOR: PEARLAND REGIONAL AIRPORT, PEARLAND, TEXAS

KSA

DES: MM	ISSUE RECORD			
DR: CJM	NO.	BY	DATE	REVISION
CH: MM				
APP: MM				

PEARLAND REGIONAL AIRPORT
PEARLAND, TEXAS

AIRPORT PROPERTY MAP

KSA JOB NO. TAP.007

DATE: March 28, 2022

EXHIBIT A

SHEET NO.

FAA Docket 16-22-06

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

EXHIBIT C

Excerpts from The Landing's Rules and Regulations

Excerpts from The Landing's Rules and Regulations

(A) Prohibited Activities. The following activities are prohibited at any time as LVJ operates 24 hours a day:

1. **Radio and Other Transmissions.** Radio and electromagnetic transmissions that might interfere with general aviation communications, navigation systems, and equipment;
2. **Lasers or Other Lights.** Use of any laser, light shows, or lighting that could be deemed to interfere with the safe navigation of airspace or aircraft;
3. **Noise.** Exterior speakers, horns, whistles, bells or other sound devices audible at the property line of adjoining lots. Because the property is adjacent to LVJ noise may be heard at all hours of the day and users are advised to take appropriate precautions;
4. **Firearms, fireworks, and Explosive Discharges.** Explosive discharges, firearms, and fireworks;
5. **Aerial Activities.** Kites, balloons, rockets, model aircraft of any kind, drones, and any manned or unmanned aerial devices above a height of 20 feet;
6. **Burning – Smoke.** Discharge of anything limiting aerial visibility, including smoke, dust, and water vapor. Burning or disposal of trash or vegetation; open fires larger that an outdoor cooking grill or residential fire pit;
7. **Access to and use of the Airport.** The Landing will be fenced from LVJ by a privacy fence. Climbing upon or attaching anything to this fence is prohibited and no one may access or use LVJ for any purpose. Unauthorized access and use is a violation of the law. Loitering, or congregating in any manner in or around LVJ grounds and will be reported to the authorities as trespass;
8. **Animals and Pets.** Animals, other than household pets. Residents and visitors shall not permit their animals to enter LVJ. Aviculture, the practice of keeping birds, is prohibited because of the hazards posed to aircraft by birds in flight. No activity that attracts birds or other wildlife will be permitted;
9. **Foreign Objects.** No foreign objects, including bottles, cans, scrap, nuts, bolts, nails, or any object that may cause damage to an aircraft, shall be left upon the Property as the same may be blown onto the Airport property and cause a hazard to aircraft. Individuals are encouraged to pick up such foreign objects when observed and place them in a trash receptacle. All trash shall be deposited in approved receptacles pursuant to the Rules and Regulations;
10. **Surreptitious Activities and Security.** Any person observing suspicious, unauthorized or criminal activities should report such activities immediately to The Landing management and/or the airport manager, local police, officers of the Texas Department of Public Safety, and the Transportation Security Administration General Aviation Information Hotline at 1-866-427-3287. Residents are advised that the Transportation Security Administration publication "Security Guidelines for General Aviation Airports," Information Publication A-001, is available for reference at their website - www.tsa.gov/.

(B) Height Limits and General Regulations. The following general regulations shall apply at all times:

1. **Height Limitations.** No structure, plant, or tree that obstructs air space or interferes with visual, radar, radio, or other systems for tracking, acquiring data relating to, monitoring, or controlling aircraft shall be permitted;
2. **Antennae.** No exterior radio or television antenna or aerial or satellite dish receiver, or other devices designed to receive telecommunication signals, including, but not limited to, radio, television, or microwave signals which are intended for cable television, network television receptions, or entertainment purposes shall be erected or maintained; provided, however, that a satellite dish or other similar instrument with a diameter no greater than 18 inches may be located on a resident's homesite. Further rules and regulations consistent with rules adopted by the FAA, TxDOT, and/or the Federal Communications Commission

for the erection, use, screening, or placement of antennas and satellite dishes may be imposed at any time;

3. **Lighting.** All lighting shall be ground-mounted and visually shielded by valences to prevent light pollution and/or airport hazards. Lighting shall be designed and installed so as to light only the exterior walls of the building and to avoid light pollution. Lighting shall be installed so as not to create traffic hazards or airport hazards due to impairment of vision and/or confusion with traffic signals. Temporary lighting such as spotlights, laser light transmissions, or any concentrated lighting visible that is distracting to flight operations is prohibited;
4. **Exterior Walls and Roof Design - Materials.** All exterior wall and roof colors will be governed and approved by The Landing pursuant to the Rules and Regulations. Roof design shall be low pitch or such other design as Landlord may approve. Roofs shall be constructed of or coated with non-reflective material to prevent airport hazards. All building materials shall be subject to the standards set forth in the rules and regulations and other applicable Regulations as promulgated from time-to-time;
5. **General Maintenance.** Tenant or other occupant (or both of them) of each homesite within The Landing shall have the duty of and responsibility for keeping the Tenant's lot, the adjacent sidewalks, and the improvements thereon, in a well maintained, safe, clean and attractive condition at all times. Without limiting the generality of the foregoing:

    i. Maintenance shall include regular mowing, watering, fertilizing, edging of turf areas, and weed control of the turf and landscape areas pursuant to the Regulations. Diseased or dead plants and trees must be removed and replaced.
    ii. All visible exterior surfaces of the improvements must be maintained to include prompt painting/replacement of dull, discolored and/or peeling paint or other finish, repair/replacement of rotted, cracked, broken or disconnected surfaces or appurtenances thereto, and repair/replacement of missing, discolored, peeling or curling materials.
    iii. Maintenance shall also include removal of paper, debris and refuse from the Lot. During construction, dirt, construction debris and other construction related refuse shall be cleaned from street, sidewalks, culverts, and storm drains, and inlets.
6. **Trash and Litter.** Trash and litter can attract birds and other wild animals, creating a potential hazard to the Airport. No boxes, crates, cans, bottles, paper, tall grass, weeds, unusable scrap or wreckage, scrap wood or metal, discarded airplane or automobile tires, trash, or other litter shall be permitted to accumulate in or about the Property. If such trash and litter is permitted to accumulate around Landlord may have the area cleaned and the cost for such cleaning shall be charged to the tenant or other user. All trash, rubbish and household waste must be contained in sealed containers as approved by The Landing. All such material must be managed and contained to eliminate birds and other wildlife.

FAA Docket 16-22-06

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

EXHIBIT D

Obstruction Evaluation Determinations of No Hazard[1]

[1] The FAA conducted five separate aeronautical studies for The Landing, the homes, the clubhouse, the maintenance building, the pavilion, and the water treatment plant. Provided here are determinations for home points 5, 6, and 7 (the closest points to the runway at KLVJ) as identified in the Overview on the final page of the attachment. Also, to reduce the electronic size of the filing, while each of the determinations are 5 pages in length, only the determination for point 5 is included in its entirety. For points 6 and 7 only the first two pages are included. Pages 3 through 5 of each determination are similar – Page 3 is an overview of the five obstruction evaluation cases, page 4 is a topographical map showing the location of the point in question, and page 5 is a portion of the VFR sectional chart showing the point in question. Clover views the topographical map and sectional for each point is unnecessarily redundant.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-ASW-11524-OE

Issued Date: 02/27/2023

Sean Mickler
Jacob White Construction
2000 W Parkwood Avenue
Friendswood, TX 77546

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	House Home P5
Location:	Pearland, TX
Latitude:	29-31-16.91N NAD 83
Longitude:	95-14-24.65W
Heights:	39 feet site elevation (SE)
	14 feet above ground level (AGL)
	53 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

The proposal has the potential to attract hazardous wildlife on or near a public-use airport. The FAA recommends, and local code may require, adherence to guidance in Advisory Circular 150/5200-33, Hazardous Wildlife Attractants on or Near Airports. The FAA encourages the sponsor to coordinate with the local airport owner/operator prior to any construction at the site and to verify that no potential exists to attract hazardous wildlife on or near the public-use airport.

The structure considered under this study lies in proximity to an airport and occupants may be subjected to noise from aircraft operating to and from the airport.

This determination expires on 08/27/2024 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

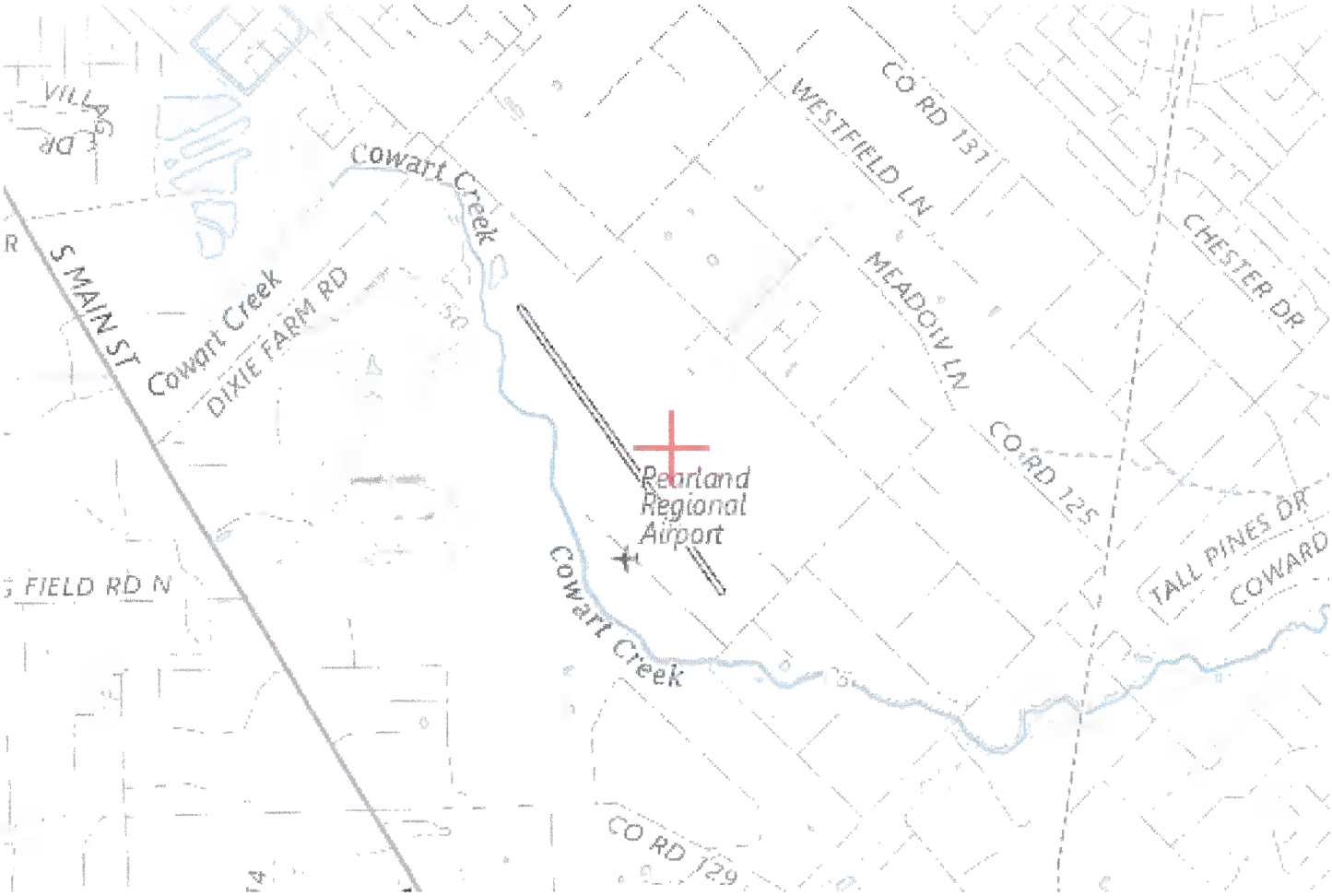
If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-ASW-11524-OE.

Signature Control No: 530962776-574276944 (DNE)
Andrew Hollie
Specialist

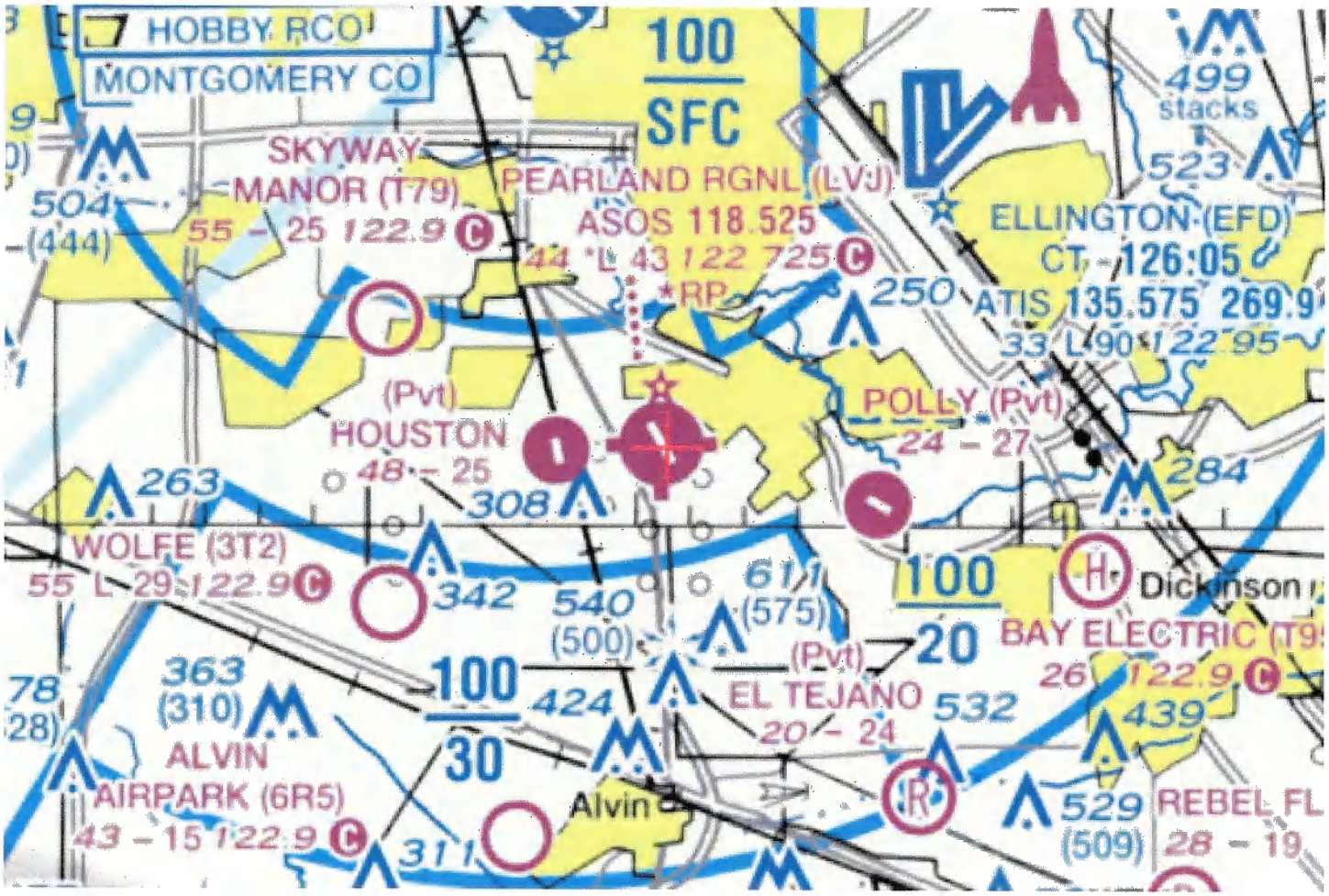
Attachment(s)
Case Description
Map(s)

The Landings at Pearland will be submitted within 5 separate aeronautical studies. There will be a submittal for the overall development and the height of the homes, the Maintenance Building, the Clubhouse, the Pavilion, and the Water Treatment Area. This first proposal is for the homes themselves.

TOPO Map for ASN 2022-ASW-11524-OE



Sectional Map for ASN 2022-ASW-11524-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-ASW-11525-OE

Issued Date: 02/27/2023

Sean Mickler
Jacob White Construction
2000 W Parkwood Avenue
Friendswood, TX 77546

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	House Home P6
Location:	Pearland, TX
Latitude:	29-31-13.30N NAD 83
Longitude:	95-14-24.18W
Heights:	40 feet site elevation (SE)
	14 feet above ground level (AGL)
	54 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

The proposal has the potential to attract hazardous wildlife on or near a public-use airport. The FAA recommends, and local code may require, adherence to guidance in Advisory Circular 150/5200-33, Hazardous Wildlife Attractants on or Near Airports. The FAA encourages the sponsor to coordinate with the local airport owner/operator prior to any construction at the site and to verify that no potential exists to attract hazardous wildlife on or near the public-use airport.

The structure considered under this study lies in proximity to an airport and occupants may be subjected to noise from aircraft operating to and from the airport.

This determination expires on 08/27/2024 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-ASW-11525-OE.

Signature Control No: 530962777-574276968 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2022-ASW-11526-OE

Issued Date: 02/27/2023

Sean Mickler
Jacob White Construction
2000 W Parkwood Avenue
Friendswood, TX 77546

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	House Home P7
Location:	Pearland, TX
Latitude:	29-31-07.69N NAD 83
Longitude:	95-14-19.62W
Heights:	39 feet site elevation (SE)
	14 feet above ground level (AGL)
	53 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

The proposal has the potential to attract hazardous wildlife on or near a public-use airport. The FAA recommends, and local code may require, adherence to guidance in Advisory Circular 150/5200-33, Hazardous Wildlife Attractants on or Near Airports. The FAA encourages the sponsor to coordinate with the local airport owner/operator prior to any construction at the site and to verify that no potential exists to attract hazardous wildlife on or near the public-use airport.

The structure considered under this study lies in proximity to an airport and occupants may be subjected to noise from aircraft operating to and from the airport.

This determination expires on 08/27/2024 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

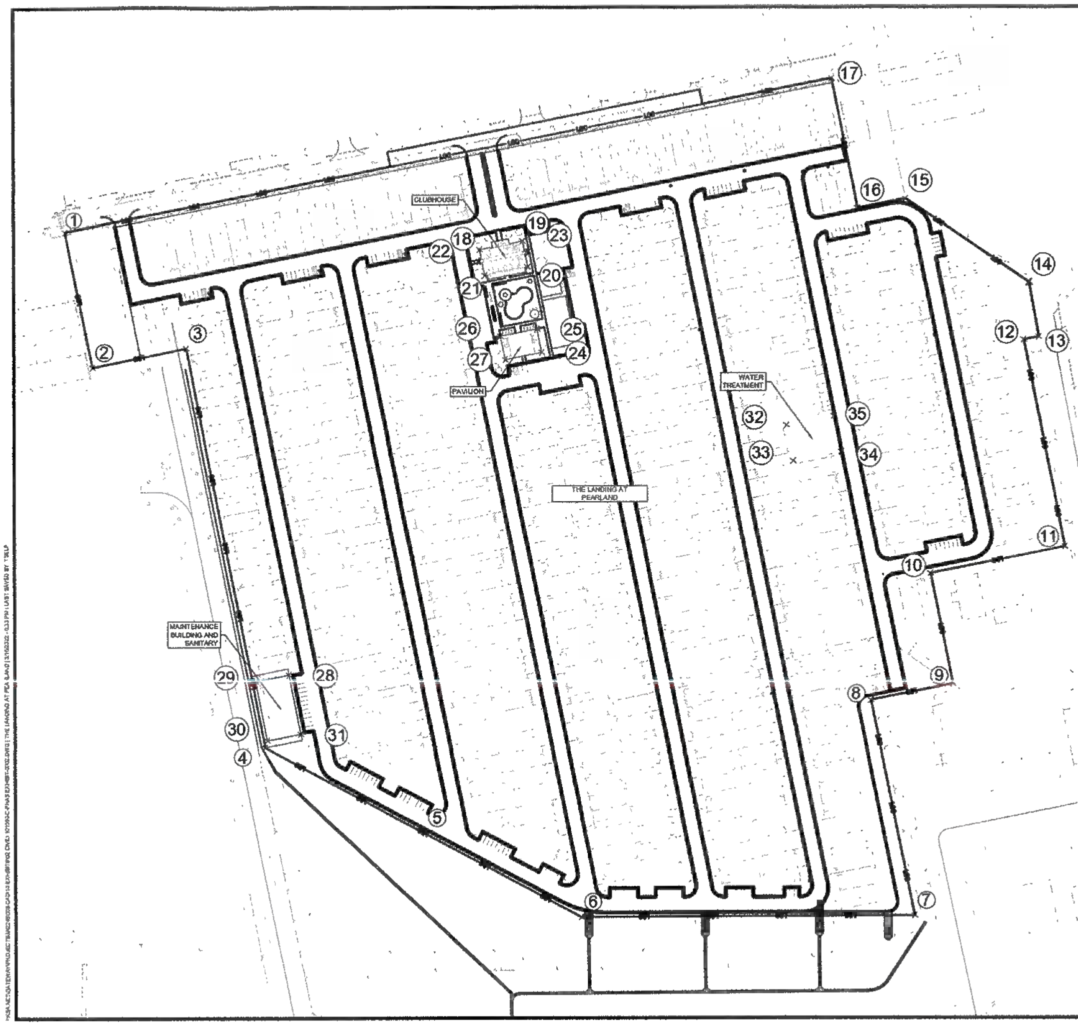
This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-ASW-11526-OE.

Signature Control No: 530962778-574276966 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)



100' 0 100' 200'

GRAPHIC SCALE IN FEET

GENERAL NOTES:

1. PRIOR TO BEGINNING WORK IN EACH PHASE, CONTRACTOR SHALL PERFORM THE FOLLOWING.

1.1 NOTIFY AIRPORT OF WORK SO THE AIRPORT CAN ISSUE APPROPRIATE NOTAMS.
1.2 INSTALL LOW PROFILE BARRICADES AT THE LOCATIONS SHOWN.
1.3 STAKE THE LIMITS OF WORK AREA WHERE CONSTRUCTION AND AIRCRAFT INTERACT
1.4 INSTALL APPROPRIATE EROSION CONTROL DEVICES PRIOR TO SOIL DISTURBING ACTIVITIES.

2. AT THE COMPLETION OF EACH PHASE, COORDINATE WITH THE RPR AND AIRPORT TO RE-OPEN THE PAVEMENT AREAS FOLLOWING THE STEPS BELOW

2.1 ENSURE THERE ARE NO OPEN TRENCHES IN OR ADJACENT TO THE PAVEMENT AREAS
2.2 REMOVE PHASE LIMITS OF WORK AREA STAKES
2.3 REMOVE ALL EQUIPMENT, EROSION CONTROL DEVICES, MATERIALS AND PERSONNEL FROM THE WORK AREA
2.5 CANCEL NOTAMS

3. THE CONTRACTOR WILL BE REQUIRED TO RESTORE THE HAUL ROUTE AREAS.

PHASE NOTES.

PHASE 1.
1. WORK ACTIVITIES WITHIN WORK LIMITS FOR THIS PHASE SHALL INCLUDE.
1.1. CONSTRUCT THE LANDING AT PEARLAND

Point Table

Point #	Raw Description	Elevation	Northing	Easting	Latitude	Longitude
1	LOC	36.20	13757671.6356	3164547.8731	N29° 31' 30.06"	W95° 14' 17.94"
2	LOC	37.79	13757437.8147	3164336.2697	N29° 31' 28.00"	W95° 14' 20.16"
3	LOC	39.17	13757325.7295	3164504.2508	N29° 31' 26.85"	W95° 14' 18.56"
4	LOC	35.44	13756695.3045	3163941.4927	N29° 31' 20.59"	W95° 14' 25.15"
5	LOC	36.54	13756325.2396	3163997.7618	N29° 31' 16.91"	W95° 14' 24.65"
6	LOC	41.06	13755982.5403	3164051.3218	N29° 31' 13.30"	W95° 14' 24.18"
7	LOC	39.68	13755409.5286	3164471.6987	N29° 31' 07.69"	W95° 14' 19.62"
8	LOC	39.09	13755750.1655	3164773.7762	N29° 31' 10.97"	W95° 14' 16.06"
9	LOC	39.25	13755635.4275	3164904.3097	N29° 31' 09.79"	W95° 14' 14.65"
10	LOC	39.17	13755809.8745	3165060.0338	N29° 31' 11.47"	W95° 14' 12.82"
11	LOC	36.66	13755619.9733	3165272.7871	N29° 31' 09.52"	W95° 14' 10.46"
12	LOC	37.36	13755948.3612	3165564.1247	N29° 31' 12.86"	W95° 14' 07.07"
13	LOC	37.02	13755923.0705	3165587.9752	N29° 31' 12.44"	W95° 14' 06.81"
14	LOC	37.26	13756006.3306	3165685.9962	N29° 31' 13.25"	W95° 14' 05.69"
15	LOC	38.27	13756317.8882	3165651.3214	N29° 31' 16.31"	W95° 14' 05.96"
16	LOC	38.45	13756384.9910	3165570.0621	N29° 31' 17.00"	W95° 14' 06.77"
17	LOC	37.32	13756390.1429	3165739.1955	N29° 31' 16.97"	W95° 14' 04.63"
18	CLUBHOUSE	39.30	13756962.9318	3165034.1067	N29° 31' 22.69"	W95° 14' 12.68"
19	CLUBHOUSE	39.21	13756902.3669	3165101.9311	N29° 31' 22.27"	W95° 14' 11.95"
20	CLUBHOUSE	39.41	13756861.2934	3165065.2480	N29° 31' 21.67"	W95° 14' 12.38"
21	CLUBHOUSE	40.64	13756921.8384	3164997.4237	N29° 31' 22.49"	W95° 14' 13.12"
22	CLUBHOUSE	38.97	13756940.2071	3165013.4976	N29° 31' 22.75"	W95° 14' 12.93"
23	CLUBHOUSE	39.29	13756881.8132	3165088.0954	N29° 31' 22.07"	W95° 14' 12.11"
24	PAVILION	40.10	13756731.8705	3164940.1561	N29° 31' 20.63"	W95° 14' 13.84"
25	PAVILION	40.05	13756789.2039	3164973.2620	N29° 31' 20.99"	W95° 14' 13.45"
26	PAVILION	42.48	13756820.0444	3164916.3769	N29° 31' 21.51"	W95° 14' 14.06"
27	PAVILION	42.71	13756782.5019	3164883.1753	N29° 31' 21.15"	W95° 14' 14.47"
28	MAINTENANCE	35.78	13756746.8465	3164091.7311	N29° 31' 21.03"	W95° 14' 23.43"
29	MAINTENANCE	36.81	13756794.2130	3164036.7906	N29° 31' 21.93"	W95° 14' 24.02"
30	MAINTENANCE	36.33	13756700.8329	3163955.5562	N29° 31' 20.64"	W95° 14' 24.99"
31	MAINTENANCE	39.10	13756653.5190	3164005.3631	N29° 31' 20.15"	W95° 14' 24.41"
32	WATER TREAT	42.48	13756231.9075	3165126.9578	N29° 31' 15.82"	W95° 14' 11.91"
33	WATER TREAT	42.48	13756178.3253	3165078.4381	N29° 31' 15.09"	W95° 14' 12.50"
34	WATER TREAT	42.48	13756106.3517	3165151.6315	N29° 31' 14.40"	W95° 14' 11.66"
35	WATER TREAT	42.43	13756165.2018	3165201.0550	N29° 31' 14.94"	W95° 14' 11.10"

LEGEND

- CONTRACTOR'S STAGING AREA
- LOC — LIMITS OF CONSTRUCTION
- HAUL ROUTE
- RSA — RUNWAY SAFETY AREA
- TSA — TAXIWAY SAFETY AREA

THE LANDING AT PEARLAND PHASING PLAN

PEARLAND REGIONAL AIRPORT DETENTION POND PEARLAND, TEXAS

KSA

FAA Docket 16-22-06

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

EXHIBIT E

Letter from Odyssey Pilot Hours

ODYSSEY
PILOT HOURS

Odyssey Pilot Hours

Hi there Stephen,

Today, I am writing you to discuss The Landing at Pearland Airport. We are very excited about this coming development to the Pearland airport community.

My company, Odyssey Pilot Hours, is dedicated to providing a premier experience to pilots, building their logbooks for the airlines. We specialize in renting small, highly efficient and technological, aircraft to aspiring commercial pilots. Our program takes pilots from all over, and gives them access to aircraft nearly 24 hours a day, as well as a place to stay while completing the mission.

This is where The Landing comes in. This community development is perfect for our operation; it gives pilots a great place to relax and enjoy amenities such as the variety of sport courts, and indoor gym. This encourages a healthy lifestyle to our clients, and surrounding neighbors.

The Landing offers everything the Pearland airport is looking for in a neighboring development, well-kept facilities, safe environment, business opportunities for local establishments, and more.

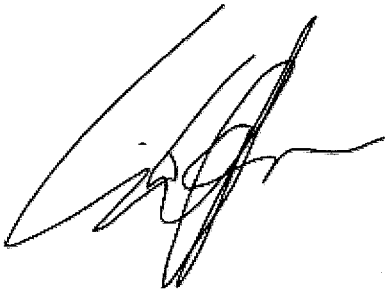
I can only speak for myself, when I say The Landing was an integral part of our desire to close on our hangar at Pearland Airport. Having a healthy, clean place for our pilots to stay, is a requirement of locations for our business. We are very much looking forward to the project, and the steps towards completion.

Thank you, blue skies

Date: Feb 20, 2023

Owner and Founder,

Louis Connor Effron



FAA Docket 16-22-06

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

EXHIBIT F

Drainage Easement and Maintenance Agreement

DRAINAGE EASEMENT
AND
MAINTENANCE AGREEMENT

STATE OF TEXAS §
§ **KNOW ALL MEN BY THESE PRESENTS:**
COUNTY OF BRAZORIA §

THIS DRAINAGE EASEMENT AND MAINTENANCE AGREEMENT (the "**Agreement**") is made this 10th day of May, 2022 by and between Clover Acquisition Corp., a Texas corporation ("**Grantor**") and The Landing at Pearland, Ltd., a Texas Limited Partnership ("**Grantee**"). Grantor and Grantee shall be collectively referred to herein as the "**Parties.**"

RECITALS

A. Grantor is the owner of the real property being Lot 2 in Block 1 of Clover Airport Acres, a subdivision in Brazoria County, Texas, according to the map or plat thereof recorded in Clerk's File No. 2022026010 of the Official Public Records of Brazoria County, Texas, described on Exhibit A attached hereto and fully incorporated herein ("**Lot 2**"). Grantee is the owner of the adjoining real property being Lot 1 in Block 1 of Clover Airport Acres, a subdivision in Brazoria County, Texas, according to the map or plat thereof recorded in Clerk's File No. 2022026010 of the Official Public Records of Brazoria County, Texas, described on Exhibit A ("**Lot 1**"). The foregoing Lot 1 and Lot 2 shall be referred to collectively as the "**Properties**").

C. Grantor owns and operates Lot 2, among other interrelated tracts of land for purposes of providing regional detention of surface water ("**Regional Detention**") for its property and adjoining properties (individually an "**Adjacent Property**" and collectively, the "**Adjoining Properties**") owned and operated by Grantor and by third parties who presently utilize or will in the future utilize such Regional Detention facilities as Grantor may provide. Grantee intends to construct a multi-family development including housing and related amenities upon Lot 1 (the "**Project**"). The Project will require adequate improvements to accommodate surface water drainage and detention which will be constructed by Grantee upon Grantor's Lot 2 (the "**Drainage Improvements**").

D. In connection with its construction of the Drainage Improvements, Grantee will construct various improvements upon Lot 2 in the approximate locations shown on Exhibit B attached hereto and incorporated herein for all purposes to connect the Project and the Drainage Improvements to Grantor's Regional Detention system and facilities located on Grantor's Adjacent Properties (the "**Construction**"). The Construction includes, and is not limited to all required Drainage Improvements to serve the Project, as the same are generally depicted in Exhibit B and in all engineering construction documents prepared by KSA Consulting Engineers in conjunction with WGA Consulting Engineers.

E. In order to permit the construction and operation of the Drainage Improvements for the Project, Grantor agrees to grant Grantee: (i) a temporary construction easement (the

"**Temporary Construction Easement**") on Lot 2 for the construction of the Drainage Improvements; and (ii) a permanent non-exclusive detention easement in and upon Lot 2 ("**Drainage Easement**") to provide Grantee with adequate drainage and detention capacity for the Project.

NOW THEREFORE, in consideration of the terms of this Agreement and for other good and valuable consideration, the receipt and sufficiency of which are hereby accepted, is hereby declared that in furtherance of the foregoing intent and purposes as follows:

ARTICLE 1
COVENANTS AND CONDITIONS

1.1 Construction of the Project and the Drainage Improvements. Except as otherwise expressly provided herein Grantee or any owner of Lot 1, as the case may be, shall be solely responsible for the performance of all actions and payment of all costs and expenses associated with the construction of the Project, including the Drainage Improvements upon Lot 2, and subsequent development that such owner may elect to undertake on Lot 1.

1.2 Operation, Management, and Maintenance of the Project. Grantee shall be responsible at its sole expense for the operation, management, and maintenance of the Project, including the Drainage Improvements it constructs upon Lot 2. Subject to the rights of Grantee, to develop, demolish, and re-develop the Project and Lot 1, including the Drainage Improvements and Lot 1 as it deems appropriate, all operation, management, and maintenance of the Project, including the Drainage Improvements shall be in accordance with this Agreement and with applicable law. Grantee shall keep and maintain the Project, including the Drainage Improvements upon Lot 2 at all times in good, clean, and attractive, condition and repair.

1.3 Operation, Management, and Maintenance of Grantor's Adjoining Properties. Grantor shall construct, maintain, and operate upon Grantor's other Adjoining Properties such drainage improvements as are required to fulfill Grantor's obligation and purpose of providing regional detention to the Adjoining Properties. Said obligation includes, but is not limited to compliance with such terms as apply from time to time to the Adjoining Properties and as may be imposed by local governmental authorities, including, but not limited to Brazoria Drainage District No. 4, a conservation and reclamation district and political subdivision of the State of Texas for the operation of any and all required drainage and detention improvements on the Adjoining Properties.

1.4 Rules and Regulations. Grantor may from time to time adopt and promulgate in writing such reasonable "**Rules and Regulations**" pertaining to the operation and management of the Drainage Improvements as are reasonably required to meet Grantor's obligations to provide Regional Detention, provided the same do not interfere with construction, operation, management, maintenance and/or redevelopment of the Project on Lot 1 and its related Drainage Improvements on Lot 2, or with Grantee's rights hereunder.

ARTICLE 2
CREATION OF EASEMENTS

2.1 Temporary Construction Easement. Grantor hereby grants to Grantee a non-exclusive, temporary easement in and upon Lot 2 for the purpose of Construction of the Drainage Improvements together with pedestrian and vehicular ingress and egress over and across Lot 2 and with such portions of the Grantor's Property as is reasonably necessary to permit the Construction (the "**Temporary Construction Easement**"). To facilitate Grantee's Construction Grantor agrees to allow Grantee and its contractors and agents to enter Lot 2 on a temporary basis pursuant to the terms of this Agreement. Upon completion of the Construction, the Temporary Construction Easement shall terminate and be of no further force or effect.

2.2 Drainage Easement. Grantor hereby GRANTS AND CONVEYS TO GRANTEE a nonexclusive drainage easement upon, over, across and through Lot 2 (the "**Easement Area**"). The easement rights and privileges herein granted shall be used only for the purposes of constructing, operating, maintaining, repairing, replacing and reconstructing of the Drainage Improvements and such additional improvements as may be necessary from time-to-time for the productive use and redevelopment of Lot 1, now and in the future, and any and all related equipment and facilities together with any and all necessary incidentals and appurtenances thereto in, upon, over, across and through the Easement Area. Subject to the foregoing and subsequent provisions hereof, Grantee, its successors, assigns, agents, employees, workmen and representatives shall, at all present and future times, have the right and privilege of ingress and egress in, upon, over, across and through the Easement Area for the purposes hereof (the foregoing described herein as the "**Drainage Easement**") TO HAVE AND TO HOLD said Drainage Easement for the foregoing purposes, together with all and singular, the rights, privileges, and appurtenances thereto as described above in anywise belonging to the said Grantee, its successors and assigns forever, subject to the conditions and limitations set forth hereinbelow.

2.3 Conditions to Drainage Easement. The Drainage Easement shall be subject to and governed by the following provisions:

a. The Drainage Easement rights and privileges granted herein are non-exclusive, and the Grantor reserves and retains the right to convey, plat and/or dedicate similar rights and easements, as well as other types of rights and easements, to such other persons or entities as Grantor may deem proper, providing such other conveyances do not materially affect Grantee's use of the easement conveyed herein. Notwithstanding the foregoing, Grantor, for itself, its successors and assigns covenants at all times not to grant such rights and privileges to such third parties as might materially interfere with Grantees' use, and development of Lot 1 for the purposes set forth herein and for such other and further purposes as are consistent with this Agreement.

b. The Drainage Easement rights and privileges herein granted shall be subject to encumbrances, conditions, covenants, restrictions, reservations, exceptions, rights-of-way and easements of record, including building and zoning ordinances, all laws, regulations, and restrictions by municipal or other governmental authority applicable to and enforceable against Lot 1 and Lot 2.

c. The grant made hereunder is not a conveyance of the Easement Area nor of any interest in the oil, gas, and other minerals in, on, or under the land subject to easement herein granted, but is a grant solely of the Drainage Easement as above described.

d. Grantor and its successors and assigns may not place buildings, structures, or improvements including driveways, fences, landscaping, sidewalks, and any structure that in Grantee's reasonable opinion could impede the flow of storm water or interfere with Grantee's construction or maintenance activities, within the Easement Area, or otherwise impair the Drainage Easement.

e. Grantor may permit a third party to utilize the Easement Area and to encroach upon the Easement Area with the construction of sidewalks, trails or other facilities. Any such encroachment must be approved by Grantee, which approval shall not be unreasonably withheld, conditioned or delayed, prior to construction and will be evidenced by a separate Consent to Encroachment instrument, if Grantor and Grantee recognize the need for such additional documentation. Grantee shall not be responsible for maintenance or repair of any facilities constructed by Grantor or third parties and constructed within the Easement Area; Grantee shall have no liability for damages to such facilities which may occur while Grantee exercises its rights granted in the Easement Area and Grantee shall have no obligation to indemnify Grantor hereunder for losses, claims, or damages resulting from the construction or operation of such additional facilities.

2.4 Limitations on Easements. The Easements are granted subject to the following conditions:

a. The rights of Grantee to reasonably relocate, redefine and/or demolish the Drainage Improvements covered by the Easements, for the purpose of constructing, developing, re-developing and operating the Project provided such actions do not interfere with Grantor's Regional Detention and/other rights granted to third parties not in conflict with this Agreement;

b. The rights of Grantor to subsequently develop, demolish and/or redevelop any portion of the Grantor Property for whatever purposes or uses Grantor chooses provided such actions do not interfere with Grantee's Drainage Improvements and other rights hereunder or otherwise conflict with this Agreement;

c. The right of Grantor to designate and/or grant any and all easements, licenses or other rights which in its sole discretion are deemed necessary for the development, operation or redevelopment of facilities required for its Regional Detention provided such easements, licenses or other rights do not prevent the use and enjoyment of Easements granted to Grantee herein or otherwise conflict with this Agreement; and

d. The right of Grantor to impose and enforce Rules and Regulations pursuant to paragraph 1.4 and other applicable provisions hereof.

2.5 Easements Appurtenant. The Temporary Construction Easement and the Drainage Easement (collectively, the "Easements") and rights described herein are easements appurtenant, running with the land, and shall inure to the benefit of and be binding on the Grantor and the

Grantee and their respective successors. Nothing contained herein is intended to create or grant an easement in gross. The Easements shall be used and enjoyed pursuant and subject to the terms and conditions of this Agreement.

2.6 Easement Area. It is the express understanding of the parties that it may be necessary, upon sufficient completion of the design and construction of the Project, that the boundaries of the Drainage Easement and the improvements constructed by Grantee be fixed. In this regard, Grantor shall provide such depictions as are reasonably required to accurately fix the boundaries of the improvements constructed within the Drainage Easement, to the extent said boundaries are necessary for Grantor's obligations to provide Regional Detention. The Parties shall execute and deliver an amendment to this Agreement in recordable form and such amendment shall be recorded in the Official Public Records of Brazoria County, Texas, and/or other applicable records, at Grantor's expense so stating and fixing the boundaries of said improvements. The parties stipulate that any failure to describe the exact location of the Drainage Easement and/or the related improvements shall not affect the validity of the Drainage Easement and neither Party shall argue that the Drainage Easement fails for lack of an adequate description.

ARTICLE 3
GENERAL PROVISIONS

3.1 Covenants Running with the Land – Easement Appurtenant. This Agreement and all Easements granted herein shall constitute covenants running with the land. All Easements granted herein are appurtenant and shall not be deemed in gross.

3.2 Successors and Assigns - Binding Effect. This Agreement shall be binding on the Parties and their respective heirs, executors, administrators, successors and permitted assigns. The terms of this Agreement shall inure to the benefit of and be enforceable by the Parties and their respective legal representatives, successors and permitted assigns. No Party shall be entitled to assign its rights or obligations under this Agreement independent of such Party's fee interest in Lot 1 or Lot 2, as applicable.

3.3 Rights of Lenders and Others. Each of the Easements shall be superior to all other encumbrances which may hereafter be applied against the Grantor Property or any portion thereof. This Agreement is superior and senior to any lien, mortgage, or deed of trust placed on Lot 1 or Lot 2 or a portion of either parcel. A duplicate copy of any and all notices either Party may give to or serve on the other Party pursuant to or related to this Agreement, must be mailed, pursuant to the notice provisions hereof, to a lender for the affected parcel, if the Party or its lender has given a written request for notices to the noticing Party containing the lender's name, address, and a description of the lender's security interest in the parcel.

3.4 Recordation. The Grantee shall record this Agreement in the Official Public Records of Brazoria County, Texas.

3.5 Default; Remedies. The failure to observe or perform any of the covenants, conditions or obligations of this Agreement by a non-performing Party ("**Defaulting Party**") and cure such failure within thirty (30) days after the issuance of a written notice by another Party (the

"**Non-Defaulting Party**") specifying the nature of the default claim shall constitute a default and breach of this Agreement.

3.5.1 Each Non-Defaulting Party shall have the right to prosecute any proceedings at law or in equity against any Defaulting Party hereto, or any other person, violating or attempting to violate or default upon any of the provisions contained in this Agreement. Such proceedings shall include the right to restrain by injunction any violation or threatened violation by another of any of the terms, covenants or conditions of this Agreement, or to obtain a decree to compel performance of any such terms, covenants or conditions. All of the remedies permitted or available to a Party under this Agreement or at law or equity shall be cumulative and not alternative, and election of any such right or remedy shall not constitute a waiver or election of remedies with respect to any other permitted or available right or remedy.

3.6 Acceptance by Grantees - Easements Deemed Granted and Reserved. Each future grantee by the acceptance of a deed or other conveyance accepts the same subject to all covenants, restrictions, easements, rights, and powers created by this Agreement, and all rights described in this Agreement. Lot 1 and Lot 2 shall be held, sold, conveyed, and occupied subject to the easements, covenants and conditions set forth herein, which shall run with the land and shall be binding on all parties having any right, title and interest in or to Lot 1 and Lot 2 or any part thereof, their successors, and assigns, and shall inure to the benefit of each owner thereof. Each contract or deed which may hereafter be executed by Grantor and Grantee and/or any future owner with regard to Lot 1 and Lot 2 or any part thereof shall conclusively be held to have been executed, delivered, and accepted subject to this Easement, to all conditions and limitations referenced herein and to any amendment or supplement thereto, regardless of whether or not the same are set out or referred to in said contract or deed.

3.7 Indemnity by Grantee. Except as provided herein, Grantee shall be solely responsible for the design, construction operation, maintenance and repair of the Drainage Improvements constructed by Grantee within the Easement Area, and any damages resulting from the activities of Grantee hereunder or the use of the Easement Area or any other portion of Grantor's Property by Grantee, or Grantees employees, agents, contractors, customers, or invitees. Grantee shall indemnify Grantor, in accordance with and subject to the limitations of applicable law, against any loss and damage which shall be caused by the exercise of the rights granted under this Agreement or by any wrongful or negligent act or omission of Grantee's and Grantee agents, employees or contractors in the course of their employment unless the liability is caused by the negligence or willful act or omission of Grantor, or its occupants, agents, employees or third parties.

3.8 Indemnity by Grantor. Grantor shall be solely responsible for the design, construction operation, maintenance and repair of all improvements providing Regional Detention and any damages resulting from the activities of Grantor and Grantor's employees, agents, contractors, customers, or invitees related to the provision of Regional Detention. Grantor shall indemnify Grantee, in accordance with and subject to the limitations of applicable law, against any loss and damage which shall be caused by the exercise of the rights granted under this Agreement or by any wrongful or negligent act or omission of Grantor and Grantor's agents, employees or contractors in the course of their employment unless the liability is caused by the negligence or willful act or omission of Grantee, or its occupants, agents, employees or third parties.

3.9 Insurance. The Parties shall at all times during the term hereof maintain the following forms of insurance:

3.9.1 Property and Casualty Insurance. The Parties shall keep the Project and its Drainage Improvements insured against loss or damage by casualty including damage from such risks or hazards of a similar or dissimilar nature which are now or may hereafter be customarily insured against with respect to improvements similar in construction, design, general location, and use.

3.9.2 Commercial General Liability Insurance. The Parties shall maintain comprehensive commercial general public liability insurance covering the Easement Area and any improvements therein, insuring against risks of bodily injury, property damage and personal injury liability with respect to incidents occurring on such tract, with an initial limit of not less than $1,000,000.00 combined single limit per occurrence. Such minimum amounts of coverage shall be periodically adjusted as reasonable to reflect the coverages of commercial properties in Texas, and inflation.

3.9.3 Subrogation. The Parties each hereby waive on behalf of any insurer providing insurance to such Parties, any right of subrogation which such insurer might otherwise acquire against the other Parties or the shareholders, partners, officers, directors, or employees of either Party by virtue of losses to either Party. Each Party also expressly waives any and every claim which arises or may arise in such Party's favor against the other Party and such Party's shareholders, partners, officers, and employees during the term of this Agreement for any and all loss of or damage to any of such Party's property, located within or upon, or constituting a part of, the Easement Area which loss or damage is caused by a peril required by this Agreement to be covered by the insurance of the Party incurring the loss or, if greater, to the extent of the recovery under any insurance policy covering the Party incurring the loss. Inasmuch as the mutual waivers in this paragraph will preclude the assignment of any claim by way of subrogation (or otherwise) to an insurance company (or any other party), each Party shall give to each insurance company which has issued to such Party policies of property insurance, written notice of the terms of the mutual waivers of subrogation and have such insurance policies properly endorsed, if necessary, to prevent the invalidation of the insurance coverages by reason of such waivers.

3.10 Waiver of Consequential Damages. The Parties each waive consequential damages for losses, costs, claims, damages, disputes or other matters in question arising out of or relating to this Agreement. As a material inducement to this Agreement, the Parties agree that no personal liability of any kind or character whatsoever now attaches or at any time hereafter under any conditions shall attach to any partners or shareholders, officers, directors, or employees of the Parties for payment of any claims, liability, causes of action, losses, costs, damages, or other amounts due under this Agreement, or for the performance or nonperformance of any obligation under this Agreement or otherwise related hereto.

3.11 Notices. All notices or requests required or permitted hereunder shall be in writing and given by: (a) personal delivery to the addressee; (b) depositing the same in the United States mail, properly addressed to the Parties to be notified, postpaid, and registered or certified with return receipt requested; (c) deposit with a nationally recognized overnight delivery service such as Federal Express; and (d) e-mail or facsimile (fax) transmission; provided the Parties to whom

the fax is addressed has designated an e-mail address and/or a facsimile number below and the sending Party has a fax generated verification of the date and time of transmission and the fax number to which notice was sent. Notices shall be deemed received on transmission and/or deposit with the given delivery service. Notices to either of the Parties shall be sent to the addresses set forth herein, or at any other address specified in writing (and effective pursuant to the foregoing notice requirements) by the Parties hereto from time to time.

Notices to Grantor:

Clover Acquisition Corp.
166 Hargraves Drive, Suite C400-536
Austin, Texas 78737
Attention: Stephen D. Alexander, President
Email: salexander@texasaviationpartners.com

With Required Copy To:

Jeff Wells
10223 Broadway Street, Suite P-347
Pearland, Texas 77584
E-mail: Jeff@wellslawfirm.com

Notices to Grantee:

The Landing at Pearland, Ltd.
2000 West Parkland Avenue
Friendswood, Texas 77546
Attention: Jeff Mickler
Email: jeff@mickler.com

With Required Copy To:

Dunagan | Childs
248 Addie Roy, Drive, Suite B-204
Austin, Texas 78746
Attention: Kevin Childs
E-mail: kchilds@dunaganchilds.com

3.12 Not a Public Dedication. The Parties agree that no part of Lot 1 or of Lot 2 is, or during the term of this Agreement shall be, in the public domain, and that nothing contained herein shall be deemed to be a gift or dedication of any portion of said property to the general public or for the use of the general public or for any public purpose whatsoever.

3.13 Entire Agreement. This Agreement constitutes the entire agreement of the Parties pertaining to the subject matter contained herein and supersedes all prior and contemporaneous agreements, representations and understandings of the Parties. Any supplement, modification, or amendment of this Agreement must be in writing.

3.14 Applicable Law. This Agreement hall be construed in accordance with, and governed by, the internal laws of the State of Texas. This Agreement is performable in Brazoria, County, Texas.

3.15 Severability. If any provision of this Agreement is held to be illegal, invalid or unenforceable under present or future laws, such provision shall be fully severable, and this Agreement shall be construed as if such illegal, invalid or unenforceable provision had never been a part of this Agreement. The remaining provisions of this Agreement shall remain in full force and effect and shall not be affected by the illegal, invalid or unenforceable provision or by its severance from this Agreement. Furthermore, in lieu of such illegal, invalid or unenforceable provision there shall be added automatically as part of this Agreement a provision that is as similar in terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid or enforceable.

3.16 Waiver; Rights Cumulative. No failure or delay on the part of any Party in exercising any right, power or privilege hereunder and no course of dealing with the terms hereto shall operate as a waiver thereof; nor shall any single or partial exercise of any right, power or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, power or privilege. The rights and remedies provided herein are cumulative and not exclusive of any other rights or remedies which any Party may have at law or in equity or otherwise.

3.17 Negation of Agency Relationship, Joint Venture, or Partnership. Nothing contained herein shall be deemed or construed as creating the relationship of principal and agent or partnership or joint venture between the Parties.

3.18 Captions. The captions and headings employed in this Agreement are for convenience only and are not intended to, in any way, limit or amplify the terms and provisions of this Agreement.

3.19 Time is of the Essence. Time is of the essence in this Agreement.

3.20 Force Majeure. No Party shall be deemed to be in default of its covenant or obligation contained in any provision of this Agreement for so long as the performance of such obligation or covenant is prevented or delayed by acts of God, casualty, actions of the elements, floods, explosions, declared or undeclared war, insurrection, laws or order of any governmental authority or authorities.

3.21 Further Actions. From time to time, as and when requested by either Party, the other Party shall execute and deliver, or cause to be executed and delivered, such documents and instruments and shall take, or cause to be taken, such further or other actions as may be reasonably necessary to effectuate the agreements and covenants made in this Agreement and all transactions contemplated by this Agreement.

3.22 Fair Construction. The parties hereby agree that they have had the opportunity to be represented by legal counsel in connection with the negotiation and execution of this Agreement, including all Exhibits attached hereto, and any related agreements and documents executed in connection herewith, and this Agreement, including all Exhibits attached hereto, and

any such related agreements and documents shall be interpreted according to their fair construction and shall not be construed against either Party.

3.23 Estoppel Certificates. Recognizing that the Parties may find it necessary from time to time to establish to lenders, mortgagees, accountants, or other parties of the then current status of the performance hereunder, each Party agrees, within ten (10) days of written request, that it will from time to time, with reasonable promptness, furnish a written statement in recordable form that this Agreement remains in full force and effect, or indicating any rights that have been terminated hereunder, that no Party is in default hereunder, and any matter reasonably requested by the other Parties, its prospective purchaser or mortgagee relating to this Agreement.

3.24 Counterparts. This Agreement may be executed in several counterparts, each of which when so executed and delivered, shall be deemed an original and all of which, when taken together, shall constitute one and the same instrument, even though all Parties are not signatories to the original or the same counterpart. The Parties may execute and deliver this Agreement by electronic means (including by facsimile, Portable Document Format (".pdf") transmission, DocuSign, or similar format). The Parties agree that the delivery of the Agreement by electronic means will have the same force and effect as delivery of original signatures and that each of the Parties may use such electronic signatures as evidence of the execution and delivery of the Agreement by all Parties to the same extent as an original signature.

[Signature Pages Follow]

EXECUTED TO BE EFFECTIVE as of the date first set forth above:

GRANTOR:

CLOVER ACQUISITION CORP.,
a Texas corporation

By: _____
Name: Stephen D. Alexander
Title: President

STATE OF TEXAS)
)
COUNTY OF ~~TRAVIS~~ HAYS)

This instrument was acknowledged before me on May 11, 2022 by Stephen Alexander, President of Clover Acquisition Corp., a Texas corporation, on behalf of said corporation.

[SEAL]

JANICE JOHANNA CASKEY
NOTARY PUBLIC
STATE OF TEXAS
ID 131709980
EXP. 09/05/2022

_____
Notary Public in and for the State of Texas

[signatures continue on next page]

GRANTEE:

THE LANDING AT PEARLAND, LTD.,
a Texas limited partnership

By: The Landing at Pearland GP, LLC,
a Texas limited liability company,
its general partner

By: _____
Name: Jeff Mickler
Title: manager

STATE OF TEXAS)
)
COUNTY OF TRAVIS)

This instrument was acknowledged before me on May 10, 2022 by Jeff Mickler, Manager of The Landing at Pearland, GP, LLC, the General Partner of the Landing at Pearland, Ltd., a Texas Limited Partnership, on behalf of said entity.

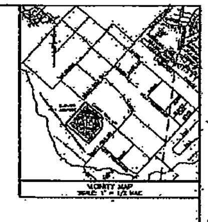
DIANA FRIAS
My Notary ID # 131850353
Expires January 10, 2023

[SEAL]

_____
Notary Public in and for the State of
Texas

Exhibit A

Plat



FINAL PLAT

CLOVER AIRPORT ACRES

A SUBDIVISION OF A 33.138 ACRE TRACT
OF LAND BEING OUT OF
LOTS 30, 46, 48, 47, 48, 49, 50, 65, 66, AND 67,
WEST FRIENDSWOOD SUBDIVISION
(VOL. 1, PG. 96; B.C.M.R.)
IN THE JAMES F. PERRY & EMILY AUSTIN LEAGUE,
ABSTRACT NO. 111,
BRAZORIA COUNTY, TEXAS

1 BLOCK ~ 2 LOTS

~ OWNERS ~

THE LANDING AT PEARLAND, LTD	CLOVER ACQUISITION CORPORATION
a Texas limited partnership	a Texas corporation
2800 West Parkwood, Suite 100	166 Hargraves Drive, Suite C400-536
Friendswood, Texas 77546	Austin, Texas 78737

~ SURVEYOR ~

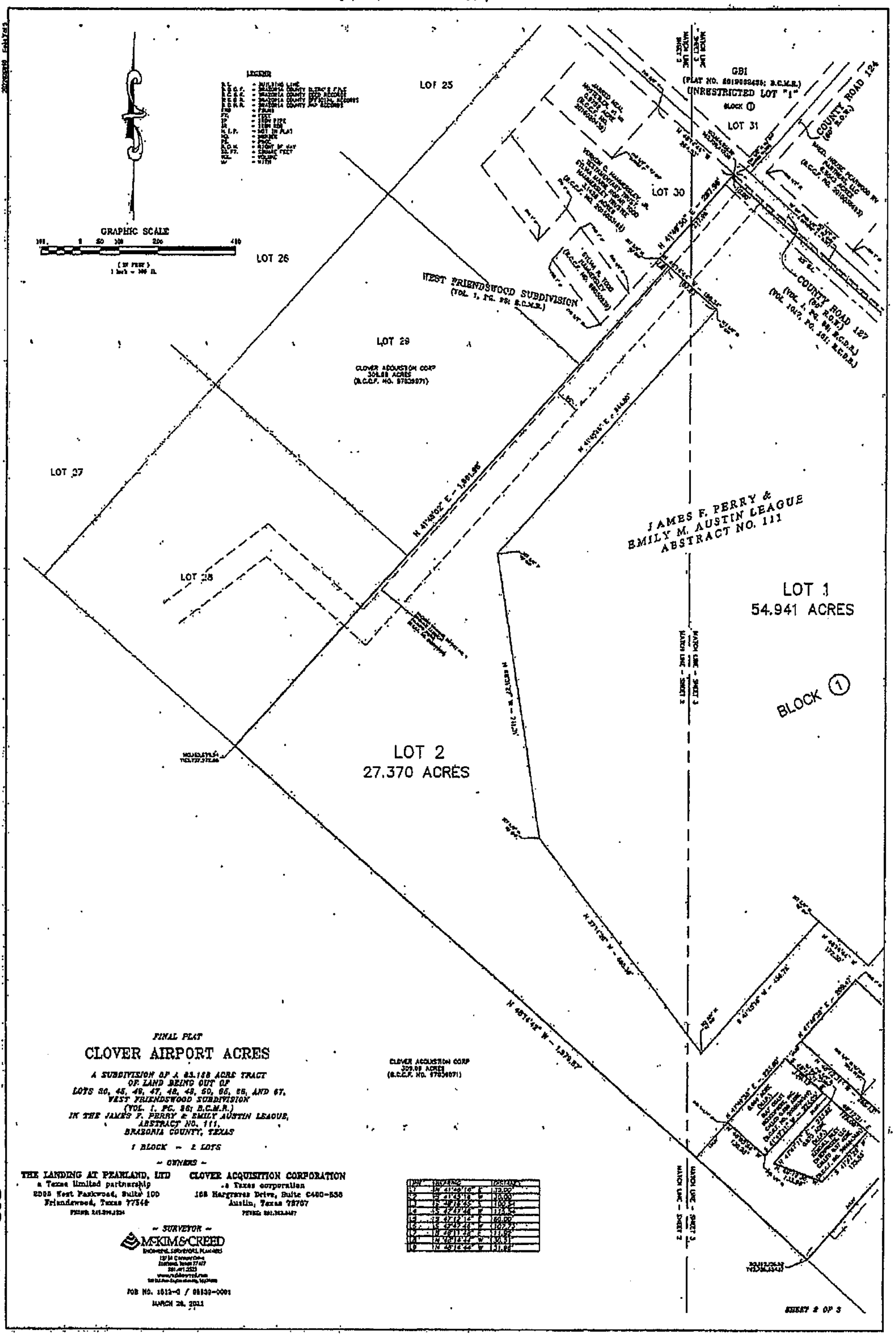
McKIM&CREED

JOB NO. 1813-S / 06530-0001

MARCH 23, 2022

SHEET 1 OF 3

F22-00010


LOT 25
LOT 26
LOT 27
LOT 28
LOT 29
LOT 30
LOT 31
GRAPHIC SCALE
WEST FRIENDSWOOD SUBDIVISION
COUNTY ROAD 124
COUNTY ROAD 127
JAMES F. PERRY &
EMILY M. AUSTIN LEAGUE
ABSTRACT NO. 111
LOT 1
54.941 ACRES
BLOCK ①
LOT 2
27.370 ACRES
FINAL PLAT
CLOVER AIRPORT ACRES
A SUBDIVISION OF A 83.188 ACRE TRACT
OF LAND BEING OUT OF
LOTS 30, 45, 46, 47, 48, 49, 50, 65, 66, AND 67,
WEST FRIENDSWOOD SUBDIVISION
(VOL. 1, PG. 86; B.C.M.R.)
IN THE JAMES F. PERRY & EMILY AUSTIN LEAGUE,
ABSTRACT NO. 111,
BRAZORIA COUNTY, TEXAS
1 BLOCK – 2 LOTS
– OWNERS –
THE LANDING AT PEARLAND, LTD
a Texas limited partnership
2005 West Parkwood, Suite 100
Friendswood, Texas 77546
CLOVER ACQUISITION CORPORATION
a Texas corporation
168 Hargraves Drive, Suite C400-538
Austin, Texas 78707
– SURVEYOR –
McKIM&CREED
JOB NO. 1012-0 / 08130-0001
MARCH 28, 2011
CLOVER ACQUISITION CORP
309.08 ACRES
SHEET 2 OF 3

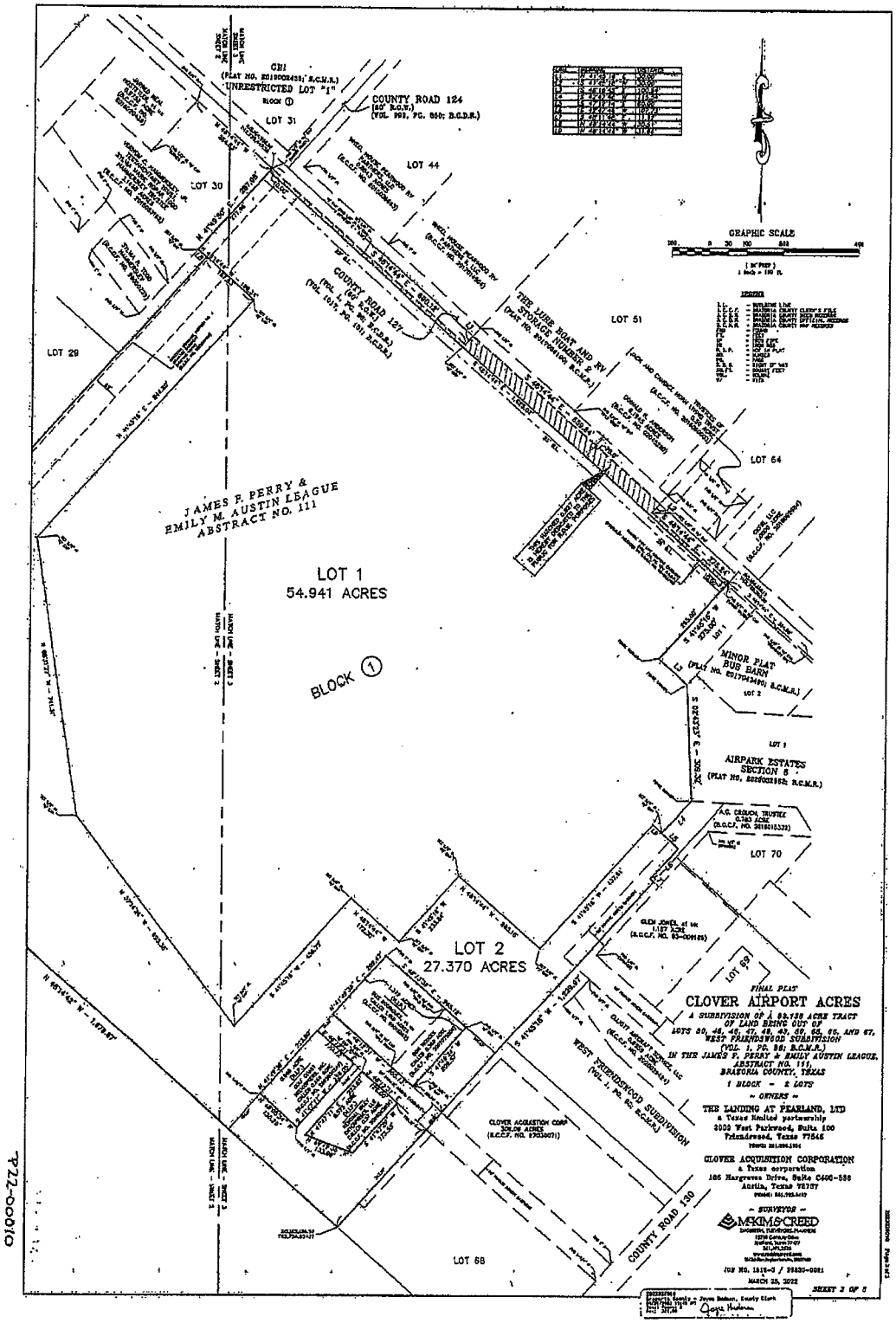
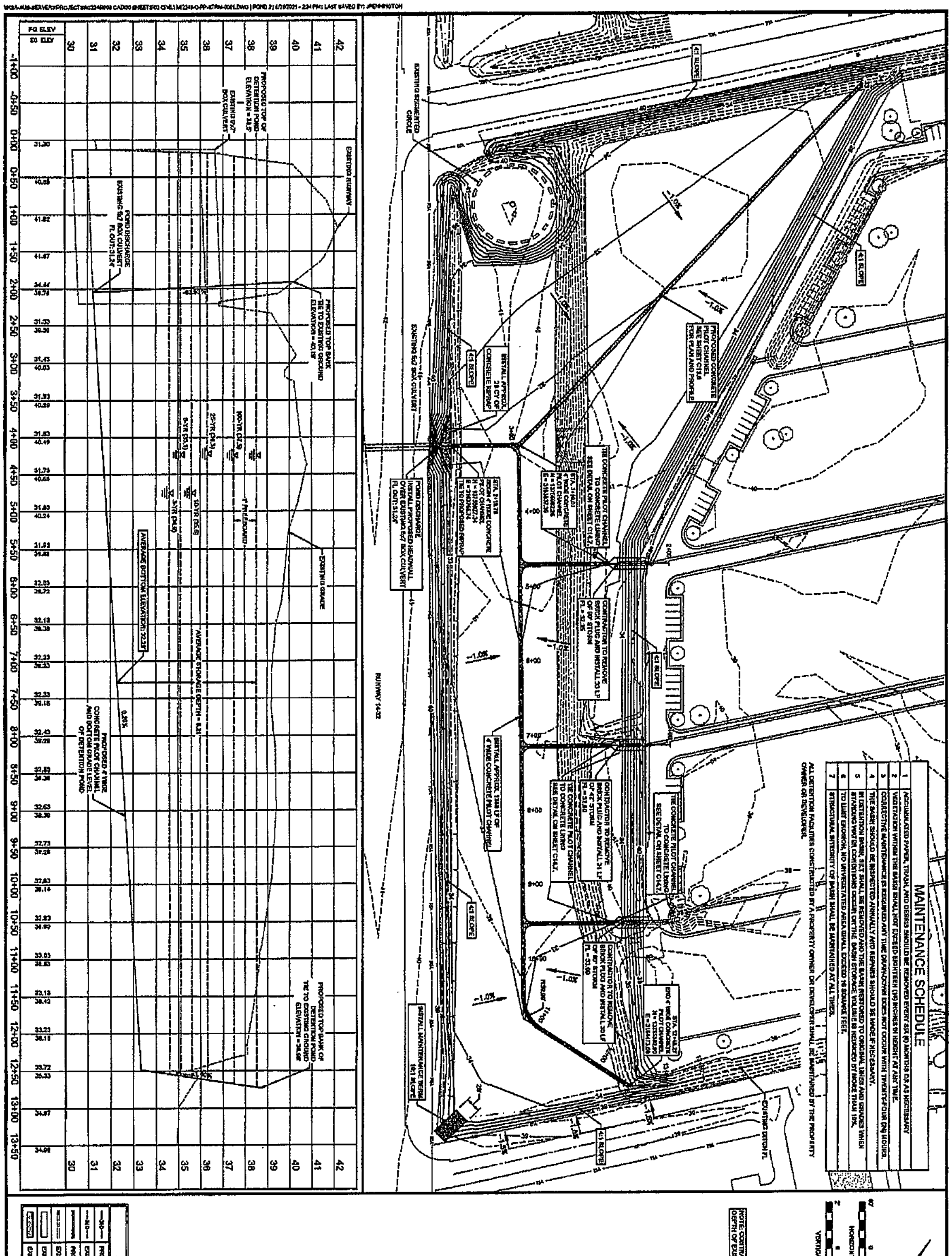

LOT 1
54.941 ACRES
BLOCK 1
LOT 2
27.370 ACRES
JAMES P. PERRY &
EMILY M. AUSTIN LEAGUE
ABSTRACT NO. 111
COUNTY ROAD 124
COUNTY ROAD 127
COUNTY ROAD 130
LOT 29
LOT 30
LOT 31
LOT 44
LOT 51
LOT 54
LOT 68
LOT 69
LOT 70
MINOR PLAT
BUG BARN
AIRPARK ESTATES
SECTION 5
GRAPHIC SCALE
FINAL PLAT
CLOVER AIRPORT ACRES
A SUBDIVISION OF A 82.198 ACRE TRACT
OF LAND BEING OUT OF
LOTS 30, 44, 47, 48, 49, 50, 65, AND 67,
WEST FRIENDSWOOD SUBDIVISION
(VOL. 1, PG. 86; B.C.M.R.)
IN THE JAMES P. PERRY & EMILY AUSTIN LEAGUE,
ABSTRACT NO. 111,
BRAZORIA COUNTY, TEXAS
1 BLOCK - 2 LOTS
~ OWNERS ~
THE LANDING AT PEARLAND, LTD
a Texas limited partnership
3003 West Parkwood, Suite 100
Friendswood, Texas 77546
CLOVER ACQUISITION CORPORATION
a Texas corporation
185 Hargreaves Drive, Suite C400-588
Austin, Texas 78737
~ SURVEYOR ~
MCKIM & CREED
JOB NO. 1818-S / 28835-0001
MARCH 25, 2022
SHEET 3 OF 5
PZ2-00010

Exhibit B

Drainage Improvements to Serve the Project



PEARLAND REGIONAL AIRPORT
DETENTION POND
PEARLAND, TEXAS

DETENTION POND PLAN AND PROFILE II

KSA

C13.9

FILED and RECORDED

Instrument Number: 2022028783

Filing and Recording Date: 05/11/2022 02:50:53 PM Pages: 19 Recording Fee: $94.00

I hereby certify that this instrument was FILED on the date and time stamped hereon and RECORDED in the OFFICIAL PUBLIC RECORDS of Brazoria County, Texas.

Joyce Hudman, County Clerk
Brazoria County, Texas

ANY PROVISION CONTAINED IN ANY DOCUMENT WHICH RESTRICTS THE SALE, RENTAL, OR USE OF THE REAL PROPERTY DESCRIBED THEREIN BECAUSE OF RACE OR COLOR IS INVALID UNDER FEDERAL LAW AND IS UNENFORCEABLE.

DO NOT DESTROY - Warning, this document is part of the Official Public Record.

cclerk-kali

FAA Docket 16-22-06

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

EXHIBIT G

Statement from Atty Eric Lipper

FAA Docket 16-22-06

SPONSOR'S RESPONSE TO NOTICE OF INVESTIGATION

EXHIBIT G

Statement from Atty Eric Lipper

STATEMENT OF ERIC LIPPER

1. My name is Eric Lipper. I am over twenty-one (21) years of age, of sound mind and fully capable of making this statement.

2. I have the background to make this sort of statement. I am an attorney licensed to practice law in the State of Texas. I have been practicing at this same law firm since 1988 and before that with the Federal Government.

3. My practice is largely in commercial litigation matters and a subset of that deals solely with real estate. I consider myself to be an expert in this area of the law. Various courts have recognized me as an expert.

4. At one time, Clover Acquisition Corporation ("**Clover**") owned the entire tract that is presently at issue. In reviewing the various written materials about this particular real estate no portion of the tract that was later sold to The Landing at Pearland ("**The Landing**") was within federally encumbered property. The Landing is not inside the airport fence.

5. Texas Law controls the property rights here. In Texas, one who owns fee simple title needs no easement across his own property since fee simple title always entitles the owner to use all of the property. *Cecola v. Ruley,* 12 S.W.3d 848, 852 (Tex. App. —Texarkana 2000, no pet.); *see also Howell v. Estes,* 12 S.W. 62 (Tex. 1888). And adjacent property owners whose title derives from the same deed inherit all rights to continue their historic drainage uses.

6. This fact is unchallenged; namely, the property now known as The Landing has always drained into an area at Clover that is approximately mid-field and on the east side of the runway. For years it was a wet drainage area that eventually flows into Cowart Creek but it has now been improved. Despite these improvements there is no change of use.

7. Texas Law tells us that because there was unity of title at one time The Landing automatically received an implied easement and/or an easement by necessity from Clover (the "**Drainage Easement**"). This is very well-settled law in Texas as explained in the paragraph below:

> *[W]here the owner of a single area of land conveys away part of it, the circumstances attending the conveyance may themselves, without aid of language in the deed, and indeed sometimes in spite of such language, cause an easement to arise as between the two parcels thus created—not only in favor of the parcel granted but also in favor of the one remaining in the ownership of the grantor. The basis of the doctrine is that the law reads into the instrument that which the circumstances show both grantor and grantee must have intended, had they given the obvious facts of the transaction proper consideration. And in the case of an implied reservation, it is not necessarily a bar to its creation that the grantor's deed, into*

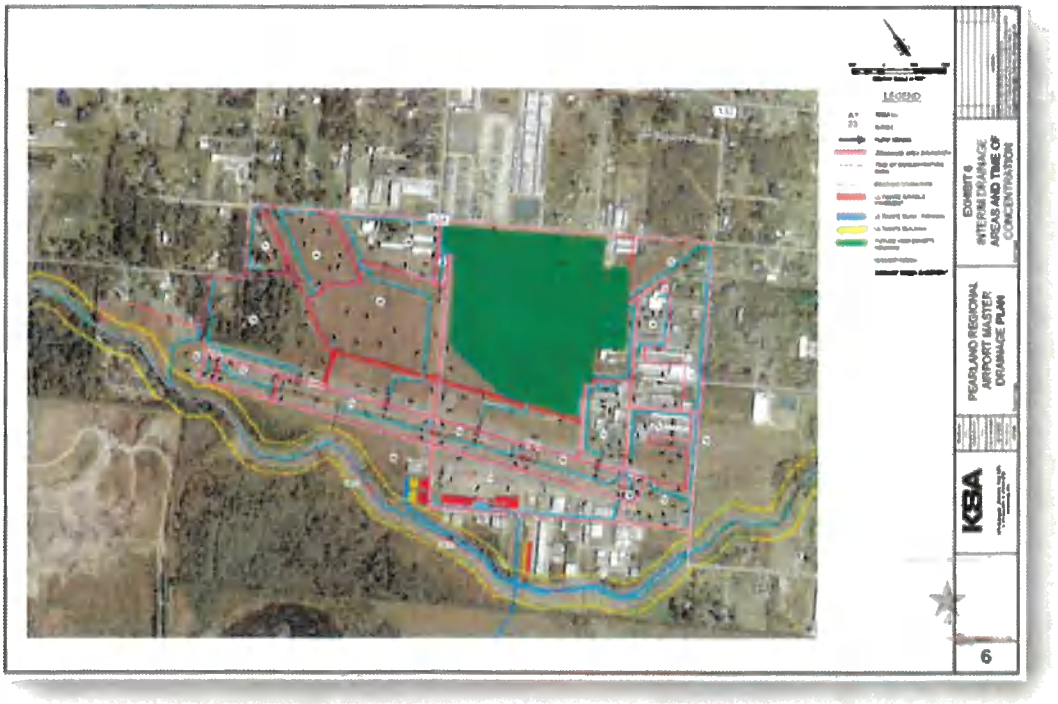
which the law reads it, actually warrants the servient tract thereby conveyed to be free of incumbrance.

See, Mitchell v. Castellaw, 246 S.W.2d 163, 167 (Tex. 1952) (and authority cited therein).

8. A Drainage Easement is a common property right in Texas and any interference with it would be damaging to The Landing. Notably, the Brazoria County Drainage District (the "**Drainage District**") has recognized, and long-ago approved, keeping the historic method of drainage in place as part of its drainage plan. This may be a uniquely Texas system but under the Texas Government Code only the legislatively established Drainage District can approve a drainage plan.

9. With both a common law imposed legal easement, and now supplemented by the Drainage District approval, if Clover impeded The Landing from draining surface waters in this fashion The Landing would be entitled to injunctive relief through a lawsuit to stop that interference. The Landing would also be entitled to sue Clover for damages if they stopped this historic, and Drainage District approved, use. I have handled this sort of litigation as a regular part of my law practice.

10. To make sure this is situation is visually clear the Drainage District approved map includes arrows that indicate water flowing from The Landing to Clover. This is not a change of use as the report from which the image below was taken would confirm:



11. To finalize my legal conclusion on this topic there is a case called *Crooks* that is also worth examining because it explains this sort of drainage proposition in detail. In *Eriksson, Inc. v. Crooks*, 508 S.W.2d 115 (Tex. App. – Waco 1974) the issue was whether or not a drainage easement existed in favor of the buyer across the seller's property after the closing. The seller said that there was no easement. Of note, in *Crooks*, there was no recorded drainage easement and that is the same situation for Clover here. To explain why that sort of recording was unnecessary *Crooks* says:

> *"Where an owner of an entire tract of land or of two or more adjoining parcels employs a part thereof so that one derives from the other a benefit or advantage of a continuous, permanent, and apparent nature, and sells the one in favor of which such quasi easement exists, such easement, being necessary to the reasonable enjoyment of the property granted, will pass to the grantee by implication."*

12. With all of these facts and cases here are my conclusions: (a) the continuing use of property that has always historically been used for drainage purposes is not a change of use under Texas Law; (b) there is no requirement that a drainage easement be recorded; and (c) the Drainage District has formalized this drainage easement with its approval. No citizen of the State of Texas can override the Drainage District's approval.

Eric Lipper
1415 Louisiana Street, 36th Floor
Houston, Texas 77002-2728

Walenga, Pat (FAA)

From: Christopher Poreda <cp@lopal.com>
Sent: Monday, March 6, 2023 3:32 PM
To: 9-AWA-AGC-Part-16 (FAA); Stephen Alexander; Willis, Kevin (FAA)
Subject: Response of Clover Acquisition Corporation to FAA's Notice of Investigation
Attachments: Response to NOI w Ex C E F G.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Attached please find Clover Acquisition Corp.'s response to the FAA's Notice of Investigation. Exhibits A, B, and D of the response are being served by overnight delivery because of their large electronic file size.

Christopher Poreda, Of Counsel
cp@lopal.com

Law Offices of Paul A. Lange, LLC www.lopal.com
Practicing in CT, NY & MA; nationwide in aviation regulatory and transactional matters

Law Offices of
PAUL A. LANGE LLC

CT office: 80 Ferry Blvd., Stratford, CT 06615-6079 | 203.375.7724 x100 | 203.375.9397 (F)
NY office: 445 Park Ave., 9th Fl., New York, NY 10022-8632 | 212.385.1215 | 212.608.1215 (F)