TCEQ EXCEPTION REQUEST APPLICATION

For

Woodfield Preserve
Sidewalk Exception in Phase 7

Prepared for:

LSMA Georgetown, LLC.
ATTN: Larry Colditz
6310 Capital Dr.
Ste 130
Lakewood Ranch, FL
Phone: (303)-720-4436

Prepared by:

LJA ENGINEERING, INC.
2700 La Frontera Blvd
Ste. 200
Round Rock, Texas 78681
TBPE# 1386
Phone: (512) 439-4700

October 2024

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Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with 30 TAC 213.

Administrative Review

1. Edwards Aquifer applications must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.

   To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: http://www.tceq.texas.gov/field/eapp.

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.

3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.

4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

   An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.

6. If the geologic assessment was completed before October 1, 2004 and the site contains "possibly sensitive" features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.

2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.

4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a "Mid-Review Modification". Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is denied/withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the affected jurisdictions.

Please contact the regional office if you have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ's Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ's San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

1. Regulated Entity Name: Woodfield Preserve Sidewalk Exception in Phase 7						**2. Regulated Entity No.:**			
3. Customer Name: Larry Colditz, LSMA Georgetown LLC						**4. Customer No.: CN606070779**			
5. Project Type: (Please circle/check one)	New		Modification			Extension	Exception		
6. Plan Type: (Please circle/check one)	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential		Non-residential			**8. Site (acres):**		<1 Acre	
9. Application Fee:	$500.00		**10. Permanent BMP(s):**			NA			
11. SCS (Linear Ft.):	NA		**12. AST/UST (No. Tanks):**			NA			
13. County:	Williamson		**14. Watershed:**			Berry Creek			

Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the "Texas Groundwater Conservation Districts within the EAPP Boundaries" map found at:

http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf

For more detailed boundaries, please contact the conservation district directly.

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	___	___	X
Region (1 req.)	___	___	X
County(ies)	___	___	X
Groundwater Conservation District(s)	___Edwards Aquifer Authority ___Barton Springs/ Edwards Aquifer ___Hays Trinity ___Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	___Austin ___Buda ___Dripping Springs ___Kyle ___Mountain City ___San Marcos ___Wimberley ___Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	___Austin ___Cedar Park ___Florence _X Georgetown ___Jerrell ___Leander ___Liberty Hill ___Pflugerville ___Round Rock

San Antonio Region					
County:	**Bexar**	**Comal**	**Kinney**	**Medina**	**Uvalde**
Original (1 req.)	___	___	___	___	___
Region (1 req.)	___	___	___	___	___
County(ies)	___	___	___	___	___
Groundwater Conservation District(s)	___ Edwards Aquifer Authority ___Trinity-Glen Rose	___Edwards Aquifer Authority	___Kinney	___EAA ___Medina	___EAA ___Uvalde
City(ies) Jurisdiction	___Castle Hills ___Fair Oaks Ranch ___Helotes ___Hill Country Village ___Hollywood Park ___San Antonio (SAWS) ___Shavano Park	___Bulverde ___Fair Oaks Ranch ___Garden Ridge ___New Braunfels ___Schertz	NA	___San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.

Justin Midura, P.E.

Justin D. Midura

Print Name of Customer/Authorized Agent

Justin D. Midura 10-2-2024

Signature of Customer/Authorized Agent Date

FOR TCEQ INTERNAL USE ONLY				
Date(s)Reviewed:		Date Administratively Complete:		
Received From:		Correct Number of Copies:		
Received By:		Distribution Date:		
EAPP File Number:		Complex:		
Admin. Review(s) (No.):		No. AR Rounds:		
Delinquent Fees (Y/N):		Review Time Spent:		
Lat./Long. Verified:		SOS Customer Verification:		
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):	
Core Data Form Complete (Y/N):			Signed (Y/N):	
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):	

General Information Form

Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge and Transition Zones and Relating to 30 TAC §213.4(b) & §213.5(b)(2)(A), (B) Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

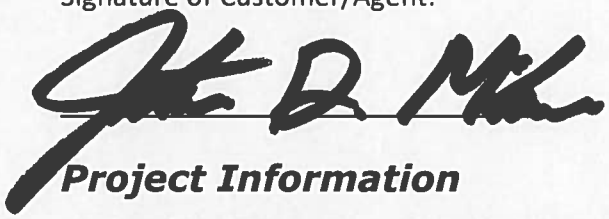
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **General Information Form** is hereby submitted for TCEQ review. The application was prepared by:

Print Name of Customer/Agent: Justin Midura, P.E.

Date: 10-2-2024

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Woodfield Preserve Sidewalk Exception in Phase 7
2. County: Williamson
3. Stream Basin: Berry Creek
4. Groundwater Conservation District (If applicable): _____
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

   ☐ WPAP
   ☐ SCS
   ☐ Modification
   ☐ AST
   ☐ UST
   ☒ Exception Request

7. Customer (Applicant):

   Contact Person: Larry Colditz
   Entity: LSMA Georgetown, LLC
   Mailing Address: 6310 Capital Dr, Ste 130
   City, State: Lakewood Ranch, FL Zip: 34202
   Telephone: 303-720-4436 FAX: _____
   Email Address: LColditz@starwoodland.com

8. Agent/Representative (If any):

   Contact Person: Justin Midura, P.E.
   Entity: LJA Engineering, Inc.
   Mailing Address: 2700 La Frontera Blvd, Ste 200
   City, State: Round Rock, TX Zip: 78681
   Telephone: 512-439-4700 FAX: _____
   Email Address: Jmidura@lja.com

9. Project Location:

   ☒ The project site is located inside the city limits of Georgetown.
   ☐ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____.
   ☐ The project site is not located within any city's limits or ETJ.

10. ☒ The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

    From Austin, TX, Travel North on I35. Take Exit 266 toward TX-195 N/Florence/Killeen. Turn Left onto TX-195 W. In two miles, turn left at Shell Rd. In about two miles site will be on the left, South of Shell Rd.

11. ☒ **Attachment A – Road Map**. A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.

12. ☒ **Attachment B - USGS / Edwards Recharge Zone Map**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached. The map(s) clearly show:

    ☒ Project site boundaries.
    ☒ USGS Quadrangle Name(s).
    ☒ Boundaries of the Recharge Zone (and Transition Zone, if applicable).
    ☒ Drainage path from the project site to the boundary of the Recharge Zone.

13. ☒ **The TCEQ must be able to inspect the project site or the application will be returned**. Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☒ Survey staking will be completed by this date: October 2024

14. ☒ **Attachment C – Project Description**. Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:

    ☒ Area of the site
    ☒ Offsite areas
    ☒ Impervious cover
    ☒ Permanent BMP(s)
    ☒ Proposed site use
    ☒ Site history
    ☒ Previous development
    ☒ Area(s) to be demolished

15. Existing project site conditions are noted below:

    ☐ Existing commercial site
    ☐ Existing industrial site
    ☐ Existing residential site
    ☐ Existing paved and/or unpaved roads
    ☐ Undeveloped (Cleared)
    ☒ Undeveloped (Undisturbed/Uncleared)
    ☐ Other: _____

Prohibited Activities

16. ☒ I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:

    (1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);

    (2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;

    (3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;

    (4) The use of sewage holding tanks as parts of organized collection systems; and

    (5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

    (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17. ☒ I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

    (1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);

(2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and

(3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

Administrative Information

18. The fee for the plan(s) is based on:

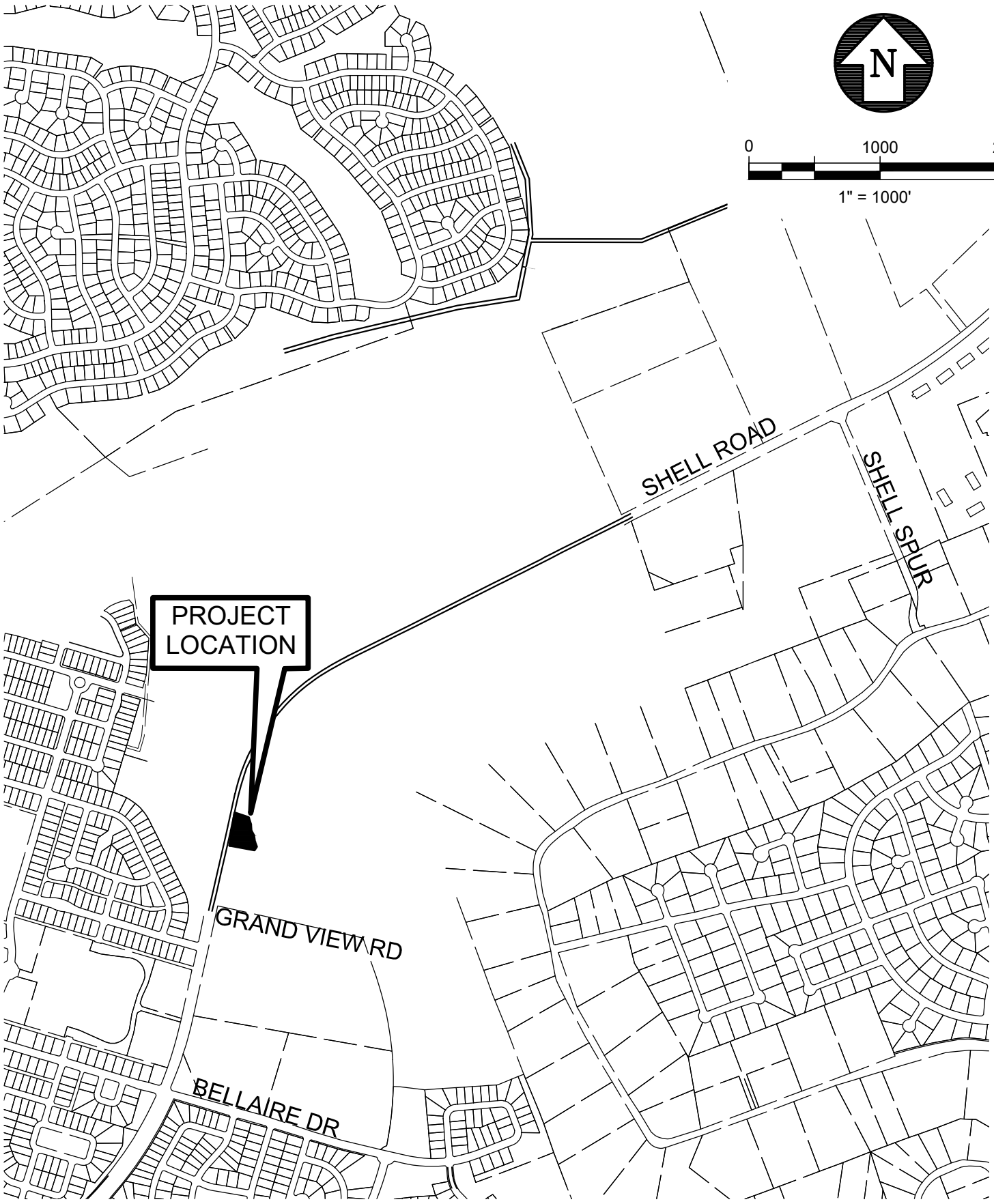
- ☐ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
- ☐ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
- ☐ For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
- ☒ A request for an exception to any substantive portion of the regulations related to the protection of water quality.
- ☐ A request for an extension to a previously approved plan.

19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

- ☐ TCEQ cashier
- ☒ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
- ☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

20. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

21. ☒ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.



LJA Engineering, Inc.

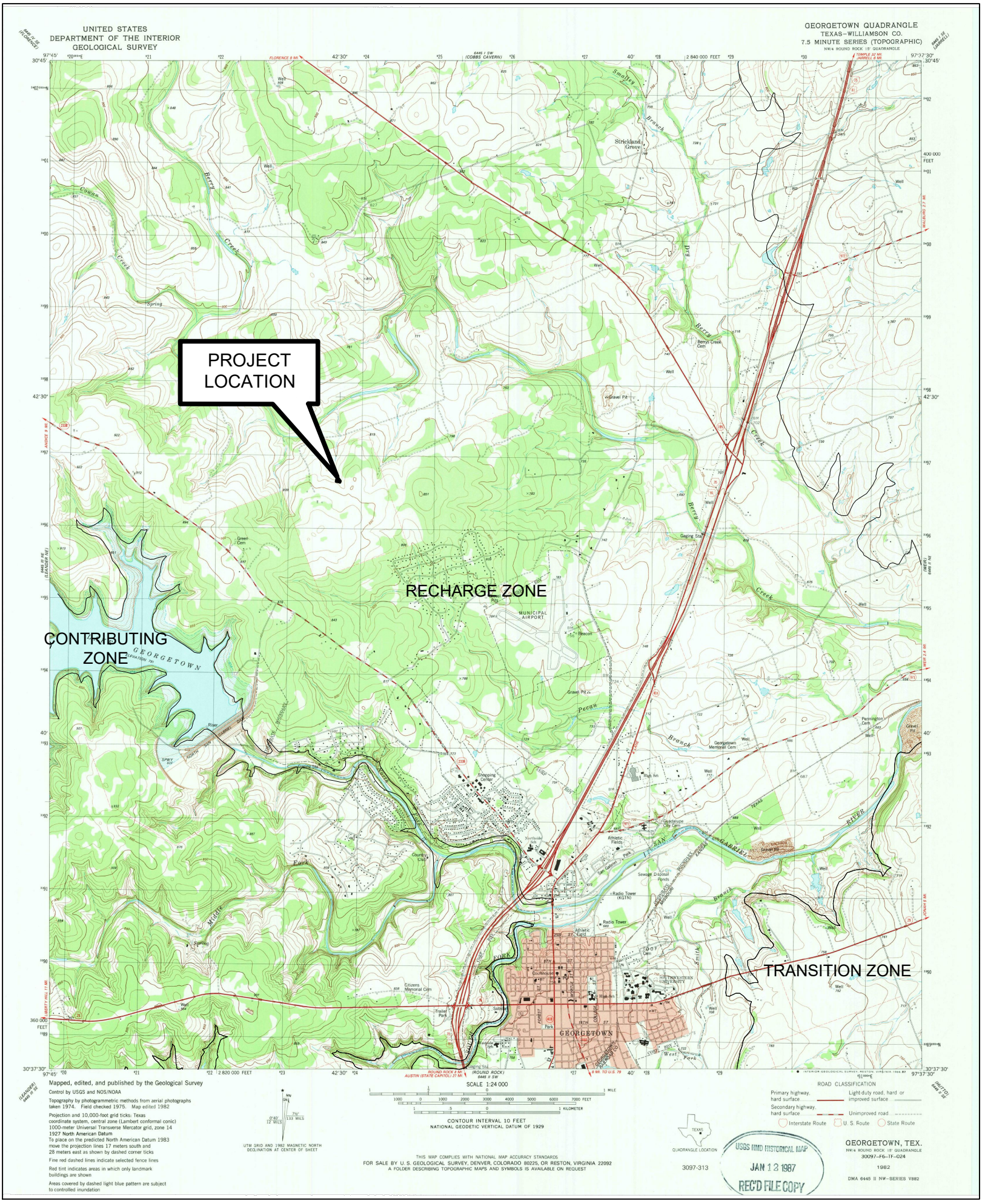
2700 La Frontera Blvd.
Suite 150
Round Rock, Texas 78681

Phone 512.439.4700
Fax 512.439.4716
FRN-F-1386

WOODFEILD PRESERVE SIDEWALK
EXCEPTION - GEORGETOWN, TX
ATTACHMENT A - ROAD MAP

Date\Time : Tue, 01 Oct 2024 - 11:48am User Name : jmidura
Path\Name : G:\A245-1002 Georgetown Village\PERMITTING\TCEQ\Phase 1 & Phase 7\Sidewalk Exception\02-general\ACAD\02a_Road Map.dwg

Attachment B - USGS / Edwards Recharge Zone Map



General Information Form

ATTACHMENT C

TCEQ SCS APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

PROJECT DESCRIPTION:

The Woodfield Preserve sidewalk exception in Phase 7 is located South of Shell Road between SH 195 and FM 2338 in Georgetown, TX, Williamson County. The entirety of The Woodfield Preserve development consists of approximately 293.6 acres and proposes a combination of single-family residential lots, a multi-family condominium site plan, commercial development, parkland, amenity-centers, and all related infrastructure divided amongst seven (7) phases. The proposed development is located within the City of Georgetown city limits and subject to the Shell Road Planned Unit Development (PUD), approved Ordinance No. 2019-32. Under existing conditions, the tract is vacant and undeveloped. The site consists of assorted grasses and multiple protected trees, with terrain sloped at approximately 1% to 10%.

The Woodfield Preserve Phase 7 project has a sidewalk/trail alignment that's adjacent to a known TCEQ karst feature (referred to as feature "F-13" in the geologic assessment). The main issue is this sidewalk stops on either side of the karst buffer and the Developer is asking if a connection can be made through the karst buffer to connect the sidewalk. Based on my understanding, per RG 348 Management of Sensitive Features Ch 5; pg 5-3, a trail/sidewalk is allowed as long as it stays 50' from the feature. The Developer is proposing the sidewalk connection go through the karst buffer, but stay 50' away from the feature. This proposed solution has already been presented and informally approved by TCEQ staff via email. As requested, the sidewalk will be concrete. Please see attached email correspondence with TCEQ discussing this proposed exception and confirming approval of the proposed solution.

The impervious cover from the proposed sidewalk is already accounted for in the approved Woodfield Preserve Phase 1 & 7 WPAP & SCS Edwards Aquifer Protection Program (EAPP) ID Nos. 11003313 (WPAP) and 11003314 (SCS).

Justin Midura

From: James Slone <james.slone@tceq.texas.gov>
Sent: Thursday, August 29, 2024 3:59 PM
To: Justin Midura
Cc: Chris
Subject: RE: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

https://www.tceq.texas.gov/permitting/eapp/material.html

It's subtle… **TCEQ-0628 Recharge and Transition Zone Exception Request Form**
About halfway down the page.

From: Justin Midura <jmidura@lja.com>
Sent: Thursday, August 29, 2024 3:12 PM
To: James Slone <james.slone@tceq.texas.gov>
Cc: Chris <chris@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

Bo,

Sounds good, the Developer would prefer concrete sidewalk as well so we're in agreement there.

Would you be so kind as to send me the website link / application for the Exception plan please? I'm looking online and not seeing it.

Thank you good sir,

Justin Midura, P.E.
Project Manager

LJA Engineering | Employee-Owned. Client Focused.
Central Texas Land Development
Office: 512-439-4700
Direct: 512-767-7352
Mobile: 512-788-1685
LJA.com
Facebook • Twitter • LinkedIn

From: James Slone <james.slone@tceq.texas.gov>
Sent: Thursday, August 29, 2024 3:03 PM
To: Justin Midura <jmidura@lja.com>
Cc: Chris <chris@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

Justin,
The way you have drawn (50 ft upgradient setback) it will work for us. You will need to submit an Exception plan for approval since it is an established buffer. We would prefer the sidewalk to remain concrete instead of decomposed granite since there is a better chance of the granite washing into the feature. Please let me know if you have questions.
Bo

James “Bo” Slone, P.G.
Team Leader
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality
(512) 239-6994

From: Justin Midura <jmidura@lja.com>
Sent: Thursday, August 29, 2024 1:32 PM
To: James Slone <james.slone@tceq.texas.gov>
Cc: Chris <chris@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

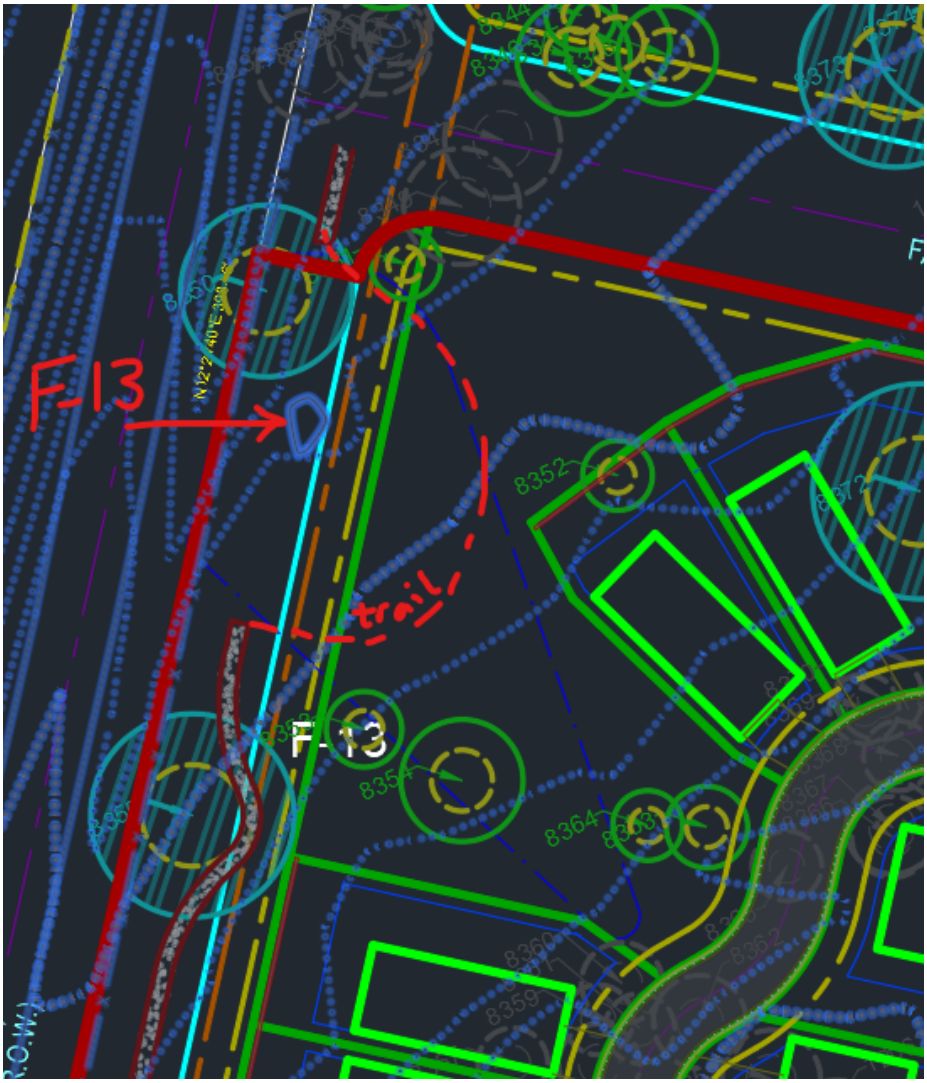
Hey Bo,

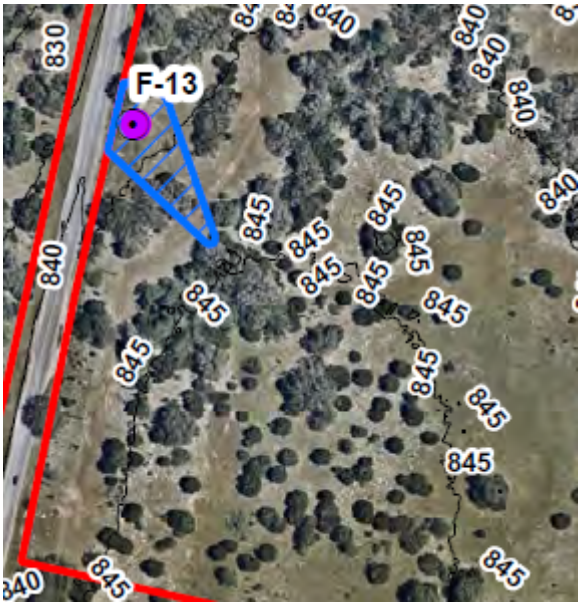
I think the trail could wrap around the feature and stay 50 ft away. The below screen shot shows the “F-13” feature and the proposed trail alignment through the buffer. Looks like cutting straight through would put the trail right on top of the feature.

Confirmed that drainage flows towards Shell Road (there’s an existing borrow ditch along the road).

Please see below excerpt from Horizon’s GA on how they classified F-13 feature:

> Geologic Feature F-13: Upland sinkhole measuring approximately 20 feet long x 6 feet wide x 2 feet deep, with 2 small (<2 inches) semi-open drainage portals about 12 feet apart among loose to firm clayey soil infilling. This feature appears to be partially filled with small rock and/or soil debris. Slight air flow conductivity was noted at the portal openings. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles about 3 feet below the surface. Somewhere between June to August of 2017, Cambrian mechanically excavated the feature using a backhoe (16.5 feet long x 4 to 11 feet wide x 7.5 feet deep) and deemed this feature to be a cave filled with soil. However, Horizon investigated the feature further and determined the feature is an upland sinkhole that lacks sufficient human- navigable passage to be considered a cave by TSS standards. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.





Justin Midura, P.E.
Project Manager

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Central Texas Land Development
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Direct: 512-767-7352
Mobile: 512-788-1685
LJA.com
Facebook • Twitter • LinkedIn

From: James Slone <james.slone@tceq.texas.gov>
Sent: Thursday, August 29, 2024 1:12 PM
To: Justin Midura <jmidura@lja.com>
Cc: Chris <chris@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

Hey Justin,
I have a couple of questions:
What's the maximum distance you can be away from the feature?
What type of feature is it (cave, solution cavity, etc)?
Can you confirm the drainage flows toward Shell Road?
Thanks,
Bo

James "Bo" Slone, P.G.
Team Leader
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality
(512) 239-6994

From: Justin Midura <jmidura@lja.com>
Sent: Wednesday, August 28, 2024 2:55 PM
To: James Slone <james.slone@tceq.texas.gov>
Cc: Chris <chris@waterloodevelopment.com>
Subject: FW: Sidewalk gap along Shell Road - Karst area

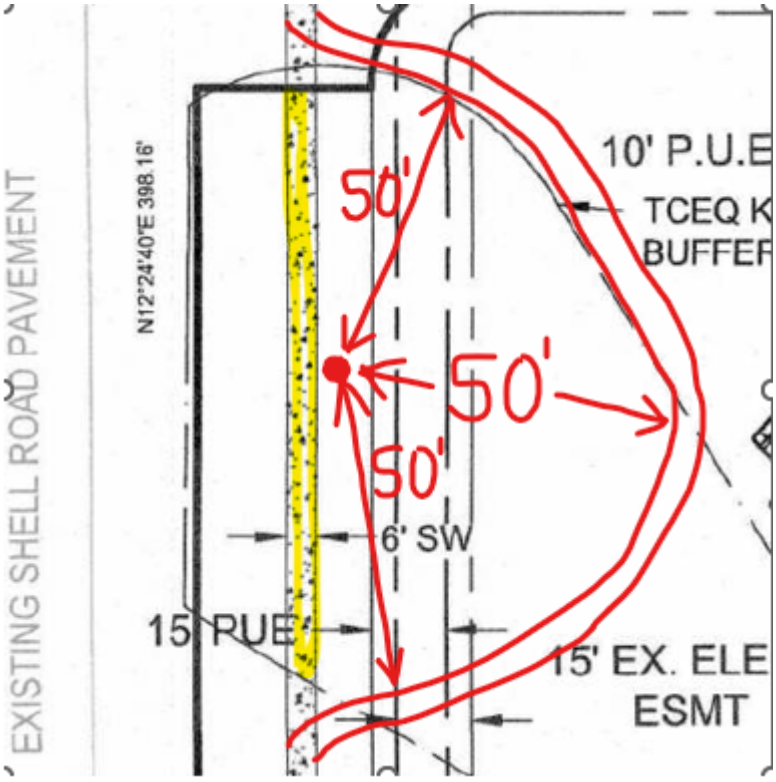
Good afternoon Bo,

Hope you've been well since we last spoke.

I'm reaching out regarding the Woodfield Preserve project and a sidewalk/trail alignment that's adjacent to a known TCEQ karst feature. The main issue is this sidewalk stops on either side of the karst buffer and the Developer is asking if a connection can be made through the buffer to connect the sidewalk (screen shot below on left is what's currently built where the sidewalk stops outside the buffer, which is shown in blue). Please see below email correspondence for reference. Based on the below screenshots, the yellow highlighted portion going straight through the buffer is what was originally desired before Horizon found and mapped the karst buffer.

Based on my understanding, per RG 348 Management of Sensitive Features Ch 5; pg 5-3, a trail/sidewalk is allowed as long as it stays 50' from the feature.

The Developer would like to install a hand dug decomposed granite trail connection going through the buffer. Would the 50’ offset be required, or could the trail go straight through the buffer like originally desired?



Justin Midura, P.E.
Project Manager

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Office: 512-439-4700
Direct: 512-767-7352
Mobile: 512-788-1685
LJA.com
Facebook • Twitter • LinkedIn

From: Suzanne <suzanne@waterloodevelopment.com>
Sent: Tuesday, August 27, 2024 10:34 PM
To: Justin Midura <jmidura@lja.com>
Cc: Chris <chris@waterloodevelopment.com>; Alex <alex@waterloodevelopment.com>
Subject: FW: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

Hi Justin,

This sidewalk connection at Phase 7 has come up again. Is there someone you could reach out to at TCEQ to see if a hand dug DG path to connect the sidewalk would be acceptable?

Thank you,
Suzanne Blackburn

WATERLOO DEVELOPMENT INC.
P.O. BOX 27335
Austin, Texas 78755
Office: (512) 346-3482
Cell: (512) 415-9574

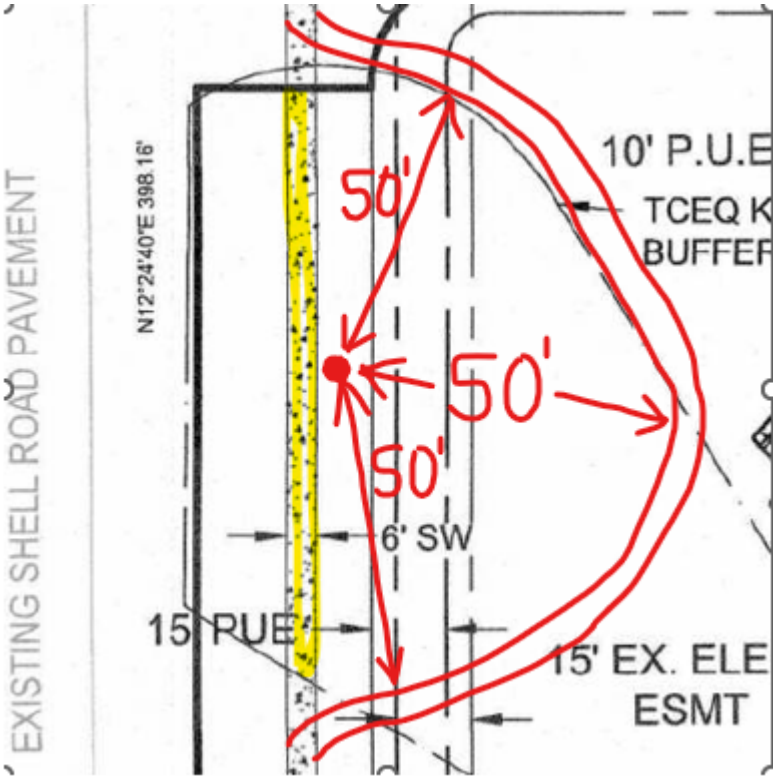
From: Mia Serrato <mia.serrato@lennar.com>
Sent: Tuesday, August 27, 2024 11:41 AM
To: Suzanne <suzanne@waterloodevelopment.com>
Cc: Alex <alex@waterloodevelopment.com>
Subject: Fwd: Sidewalk gap along Shell Road - Karst area

Mia Serrato
Land Development Manager
Mia.Serrato@Lennar.com
Mobile 737-325-7997

From: Justin Midura <jmidura@lja.com>
Sent: Friday, June 21, 2024 11:07:33 AM
To: Chris <chris@waterloodevelopment.com>; Mia Serrato <mia.serrato@lennar.com>; Bill Barton <bill.barton@lennar.com>
Cc: Suzanne <suzanne@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

Chris,

I spoke with Jim just now to confirm and this is really the only option available if trying to do a trail (would still need to confirm with TCEQ and get their permission first):



We would need to find the opening, but it's easy to spot now (the trail would need to be min 50' away from the opening):

Photo 51. Feature F-13 prior to Cambrian excavation.

Photo 52. Feature F-13 during Cambrian hand excavation.

Photo 53. Feature F-13 after Cambrian backhoe excavation.

Photo 54. Interior of Feature F-13 after Cambrian backhoe and hand excavation.

Justin Midura, P.E.
Project Manager

LJA Engineering | Employee-Owned. Client Focused.
Central Texas Land Development
Office: 512-439-4700
Direct: 512-767-7352
Mobile: 512-788-1685
LJA.com
Facebook • Twitter • LinkedIn

From: Chris <chris@waterloodevelopment.com>
Sent: Friday, June 21, 2024 9:55 AM
To: Mia Serrato <mia.serrato@lennar.com>; Justin Midura <jmidura@lja.com>; Bill Barton <bill.barton@lennar.com>
Cc: Suzanne <suzanne@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

Justin – Can we work a trail in and stay 50' from the feature?

Mia – I don't recall a CO deduct on this yet. We were trying to figure out what options we had to make a connection. Now that we have confirmation that we can't do concrete, I'll get a CO deduct from them. I would recommend we have DigDug or Perfect Cuts do this work. We can get pricing from them once Justin confirms if we have the room.

Thank you.

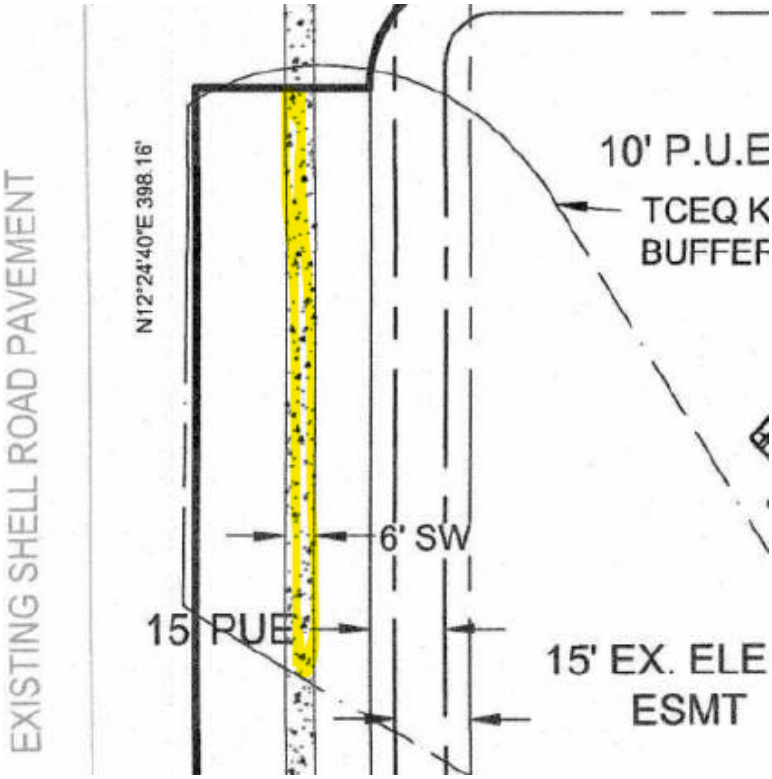
Chris Blackburn
WATERLOO DEVELOPMENT INC.

P.O. Box 27335
Austin, Texas 78755
Phone: 512-346-3482, ext. 101
Cell: 512-413-2892

From: Mia Serrato <mia.serrato@lennar.com>
Sent: Friday, June 21, 2024 9:45 AM
To: Chris <chris@waterloodevelopment.com>; Justin Midura <jmidura@lja.com>; Bill Barton <bill.barton@lennar.com>
Cc: Suzanne <suzanne@waterloodevelopment.com>
Subject: Re: Sidewalk gap along Shell Road - Karst area

Hi Chris,

I would like to look into doing a decomposed granite trail. Is JL Gray going to be completing the work? Did we get a deductive CO For the sidewalk not installed? Michael Coleman did let me know that we would need to bring granite in by the wheelbarrow and only disturb the area where the trail is going, so no equipment in the area.



Thanks,

Mia Serrato
Land Development Manager

LENNAR

Mia.Serrato@Lennar.com
Mobile 737-325-7997

From: Chris <chris@waterloodevelopment.com>
Sent: Thursday, June 20, 2024 5:49 PM
To: Justin Midura <jmidura@lja.com>; Mia Serrato <mia.serrato@lennar.com>; Bill Barton <bill.barton@lennar.com>
Cc: Suzanne <suzanne@waterloodevelopment.com>
Subject: Sidewalk gap along Shell Road - Karst area

All –

I reached out to Horizon about the sidewalk gap along Shell Road at Phase 7 due to the karst feature. Per below, we can't do any concrete, but we could do a trail (mulch, granite) to connect as long as it is 50' from the feature. Is this something we want to look at doing?

Thank you.

Chris Blackburn
WATERLOO DEVELOPMENT INC.

P.O. Box 27335
Austin, Texas 78755
Phone: 512-346-3482, ext. 101
Cell: 512-413-2892

From: James Killian <jkillian@horizon-esi.com>
Sent: Thursday, June 20, 2024 3:04 PM
To: Chris <chris@waterloodevelopment.com>; Scott Flesher <sflesher@horizon-esi.com>; Greg Sherrod <gsherrod@horizon-esi.com>
Subject: RE: Karst buffer question

No concrete since this would be considered construction and probably block runoff into the feature.

James Killian, PG
Senior Geologist
Horizon Environmental Services
C: 512.934.0358 | TBPG Firm No. 50679

From: Chris <chris@waterloodevelopment.com>
Sent: Thursday, June 20, 2024 3:02 PM
To: James Killian <jkillian@horizon-esi.com>; Scott Flesher <sflesher@horizon-esi.com>; Greg Sherrod <gsherrod@horizon-esi.com>
Subject: Re: Karst buffer question

[EXTERNAL EMAIL]

Can a hiking trail be concrete, or are we talking mulch or crushed granite?

Chris Blackburn
Waterloo Development, Inc.
Sent from my Samsung

From: James Killian <jkillian@horizon-esi.com>
Sent: Thursday, June 20, 2024 2:52:01 PM
To: Scott Flesher <sflesher@horizon-esi.com>; Chris <chris@waterloodevelopment.com>; Greg Sherrod <gsherrod@horizon-esi.com>
Subject: RE: Karst buffer question

From RG 348 Management of Sensitive Features Ch 5; pg 5-3:

It is recommended that the buffers around a point recharge feature or cluster of contiguous point recharge features be maintained in a natural state to the maximum practical extent. This implies a construction-free zone. Activities and structures allowed within buffer zones are limited. Hiking trails may be located in buffer zones as long as they are at least 50 feet from the feature. When all or a portion of the buffer for a sensitive feature is located within the yard of a residential tract, it should be separated by a barrier, such as a fence, from conventional landscaping and maintained in the natural state. The "natural state" of a buffer will typically be a combination of dense native grasses and forbs in a mosaic of shrubs and trees.

James Killian, PG
Senior Geologist
Horizon Environmental Services
C: 512.934.0358 | TBPG Firm No. 50679

From: Scott Flesher <sflesher@horizon-esi.com>
Sent: Thursday, June 20, 2024 2:44 PM
To: Chris <chris@waterloodevelopment.com>; Greg Sherrod <gsherrod@horizon-esi.com>; James Killian <jkillian@horizon-esi.com>
Subject: RE: Karst buffer question

Chris,

It is my understanding that no disturbance or vegetation clearing is allowed within a karst setback. This is also a case by case basis.

We could propose the sidewalk to TCEQ, try and pick an alignment that is already void of vegetation, and propose to plant a vegetation (grasses and forbs) strip between the sidewalk and karst feature.

Jim, any thoughts?

Thank you,

Scott Flesher
Vice President I Ecological Program Manager
Horizon Environmental Services
C: 512.695.4060 | TBPG Firm No. 50679

From: Chris <chris@waterloodevelopment.com>
Sent: Thursday, June 20, 2024 1:59 PM
To: Scott Flesher <sflesher@horizon-esi.com>; Greg Sherrod <gsherrod@horizon-esi.com>
Subject: Karst buffer question

[EXTERNAL EMAIL]

Scott/Greg –

Good afternoon. Question for you regarding karst buffer zones as it relates to the Woodfield project. We have one along Shell Road that has sidewalk ending on either side of the buffer. Understanding excavation, etc. can't be done, is it at all possible to build a "floating" sidewalk in a buffer area? Or is impervious cover also a no go?

Thank you.

Chris Blackburn
WATERLOO DEVELOPMENT INC.

P.O. Box 27335
Austin, Texas 78755
Phone: 512-346-3482, ext. 101
Cell: 512-413-2892

[EXTERNAL EMAIL] Exercise caution. Do not open attachments or click links from unknown senders or unexpected email

[EXTERNAL EMAIL] Exercise caution. Do not open attachments or click links from unknown senders or unexpected email

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Horizon™
Environmental Services, Inc.

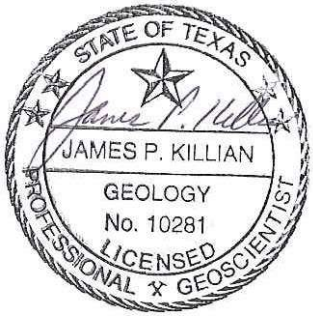
GEOLOGIC ASSESSMENT
APPROXIMATELY 308-ACRE GEORGETOWN VILLAGE TRACT
SHELL ROAD
GEORGETOWN, WILLIAMSON COUNTY, TEXAS
HJN 21081.001 GA

PREPARED FOR:

LENNAR HOMES AND CONSTRUCTION LTD
AUSTIN, TEXAS

PREPARED BY:

HORIZON ENVIRONMENTAL SERVICES, INC.
TBPG FIRM REGISTRATION NO. 50488



JUNE 2021

CORPORATE HEADQUARTERS
1507 South IH 35 ★ Austin, Texas 78741 ★ 512.328.2430 ★ Fax 512.328.1804 ★ www.horizon-esi.com
An LJA Company

Horizon
Environmental Services, Inc.

TABLE OF CONTENTS

Geologic Assessment

Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

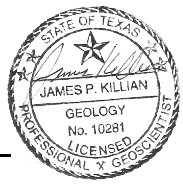
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: James Killian Telephone: 512 328-2430

Date: 1 June 2021 Fax: 512 328-1804

Representing: Horizon Environmental Services, Inc. and TBPG Firm Registration No. 50488
(Name of Company and TBPG or TBPE registration number)

Signature of Geologist:



Regulated Entity Name: 308-acre Georgetown Village Tract, Georgetown, Williamson County, Texas

Project Information

1. Date(s) Geologic Assessment was performed: 5 to 8 April 2021 and 12, 17 to 20 May 2021
2. Type of Project:
   - ☒ WPAP
   - ☒ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone
   - ☐ Contributing Zone within the Transition Zone

4. ☒ **Attachment A - Geologic Assessment Table**. Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.

5. ☒ Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
Doss silty clay, 1-5% slopes (DoC)	C	1 to 2
Eckrant extremely stony clay, 0-3% slopes (EeB)	D	0.5 to 1
Eckrant-Rock outcrop association, 1-10% slopes (ErE)	D	0.5 to 1
Georgetown silty clay loam, 1-3% slopes (GsB)	D	2 to 4

** Soil Group Definitions (Abbreviated)*

A. *Soils having a high infiltration rate when thoroughly wetted.*
B. *Soils having a moderate infiltration rate when thoroughly wetted.*
C. *Soils having a slow infiltration rate when thoroughly wetted.*
D. *Soils having a very slow infiltration rate when thoroughly wetted.*

6. ☒ **Attachment B – Stratigraphic Column**. A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.

7. ☒ **Attachment C – Site Geology**. A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.

8. ☒ **Attachment D – Site Geologic Map(s)**. The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'

   Applicant's Site Plan Scale: 1" = 400'
   Site Geologic Map Scale: 1" = 400'
   Site Soils Map Scale (if more than 1 soil type): 1" = 800'

9. Method of collecting positional data:

   ☒ Global Positioning System (GPS) technology.
   ☐ Other method(s). Please describe method of data collection: _____

10. ☒ The project site and boundaries are clearly shown and labeled on the Site Geologic Map.

11. ☒ Surface geologic units are shown and labeled on the Site Geologic Map.

12. ☒ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.

    ☐ Geologic or manmade features were not discovered on the project site during the field investigation.

13. ☒ The Recharge Zone boundary is shown and labeled, if appropriate.

14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.

    ☒ There are 1 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    ☐ The wells are not in use and have been properly abandoned.
    ☒ The wells are not in use and will be properly abandoned.
    ☐ The wells are in use and comply with 16 TAC Chapter 76.
    ☐ There are no wells or test holes of any kind known to exist on the project site.

Administrative Information

15. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

Horizon
Environmental Services, Inc.

ATTACHMENT A

GEOLOGIC ASSESSMENT TABLE

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: 308-acre Georgetown Village tract, Georgetown, Williamson County, Texas

LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
F-1	30.70239	-97.70701	C/SH	30	Ked	20	20	1.5	--	0	--	--	C,F,O	50	80		x	x		Hillside
F-1.5	30.70223	-97.70707	SH/SC	20	Ked	11	7	3	--	0	--	--	C,F,O	25	45		x	x		Hillside
F-2	30.70325	-97.7058	C/SH	30	Ked	10	10	1	--	0	--	--	C,F,O	40	70		x	x		Hillside
F-3	30.70618	-97.69933	SH	20	Ked	10	10	1	--	0	--	--	C,F,O	15	35	x		x		Hillside
F-3.5	30.70612	-97.69896	SH	20	Ked	18	6.5	4	--	0	--	--	C,F,O	10	30	x		x		Hillside
F-4	30.7075	-97.70002	SC/SF	20	Ked	3	2	4.5	N280W	0	--	--	C,F,O	30	50		x	x		Hillside
F-5	30.70689	-97.70037	C/SH	30	Ked	20	15	3	--	0	--	--	C,F,O	55	85		x		x	Streambed
F-6	30.70764	-97.703	C/SH	30	Ked	35	30	5	--	0	--	--	C,F,O	45	75		x	x		Hillside
F-6.5	30.7076	-97.70324	SC	20	Ked	1.5	0.6	1	--	0	--	--	C,F,O	10	30	x		x		Hillside
F-7	30.7069	-97.70314	SH	20	Ked	7	7	1	--	0	--	--	C,F,O	35	55		x	x		Hillside
F-8	30.70199	-97.7014	SH	20	Ked	12	10	2.5	--	0	--	--	C,F,O	35	55		x	x		Hillside
F-9	30.70213	-97.70326	C/SH	30	Ked	20	15	2.5	--	0	--	--	C,F,O	40	70		x	x		Hillside
F-10	30.69908	-97.70325	C/SH	30	Ked	35	25	7.5	--	0	--	--	C,F,O	45	75		x	x		Hillside
F-11	30.69673	-97.7043	SH	20	Kgt	20	20	1.5	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-12	30.70055	-97.7016	SH	20	Ked	8	8	1.5	--	0	--	--	C,F,O	30	50		x	x		Hillside
F-12A	30.70065	-97.70164	SC	20	Ked	1	0.5	1	--	0	--	--	C,F,O	25	45		x	x		Hillside
F-13	30.69927	-97.70726	SH	20	Ked	20	6	2	--	0	--	--	C,F,O	35	55		x	x		Hillside
F-14	30.69991	-97.70406	SF	20	Ked	3	0.5	1.5	N295W	0	--	--	C,F,O	15	35	x		x		Hillside
F-15	30.70863	-97.70583	SH	20	Ked	7	5	1.5	--	0	--	--	C,F,O	35	55		x	x		Hillside
F-16	30.70111	-97.70495	SC	20	Ked	3	2	1.5	--	0	--	--	C,F,O	15	35	x		x		Hillside
F-17	30.70078	-97.70264	C/SC	30	Ked	5	3	3	--	0	--	--	C,F,O	45	75		x	x		Hillside
F-18	30.70118	-97.69934	SH/SC	20	Ked	5	5	1	--	0	--	--	C,F,O	25	45		x	x		Hillside
F-19	30.7028	-97.69688	C/SH	30	Ked	30	25	3	--	0	--	--	C,F,O	45	75		x	x		Hillside
F-20	30.70318	-97.69697	SH/SC	20	Ked	20	20	3	--	0	--	--	C,F,O	30	50		x	x		Hillside
F-21	30.70379	-97.71244	SH	20	Ked	4	4	1	--	0	--	--	C,F,O	25	45		x	x		Hillside
F-22	30.70510	-97.71038	C/SH	30	Ked	60	50	2.5	--	0	--	--	C,F,O	40	70		x	x		Hillside
F-23	30.70491	-97.71087	SC	20	Ked	1.5	1	1.5	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-24	30.70429	-97.71169	SH	20	Ked	7	7	1	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-25	30.70399	-97.71223	SH/SF	20	Ked	8	8	1.5	N40E	10	--	--	C,F,O	20	50		x	x		Hillside
F-26	30.7047	-97.70947	SH/SC	20	Ked	7	5	7	--	0	--	--	C,F,O	40	60		x	x		Hillside
F-27	30.70450	-97.70913	C/SH	30	Ked	18	16	12	--	0	--	--	C,F,O	70	100		x		x	Streambed
F-28	30.70000	-97.70762	SH	20	Ked	6	6	1	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-29	30.70159	-97.7069	SC	20	Ked	2.5	0.5	1	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-30	30.70095	-97.70721	SC	20	Ked	1	1	1	--	0	--	--	C,F,O	5	25	x		x		Hillside
M-1	30.70598	-97.7004	MB	30	Ked	100	80	4	--	0	--	--	C,F,O	5	35	x		x		Hillside
M-2	30.70442	-97.7124	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside
M-3	30.7046	-97.71195	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside
M-4	30.70443	-97.7114	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside
M-5	30.70477	-97.7105	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside
M-6	30.7045	-97.70972	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside

* DATUM:_____

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Man-made feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials: concrete and/or casing

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.

My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Date: 27 May 2021

Sheet 1 of 1

TCEQ-0585-Table (Rev. 10-01-04)

ATTACHMENT B
STRATIGRAPHIC COLUMN

2021\21081--Lennar_Georgetown_Village\Graphics\21081-001GA_05A_Strat

Geologic Unit	Hydrologic Unit	Approx. Thickness at Project Site (ft)	Elevation (ft msl)	Depth (ft)
			865	0
Georgetown Formation (Kgt)	Edwards Aquifer	20	845	20
Edwards Formation (Ked)		120	725	140
Comanche Peak Limestone (Kc)		70	655	210
Walnut Formation (Kwa)	Confining Unit	175	480	385

Note: Unit elevations and thicknesses given with respect to a ground surface elevation of 865 ft msl on the southern boundary of the subject site.

Horizon Environmental Services, Inc.

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

ATTACHMENT B

Stratigraphic Column
Lennar Georgetown Village
Georgetown, Williamson County, Texas

Horizon
Environmental Services, Inc.

ATTACHMENT C
DESCRIPTION OF SITE GEOLOGY

Geologic information for the subject site obtained via literature review is provided in Attachment E, Supporting Information.

A geologic assessment of the approximately 308-acre Georgetown Village Tract was conducted pursuant to Texas rules for regulated activities on the Edwards Aquifer Recharge Zone (EARZ) (30 TAC 213). The subject site consists of undeveloped pastureland and rangeland located along both sides of Shell Road in Georgetown, Williamson County, Texas. Assessment findings were used to develop recommendations for site construction measures intended to be protective of water resources at the subject site and adjacent areas.

The entire subject site is located within the Edwards Aquifer Recharge Zone (EARZ) as defined by the Texas Commission on Environmental Quality (TCEQ). The EARZ occurs where surface water enters the subsurface through exposed limestone bedrock containing faults, fractures, sinkholes, and caves.

The subject site is predominantly underlain by the undifferentiated Edwards Limestone Formation (Ked) (UT-BEG, 1997) with an estimated maximum thickness of about 120 feet. Overlying the Edwards Formation is the Georgetown Formation, which crops out at higher elevations located in the southern portion of the subject site. The Georgetown Formation has an estimated maximum thickness of about 20 feet at the subject site.

A total of approximately 34 natural geologic features (F-1, F-1.5, F-2, F-3, F-3.5, F-4 to F-6, F-6.5, F-7 to F-12, F-12A, and F-13 to F-30) and 6 man-made features (M-1 to M-6) were identified at the subject site. Further information pertaining to the geologic and man-made features is presented in Attachments D, E, and F. Photographs of the geologic and man-made features are presented in Attachment G. Photographs of geologic features F-1 to F-20 are presented in the attached Cambrian Phase II Karst Survey report (Attachment H).

Horizon
Environmental Services, Inc.

ATTACHMENT D
SITE GEOLOGIC MAP

Qt

F-6
F-4
F-7
F-6.5
F-5
F-3
F-3.5
M-1
F-22
F-23
M-5
F-26
M-3
M-6
F-27
M-2
M-4
F-24
F-25
F-21
F-2
F-20
F-19
Ked
F-1
F-1.5
F-9
F-8
F-29
F-18
F-16
F-30
F-17
F-12a
F-12
F-15
F-28
F-14
F-13
F-10
F-11
Shell Road
Kgt
Kgt

Legend

- Man-Made Feature
- Non-Sensitive Geologic Feature
- Sensitive Geologic Feature
- Subject Site
- Georgetown Limestone (Kgt)
- Terrace Deposits (Qt)
- Edwards Limestone (Ked)

Horizon Environmental Services, Inc.

Date:	04/15/2021
Drawn:	KRS
HJN NO:	21081.001 KS
Source:	Nearmap, 2021; USGS TWSC, 2014

Attachment D

Site Geologic Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

STATE OF TEXAS · JAMES P. KILLIAN · GEOLOGY · No. 10291 · LICENSED PROFESSIONAL GEOSCIENTIST

0 200 400
Feet

21081–Lennar_Georgetown_Village\Graphics\21081-001GA_06A_SGM

Horizon
Environmental Services, Inc.

ATTACHMENT E
SUPPORTING INFORMATION

1.0 INTRODUCTION AND METHODOLOGY

This report and any proposed abatement measures are intended to fulfill Texas Commission on Environmental Quality (TCEQ) reporting requirements (TCEQ, 2005). This geologic assessment includes a review of the subject site for potential aquifer recharge and documentation of general geologic characteristics for the subject site. Horizon Environmental Services, Inc. (Horizon) conducted the necessary field and literature studies according to TCEQ *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones* (TCEQ, 2004).

Horizon walked transects spaced 50 feet apart, mapped the locations of features using a sub-foot accurate Trimble Geo HX handheld GPS, and posted processed data utilizing GPS Pathfinder Office software, topographic maps, and aerial photographs. Horizon also searched the area around any potential recharge features encountered to look for additional features. When necessary, Horizon removed loose rocks and soil (by hand) to preliminarily assess each feature's subsurface extent while walking transects. However, labor-intensive excavation was not conducted during this assessment. Features that did not meet the TCEQ definition of a potential recharge feature (per TCEQ, 2004), such as surface weathering, karren, or animal burrows, were evaluated in the field and omitted from this report.

The results of this survey do not preclude the possibility of encountering subsurface voids or abandoned test or water wells during the clearing or construction phases of the proposed project. If a subsurface void is encountered during any phase of the project, work should be halted until the TCEQ (or appropriate agency) is contacted and a geologist can investigate the feature.

2.0 ENVIRONMENTAL SETTING

2.1 LOCATION AND GENERAL DESCRIPTION

The subject site consists of approximately 308 acres of mostly undeveloped pastureland and rangeland located along both sides of Shell Road in Georgetown, Williamson County, Texas (Attachment F, Figure 1) (Appendix F, Figure 1).

2.2 LAND USE

The subject site is currently undeveloped pastureland and rangeland used to raise beef cattle. Surrounding lands are generally used for agricultural and single-family residential and/or commercial retail purposes.

2.3 TOPOGRAPHY AND SURFACE WATER

The subject site is situated on gently to moderately sloping terrain that is located within the Berry Creek watershed (Attachment F, Figures 2 and 3). Surface elevations on the subject site vary from a minimum of approximately 765 feet above mean sea level (amsl) near the northeastern property corner adjacent to Berry Creek to a maximum of approximately 845 feet

amsl near the southern property boundary along Bellaire Drive (USGS, 2019). Drainage on the site occurs primarily by overland sheet flow from south to north. Additionally, an unnamed tributary of Berry Creek bisects the eastern portion of the site, which drains from southwest to northeast into a small, man-made stock pond (M-1) and into Berry Creek. Berry Creek is located immediately north of the subject site and drains from west to east eventually into the San Gabriel River.

2.4 EDWARDS AQUIFER ZONE

The entire subject site is located within the Edwards Aquifer Recharge Zone (EARZ) (TCEQ, 2021) (Attachment F, Figure 2). The Recharge Zone is described as an area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer.

2.5 SURFACE SOILS

Four soil units are mapped within the subject site (NRCS, 2021) (Attachment F, Figure 4). Generally, the soil series are similar in their physical, chemical, and engineering properties, with the principal exception being rock fragment content and thickness. The soil units are described in further detail below.

Doss silty clay, 1 to 5% slopes (DoC): This is a gently sloping soil that occurs on uplands. Typically, this soil has a dark grayish-brown, silty clay surface layer about 9 inches thick. The subsoil, to 19 inches, is brown, silty clay loam. The underlying material is weakly cemented limy earth interbedded with fragments of limestone. This soil is calcareous and moderately alkaline. This soil is well-drained and has a low available water capacity. Permeability is moderately slow and runoff is medium. Erosion is a moderate hazard (Werchan and Coker, 1983).

Eckrant extremely stony clay, 0 to 3% slopes (EeB): Typically, this soil has an extremely stony, very dark gray, clay surface layer about 11 inches thick. The underlying material is indurated limestone. About 25% of the surface is covered with fragments of limestone; most are about 6 inches across, but range from 3 inches to 3 feet across and are as much as 10 inches thick. The soil is calcareous, moderately alkaline, and well-drained. Permeability is moderately slow and surface runoff is rapid. The fragments of limestone on the surface help to prevent erosion. The available water capacity is very low because of the shallowness of the soil and stones in the soil (Werchan and Coker, 1983).

Eckrant-Rock outcrop association, 1 to 10% slopes (ErE): This unit occurs along hills, ridges, and on sides of drainageways on uplands. This complex is made up of about 70% Eckrant soils, 15% Rock outcrop, and 15% other soils. Typically, the surface layer of Eckrant soils is calcareous, moderately alkaline, dark grayish-brown, extremely stony clay about 8 inches thick. The underlying material is fractured, indurated limestone. Fragments of limestone from 6 inches to 2 feet across cover about 35% of the surface. Rock outcrop consists of exposed limestone bedrock in narrow bands within areas of Eckrant soils. Loose cobbles and stones on the surface

are common. Permeability is moderately slow and surface runoff is rapid. The available water capacity is very low (Werchan and Coker, 1983).

Georgetown stony clay loam, 1 to 3% slopes (GsB): This a gently sloping soil that occurs within central upland areas of the subject site. Typically, this soil has a slightly acidic, brown, stony clay loam surface layer about 7 inches thick, and few stones on or near the surface. The subsoil, which extends down to a depth of about 35 inches, is neutral, reddish-brown clay in the upper part and slightly acidic, reddish-brown, cobbly clay in the lower part. The underlying material is indurated, fractured limestone that has clay loam in crevices and fractures. This soil is well-drained. Permeability is slow and surface runoff is medium. The available water capacity is low. Reaction is neutral to slightly acidic and erosion is a slight hazard (Werchan and Coker, 1983).

2.6 WATER WELLS

A review of TCEQ and Texas Water Development Board (TWDB) records revealed 1 water well (No. 5819406) on the subject site and 17 wells within 0.5 miles of the subject site (TCEQ, 2021; TWDB, 2021). According to the TWDB records, the on-site well is completed within the Trinity Aquifer with no depth reported; however, this well was not found during the site survey and may no longer exist. Most of the off-site wells are reportedly completed within the Trinity Aquifer at total depths ranging from 800 to 970 feet below surface grade. Some of the off-site wells (Nos. 5819103, 390356, 439815, 439817, and 410122) are reportedly completed within the Edwards Aquifer at total depths ranging from 140 to 200 feet below surface grade. Horizon observed no wells on the subject site.

The results of this assessment do not preclude the existence of undocumented/abandoned wells on the site. If a water well or casing is encountered during construction, work should be halted near the feature until the TCEQ is contacted.

2.7 GEOLOGY

Literature Review

A review of existing literature shows most of the subject site is underlain by the undifferentiated Edwards Limestone Formation (Ked) (UT-BEG, 1997), with an estimated maximum thickness of about 120 feet. The Edwards Formation consists mostly of gray to light brownish-gray, thin to medium-bedded, dense dolomite, dolomitic limestone, and limestone.

Overlying the Edwards is the Georgetown Formation, which crops out in higher elevated areas located in the southern portion of the subject site. It generally consists of limestone and marl with an estimated maximum thickness of about 20 feet. The limestone is fine-grained, argillaceous, nodular, moderately indurated, and light gray; some limestone is hard, brittle, thickbedded, and white. Marine megafossils include *Kingena wacoensis* and *Gryphaea washitaensis* (UT-BEG, 1995).

The site Stratigraphic Column is provided as Attachment B, and the Site Geologic Map is Attachment D.

The subject site is located within the Balcones Fault Zone. Available geologic reports indicate the nearest mapped fault is located approximately 2 miles to the northeast (UT-BEG, 1995). In general, the rock strata beneath the site dip to the east-southeast at about 10 to 30 feet per mile (less than 1°). The site Stratigraphic Column is provided as Attachment B, and the Site Geologic Map is Attachment D.

Field Assessment

Please see Attachment C for a narrative description of geology observed on the subject site. The Site Geologic Map is provided as Attachment D. Horizon observed 34 naturally occurring geologic features (F-1, F-1.5, F-2, F-3, F-3.5, F-4 to F-6, F-6.5, F-7 to F-12, F-12A, and F-13 to F-30) and 6 man-made features (M-1 to M-6) on the subject site that meet the TCEQ definition of a potential recharge feature. No springs or spring runs were identified at the subject site.

It is of note that the entrance to Bat Well Cave is located off-site within an unnamed tributary of Berry Creek that runs along the northwestern side of the subject site. However, part of this cave's mapped footprint extends beneath the subject site toward the southeast and northwest for approximately 300 feet.

Geologic features identified on the subject site are described as follows:

Geologic Feature F-1: Originally described as a large upland sinkhole located in an open area immediately west of subject site boundary. The feature measures approximately 20 feet in diameter by (x) 1.5 feet deep, with several small drainage portal openings among large rocks and cobbles near the center, in an area measuring about 6 feet long x 3 feet wide x 3 feet deep. Moderate to high air flow conductivity was noted at all the openings. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 4 feet below the surface. Based on the presence of air flow conductivity and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential cave, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian Environmental (Cambrian) excavated this feature (17 feet long x 10.5 feet wide x 5.5 feet deep) using a backhoe and classified the feature as a cave that measures 250 feet long x 170 feet wide (see attached Phase II Karst Survey [KS] report by Cambrian). The cave entrance measures approximately 4 feet long x 0.5 to 1 foot high. The cave trends along a N55W rock joint fracture. When Horizon conducted the most recent geologic assessment, the cave had been filled in with material due to the improper placement of excavated spoil piles immediately upslope of the cave entrance. This feature has a high infiltration rate and an apparent surface runoff catchment of less than 1 acre.

Geologic Feature F-1.5: This feature was discovered by Cambrian during their Phase II KS. It was originally described as being a small solution cavity measuring approximately 1 foot

in diameter x 8 inches deep. Sometime between June and August 2017, Cambrian conducted excavation of the feature using a backhoe (10.5 feet long x 7 feet wide x 3 feet deep). The feature was determined to have slight air flow conductivity at the opening. The feature has an intermediate infiltration rate and surface runoff catchment of less than 0.4 acres.

Geologic Feature F-2: Upland sinkhole measuring approximately 10 feet in diameter x 1 foot deep that funnels into an area near its center that had several small drainage portal openings among loose rocks. High to very high air flow conductivity was noted at all of the openings. After limited hand excavation, the drainage portal area was enlarged and measured about 2 feet in diameter x 3 feet deep among more loose rocks/cobbles. A bedrock headwall was observed about 4 feet below the surface with additional void space of unknown extent below. Based on the presence of air flow conductivity, well-defined drainage portal openings, and apparent void space, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Somewhere between June and August 2017, Cambrian excavated the feature with hand tools (2 feet long x 1.5 feet wide x 4 feet deep) and deemed the feature to be a cave with a 15-foot-diameter footprint extending to the east of the entrance. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-3: Upland sinkhole measuring approximately 10 feet in diameter x 1 foot deep, with small (<2 inches), semi-open drainage portals among loose to firm clayey soil infilling. Very slight air flow conductivity was noted at the portal openings. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles about 2 feet below the surface. This feature has a very low infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-3.5: This feature was discovered by Cambrian during their Phase II KS (originally labeled as F-3, now F-3.5 by Horizon). It was originally described as an upland sinkhole located approximately 100 feet southeast of F-3. Sometime between June and August 2017, Cambrian excavated the feature with a backhoe (17.5 feet long x 6.5 feet wide x 4 feet deep) and deemed the feature to be non-sensitive. No open portals and/or voids were found in the floor of the feature. This feature has a very low infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-4: Solution cavity/solution enlarged fracture (azimuth: N280W) measuring approximately 3 feet long x 2 feet wide x 4.5 feet deep, with loose soil and rock infilling. Moderate air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 6 feet below the surface. Sometime between June and August 2017, Cambrian excavated the feature using a backhoe (3 feet long x 2.5 feet wide x 3 feet deep) until bedrock was encountered. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-5: Large upland sinkhole located within an unnamed tributary of Berry Creek. The feature measures approximately 20 feet long x 15 feet wide x 3 feet deep, with several small drainage portal openings among loose rocks and cobbles near the center. High air

flow conductivity was noted at all the openings. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 4 feet below the surface. Based on the presence of air flow conductivity and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian excavated the feature using a backhoe (3.5 feet long x 3.5 feet wide x 4 feet deep) and determined the feature was a solution cavity. Horizon staff investigated the feature further and noted a bedding plane at the bottom of the feature that extends at least 10 feet to the south where it appeared to drop down. Horizon did not agree with Cambrian's findings; in Horizon's opinion, this feature should have been considered a potential cave until subsequent mechanical excavation could prove otherwise. Horizon staff excavated the feature on 11 May 2021 using a backhoe with hoe ram attachment and finished on 14 May 2021. Excavation dimensions measured approximately 30 feet long x 16 feet wide x 1.5 feet deep. Most of the excavated area containing no portals and/or voids was filled back in with rock to reduce the hazard risk to livestock on the site. The deeper end of the excavation measures approximately 12.5 feet long x 8 feet wide x 8 feet deep. Near the floor of the excavation, the feature opens into an extensive, low (<3 feet high) horizontal bedding plane void that extends from northwest to southeast for approximately 56 feet. This feature was classified as a **cave** based on it being a natural underground open space formed by the dissolution of limestone that is large enough for an average-sized person to enter. Horizon staff began hand excavation and exploring the cave on 13 May 2021. After checking/hand-digging all possible leads, the primary drain for surface water runoff was determined to be located underneath a headwall at the northern end of the cave (~9 feet northeast of survey station no. 4). However, the drainage area lacked air flow conductivity and was too low to continue to pursue. During heavy rain recharge events, water flows into a secondary drain located along the northwestern end of the cave (near survey station no. 9). This drainage area also lacked air flow conductivity and was too low to pursue. The floor of the feature was composed of small to large breakdown pieces that are partially covered with clay and soils that have washed out. Of note, the floor and ceilings of the cave were covered with loose organic material such as twigs, leaves, and soils, indicating that the entire cave floods during heavy rainfall events. Horizon staff surveyed and mapped the cave, which has been officially named **Diluvio Cave** for identification purposes, on 20 May 2021. The footprint of the cave trends from northwest to southeast from the entrance of the cave. The cave is approximately 56 feet long (northwest to southeast) and 50 feet from north to south at the widest section of the cave (near survey stations nos. 1 and 4). Most of the cave is approximately 25 feet wide. Interior ceiling heights in the cave range from less than 0.5 feet to 3 feet. This cave is a significant recharge feature with a high infiltration rate and an apparent surface runoff catchment of greater than 1.6 acres due to its location within an extensive, unnamed drainage tributary of Berry Creek.

Geologic feature F-6: Large upland sinkhole located in an open area measuring about 35 feet long x 30 feet wide x 5 feet deep, with several boulders and large rocks apparently placed into the deeper recessed portions. Numerous drainage portals of various sizes are located throughout the rock debris. Slight to moderate air flow conductivity was noted at the openings. Based on the feature's overall size, the apparent placement of large rocks, the presence of air flow conductivity, and numerous drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential

cave, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian excavated the feature using a backhoe (20 feet long x 7 feet wide in the middle and 12.5 feet wide at the edge of the feature x 10 feet deep) and deemed the feature to be a **cave**. The cave is a single bedding plane room that extends 25 feet from southwest to northeast and 17.5 feet long from north to south. The bedding plane is approximately 1 to 1.5 feet high throughout the room. One small drain was noted in the easternmost corner past a humanly impassable passage. Numerous excavated spoil piles and large rocks are located around the cave entrance. This feature has a high infiltration rate and an apparent surface runoff catchment less than 1 acre.

Geologic Feature F-6.5: This feature was discovered by Cambrian during their Phase II KS. It was originally described as being a solution cavity measuring approximately 1.5 feet long x 0.6 feet wide x 0.5 to 1 foot deep with a rock joint fracture (azimuth: N10W). This feature is located approximately 50 feet northeast of F-7. Sometime between June and August 2017, Cambrian conducted mechanical excavation of the feature using a backhoe (26 feet long x 16.5 feet wide x 4 feet deep). However, upon recent inspection by Horizon, no portals and/or voids were observed in the floor or the walls of the excavated feature. In addition, spoil piles from mechanical excavation were left upslope of the feature. This feature has a very low infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-7: Small upland sinkhole measuring approximately 7 feet in diameter x 1 foot deep, with an open drainage portal about 0.5 feet in diameter x 1 foot deep near the center. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered a solution-enlarged fracture about 3 feet below the surface measuring 2.5 feet long x 1 foot wide x 5.5 feet deep (azimuth: N330°W). Sometime between June and August 2017, Cambrian conducted mechanical excavation of the feature using a backhoe (12.5 feet long x 11 feet wide x 1.5 feet deep) in a T shape. The main drainage portal near the center of the excavation measures 1.5 feet in diameter and 4.5 feet deep. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-8: Upland sinkhole located in an open pasture area that appears to have been chained and/or bulldozed many (>50) years ago. The feature measures approximately 12 feet long x 10 feet wide x 2.5 feet deep, and funnels to a semi-open area about 3 feet long x 1.5 feet wide x 3.5 feet deep, with several drainage portal openings of various sizes among rocks and cobbles. This feature appears to have been partially filled with disturbed rock and soil material, possibly during past chaining/bulldozing. Slight to moderate air flow conductivity was noted at all of the openings. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 4 feet below the surface. Based on the presence of air flow conductivity, the apparent placement of fill material, and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian conducted mechanical excavation of the feature using a backhoe (13 feet long x 7 feet wide x 5.5 feet deep)

and deemed the feature to be a cave. However, upon further investigation by Horizon, this feature lacks sufficient human-navigable passage to be considered a cave by Texas Speleological Survey (TSS) standards. This feature has a high infiltration rate and an apparent surface runoff catchment of less than 1 acre.

Geologic Feature F-9: Upland sinkhole located in an open area that measures approximately 20 feet long x 15 feet wide x 2.5 feet deep. This feature appears to have been partially filled with large rocks and/or soil debris, possibly during past chaining/bulldozing. Several drainage portal openings of various sizes occur among the fill material. Slight to moderate air flow conductivity was noted at all the openings. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 4 feet below the surface. Based on the presence of air flow conductivity, the apparent placement of fill material, and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian mechanically excavated the feature using a backhoe (19 feet long x 15 feet wide x 6 feet deep) and deemed the feature to be a **cave**. The subsurface passage is a single room approximately 15 feet in diameter that extends to the south from the excavated entrance. This feature has a high infiltration rate and an apparent surface runoff catchment of less than 1 acre.

Geologic Feature F-10: Large upland sinkhole measuring approximately 35 feet long x 25 feet wide x 7.5 feet deep, with an exposed vertical rock headwall along the western side of the sink. Several hackberry trees are growing inside this sinkhole. An open drainage portal about 2.5 feet long x 1.5 feet wide x 2 feet deep was found along the southwestern corner of the sink floor next to the headwall. Moderate air flow conductivity was noted at the opening. After limited hand excavation, this opening was enlarged, and void space large enough to enter could be seen to the left, trending from northeast to southwest. After crawling down through the opening, a larger void passage was encountered that measured about 35 feet long x 10 to 12 feet wide x 3 to 8 feet high. Several internal open drains were observed along the floor at the lowest points of the void passage. In addition, cave crickets and a few tricolored bats (formerly known as eastern pipistrelle) were observed inside the void passage. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian explored the cave during their Phase II KS and noted that the cave is 25 feet long and 10 feet wide extending from the sinkhole rim to the southwest. This cave has a very high infiltration rate and a surface runoff catchment of less than 1 acre.

Geologic Feature F-11: Potential upland sinkhole measuring approximately 20 feet in diameter x 1.5 feet deep, with several thin, flat rocks and soil debris apparently placed into the feature. No drainage portals or air flow conductivity were identified in the feature. Somewhere between June to August of 2017, Cambrian excavated the feature using hand tools and deemed the feature to be non-sensitive. Cambrian noted this feature was likely due previous land clearing activities. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-12: Upland sinkhole located in wooded area measuring approximately 8 feet in diameter x 1.5 feet deep that had several medium-sized rocks placed near its center. Numerous small drainage portals were found among the rocks, and high air flow conductivity was noted at all the openings. After limited hand excavation, a solution cavity about 4.5 feet long x 2 feet wide x 4 feet deep, with small drainage portal openings along 2 sides, was exposed. Based on the presence of air flow conductivity and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Somewhere between June to August of 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be sensitive but not a cave. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-12A: Small semi-open solution cavity located approximately 20 feet northwest of feature F-12, measuring approximately 1 feet long x 0.5 feet wide x 1 foot deep, with loose soil and rock infilling. Slight to moderate air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 2 feet below the surface. Somewhere between June to August of 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be sensitive but not a cave. This feature has a low to intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-13: Upland sinkhole measuring approximately 20 feet long x 6 feet wide x 2 feet deep, with 2 small (<2 inches) semi-open drainage portals about 12 feet apart among loose to firm clayey soil infilling. This feature appears to be partially filled with small rock and/or soil debris. Slight air flow conductivity was noted at the portal openings. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles about 3 feet below the surface. Somewhere between June to August of 2017, Cambrian mechanically excavated the feature using a backhoe (16.5 feet long x 4 to 11 feet wide x 7.5 feet deep) and deemed this feature to be a cave filled with soil. However, Horizon investigated the feature further and determined the feature is an upland sinkhole that lacks sufficient human- navigable passage to be considered a cave by TSS standards. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-14: Solution-enlarged fracture measuring approximately 3 feet long x 0.5 feet wide x 1.5 feet deep (azimuth: N295°W), with apparent semi-open drainage portals and slight air flow conductivity. After limited hand excavation, probing with a steel rod encountered loose clay and cobbles about 2.5 feet below the surface. Sometime between June and August 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be non-sensitive. No open portals and/or voids were found in the floor of the feature. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-15: Small upland sinkhole measuring approximately 7 feet long x 5 feet wide x 1.5 feet deep that funnels into an open drainage portal about 1 foot long x 0.5 feet wide x 1 foot deep among loose rocks. High air flow conductivity was noted at the opening. After limited hand excavation, the drainage portal area was enlarged, and measured about 2 feet in

diameter x 1.5 feet deep, narrowing for another 0.5 feet below before widening again with additional void space below of unknown extent. Based on the presence of air flow conductivity, well-defined drainage portal openings, and apparent void space, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian mechanically excavated the feature using a backhoe (10 feet long x 4 to 8 feet wide x 3 feet deep) and deemed the feature to be sensitive but not a cave. The opening on the surface extends horizontally beneath a bedding plane for approximately 4 feet. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-16: Solution cavity measuring approximately 3 feet long x 2 feet wide x 1.5 feet deep with loose soil infilling. The feature undercuts toward the north about 1 foot high and 2 feet long with an apparent animal burrow. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 2 feet below the surface. Sometime between June and August 2017, Cambrian mechanically excavated the feature using a backhoe (12 feet long x 10 feet wide x 2 feet deep) and deemed the feature to be non-sensitive. No open portals and/or voids were found in the floor of the feature. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-17: Small drainage portal opening (0.5 feet in diameter) within the top of an underlying solution cavity measuring about 5 feet long x 3 feet wide x 3 feet high, with a dark grayish-brown soil and rock floor. Moderate to high air flow conductivity was noted at the opening. After limited hand excavation, the hole was widened (to 2.5 feet long x 1.5 feet wide), revealing additional void horizontal passages surrounding the cavity in all directions. After entering the cavity, a low (3 feet down to 1 foot high) bedding plane void passage continued toward the northwest, east, and southeast for about 6 to 8 feet from the surface opening. Another apparent bedding plane void area could be seen (though not entered without enlargement) to the south/southeast through an opening (2 feet wide x 1 foot high) along the southwestern side wall that drops into another passage (3 feet high x 4 feet wide, with an unknown length). This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Somewhere between June and August 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be a cave. The cave consists of 2 low and wide rooms that extend a total of 25 feet to the south. This cave has a very high infiltration rate and a surface runoff catchment of less than 1 acre.

Geologic Feature F-18: Small upland sinkhole measuring approximately 5 feet in diameter x 1 foot deep that funnels into an open drainage portal about 0.5 feet in diameter x 1 foot deep among loose rocks and soil. Moderate to high air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 2 feet below the surface. Based on the presence of air flow conductivity and a well-defined drainage portal opening, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it

being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian excavated the feature by hand (7 feet long x 2.5 to 4 feet wide x 3 feet deep) during their Phase II KS and deemed this feature to be a solution cavity but not a cave. This feature has a low to intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic feature F-19: Large upland sinkhole measuring about 30 feet long x 25 feet wide x 3 feet deep, with multiple drainage portal openings among rocks, cobbles, and loose soil. Moderate to high air flow conductivity was noted at the openings. Based on the feature's overall size, the presence of air flow conductivity, and numerous drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian mechanically excavated the feature using a backhoe (14 feet long x 8.5 feet wide x 7 feet deep) and deemed the feature to be a cave. The cave was noted to be approximately 40 feet in diameter with a maximum depth of 20 feet below the surface. During Horizon's subsequent site investigation, the cave entrance had been filled in with material from improperly placed spoil piles immediately upslope of the excavation. This feature has a high infiltration rate and an apparent surface runoff catchment less than 1 acre.

Geologic feature F-20: Upland sinkhole measuring about 20 feet in diameter x 3 feet deep, with a small drainage portal opening among rocks, leaves, and loose soil. Moderate to high air flow conductivity was noted at the openings. Based on the feature's overall size, the presence of air flow conductivity, and an open drainage portal, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be a solution cavity but not a cave. Horizon staff further investigated the feature and determined that the feature is an upland sinkhole with a solution cavity drainage portal. This feature has an intermediate infiltration rate and an apparent surface runoff catchment less than 0.4 acres.

Geologic feature F-21: Small upland sinkhole measuring approximately 4 feet in diameter x 1 foot deep with a solution cavity drainage portal among rocks, leaves, and loose soil near the center of the sink. The drainage portal measures 1 foot in diameter x 3.5 feet deep and was noted to have slight air flow conductivity at the opening. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic feature F-22: Large upland sinkhole measuring approximately 60 feet long x 50 feet wide x 2.5 feet deep. Multiple drainage portals among rocks and loose soil were found near the center of the sink, with the largest portal being approximately 3 feet long x 1.5 feet wide x 2 feet deep. The feature was noted to have slight to moderate air flow conductivity near the opening. Horizon staff began excavation of the feature on 14 May 2021 using a backhoe with hoe ram attachment and finished on 18 May 2021. Excavation dimensions measure approximately 16 feet long x 13 feet wide x 9.5 feet deep. The main entrance excavation measures approximately 11 feet long x 6.5 feet wide x 9.5 feet deep. Approximately 5 feet below the surface is a low

bedding plane that wraps around the feature from the southeast to the northeast. This feature was classified as a **cave** based on it being a natural underground open space formed by the dissolution of limestone that is large enough for an average-sized person to enter. Horizon staff began hand excavation and exploration of the cave on 18 May 2021. After checking/hand-digging all possible leads, the primary drain for surface water runoff was determined to be located at the southern end of the cave (approximately ~8.5 feet southeast from survey station no. 0) toward Bat Well Cave. The drainage portal lacked air flow conductivity and has been massively filled with clay, dirt, and loose soils. It is of note that the cave is approximately 50 feet from the footprint of Bat Well Cave and trending in line with the previously discovered cave. It is possible that the drainage portal to the southeast could lead to Bat Well Cave but has been massively filled with clay, dirt, and loose soils. A secondary drain was discovered in the northernmost portion of the cave; however, the drainage area lacked air flow conductivity and was too low to continue to pursue. The floor of the feature was covered with thick layers of loose soil/clay that have been washed into the sink for many years. Horizon staff surveyed and mapped the cave, which has been officially named **Bat Well Sink Cave** for identification purposes, on 19 May 2021. The total footprint of the cave trends northwest to southeast from the entrance of the cave. The cave is approximately 38 feet long (from northwest to southeast) and 23 feet from northeast to southwest at the widest section of the cave (near survey stations nos. 3, 4, 5 and 2A). Most of the cave is approximately 10 feet wide. Interior ceiling heights in the cave range from less than 0.5 feet to 3 feet. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 1 acre. Of note, this cave is located approximately 50 feet from the footprint of Bat Well Cave and trending in line with the previously discovered cave. It is therefore possible that Bat Well Sink Cave may be connected and/or provide additional recharge input into Bat Well Cave.

Geologic feature F-23: Small solution cavity measuring approximately 1.5 feet long x 1 foot wide x 1.5 feet deep. During the initial site investigation, the feature was noted to have slight air flow conductivity. Horizon staff excavated the feature on 18 May 2021 using a backhoe with hoe ram attachment. The excavation measured approximately 9.5 feet long x 6.5 feet wide x 2.5 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Geologic feature F-24: Small upland sinkhole measuring approximately 7 feet in diameter x 1 foot deep. One small, semi-open drainage portal was found near the center of the sink among rocks and loose soils. During the initial site investigation, the feature was noted to have slight air flow conductivity. Horizon staff excavated the feature on 18 May 2021 using a backhoe with hoe ram attachment. The excavation measured approximately 10.5 feet long x 10 feet wide x 1.5 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Geologic feature F-25: Small upland sinkhole measuring approximately 8 feet long x 1.5 feet deep. Near the center of the sink is a solution-enlarged fracture (azimuth: N40E) that is approximately 4 feet long x 0.5 feet wide x 3 feet deep. During the initial site investigation, the

feature was noted to have slight air flow conductivity. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic feature F-26: Small upland sinkhole measuring approximately 7 feet long x 5 feet wide x 1.5 feet deep. Near the center of the sink is a rock-choked solution cavity that is 1 foot in diameter x 7 feet deep. During the initial site investigation, the feature was noted to have moderate to high air flow conductivity. Based on the presence of air flow conductivity, the potential for additional subgrade passage is very probable. The characteristics of the feature meet the requirements to be classified as a potential **cave**. Of note, this feature is located directly over the footprint of Bat Well Cave and is most likely connected and/or provides additional recharge input to this cave. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic feature F-27: Historically known cave located off of the subject site. This cave is gated off and located within an unnamed tributary of Berry Creek. The cave was mapped and surveyed in May 1962 by Richard Finch, B. Wall, G. Davis, and D. Lemons of the Southwestern Speleological Society and officially named **Bat Well Cave.** Additionally, this cave was resurveyed and mapped in 1992 by Bill Russell and Jon Hunter (see attached cave map). The total surveyed passage of the cave is 1080 feet from northwest to southeast. The northwestern portion reportedly contained one of the larger bat colonies in Williamson County and was previously used for mining guano in 1909. The northwestern and southeastern portions of the cave footprint extend into the subject site boundaries. This cave is a significant recharge feature with a very high infiltration rate and an apparent surface runoff catchment of greater than 1.6 acres due to its location within an extensive unnamed tributary of Berry Creek

Geologic feature F-28: Small upland sinkhole measuring approximately 6 feet in diameter x 1 foot deep. Near the center of the sink, among rocks and loose soils, is a solution cavity that measures approximately 2 feet long x 0.8 feet wide x 1 foot deep. During the initial site investigation, slight air flow conductivity was noted at the opening. Horizon staff excavated the feature on 19 May 2021 using a backhoe with hoe ram attachment. The excavation measures approximately 8 feet long x 5 feet wide x 3 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Geologic feature F-29: Small solution cavity measuring approximately 2.5 feet long x 0.5 feet wide x 1 foot deep. During the initial site investigation, the feature was noted to have very slight air flow conductivity. Horizon staff excavated the feature on 18 May 2021 using a backhoe with hoe ram attachment. The excavation measured approximately 8 feet long x 6 feet wide x 3.5 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Geologic feature F-30: Small solution cavity measuring approximately 1 foot in diameter x 1 foot deep. During the initial site investigation, the feature was noted to have slight air flow conductivity. Horizon staff excavated the feature on 18 May 2021 using a backhoe with hoe ram attachment. The excavation measured approximately 4 feet long x 3 feet wide x 1.5 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Man-made features identified on the subject site are described as follows:

Man-made feature M-1: Dry man-made stock pond measuring approximately 98 feet long x 68 feet wide x 5 feet deep. The pond has a clay-lined floor and no portals and/or voids were observed in the floor of the feature.

Man-made features M-2 to M-6: City of Georgetown sanitary sewer manholes measuring approximately 3 feet in diameter. No leaks were noticed surrounding these features. The sanitary sewer appears to be in good working condition.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Twenty-three geologic features (F-1, F-1.5, F-2, F-4, F-5, F-6, F-7, F-8, F-9, F-10, F-12, F-12A, F-13, F-15, F-17, F-18, F-19, F-20, F-21, F-22, F-25, F-26, and F-27) have been evaluated as sensitive for groundwater recharge capability and would therefore require a TCEQ protective setback buffer. In general, a protective buffer encompassing a sensitive feature is recommended to meet the TCEQ guidance for a setback of at least 50 feet in all directions from the feature's areal extent (perimeter), plus its watershed catchment up to 200 feet from the perimeter of the feature. However, larger protective buffers for 10 of these features (F-1, F-2, F-5, F-6, F-9, F-10, F-17, F-19, F-22, and F-27) are recommended to meet the TCEQ guidance for setbacks of caves with mapped subsurface footprints. Caves with a known subsurface footprint (i.e., surveyed/mapped) include a protective buffer zone extending an additional 50 feet in all directions from the footprint, plus the cave's watershed catchment up to 200 feet from the footprint.

Eleven geologic features (F-3, F-3.5, F-6.5, F-11, F-14, F-16, F-23, F-24, F-28, F-29 and F-30) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers. No further action is recommended for these non-sensitive geologic features. In addition, the man-made features on the site (M-1, M-2, M-3, M-4, M-5, and M-6) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers.

Most of the site generally appears well-suited to development prospectuses. It should be noted that soil and drainage erosion would increase with ground disturbance. Native grasses and the cobbly content of the soil aid to prevent erosion. Soil and sedimentation fencing should be placed in all appropriate areas prior to any site disturbing activities.

Because the subject site is located over the Edwards Aquifer Recharge Zone, it is possible that subsurface voids underlie the site. If any subsurface voids are encountered during site development, work should halt immediately so that a geologist may assess the potential for the void(s) to provide meaningful contribution to the Edwards Aquifer.

4.0 REFERENCES

(CAPCOG) Capital Area Council of Governments. 5-foot contours, CAPCOG Center for Regional Development, Austin, Texas. Updated 2015.

(Nearmap) Nearmap US PhotoMaps. Created by Nearmap_Engineering 20 April 2017. Imagery date 16 April 2021.

(NRCS) Natural Resources Conservation Service (formerly the Soil Conservation Service) US Department of Agriculture, Engineering Division. *Soil Series and Hydrologic Soil Groups of Urban Hydrology for Small Watersheds*, Technical Release No. 55. January 1975.

_____. Web Soil Survey, <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey. aspx>. Soil map data layer updated 12 September 2019. Accessed 27 May 2021.

(OSM) OpenStreetMap contributors. OpenStreetMap, <http://www.openstreetmap .org>. Available under the Open Database License (www.opendatacommons.org/ licenses/odbl). Accessed 23 April 2021.

(TCEQ) Texas Commission on Environmental Quality. *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones*. Revised October 2004.

_____. RG-348, *Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices.* Revised July 2005.

_____. Edwards Aquifer Protection Program. Edwards Aquifer Viewer, <http://www.tceq.state. tx.us/field/eapp/viewer.html>. Accessed 27 May 2021.

(TWDB) Texas Water Development Board. Water Information Integration and Dissemination System. TWDB Groundwater Database, <https://www3.twdb.texas.gov/apps/ waterdatainteractive/groundwaterdataviewer>. Accessed 27 May 2021.

(TWSC) United States Geological Survey, Texas Water Science Center. Geologic Database of Texas, <https://txpub.usgs.gov/txgeology/>. Updated 1 February 2014; Accessed 27 May 2021.

(UT-BEG) University of Texas Bureau of Economic Geology. Collins, E.W. *Geologic Map of the Georgetown Quadrangle, Texas*. 1997.

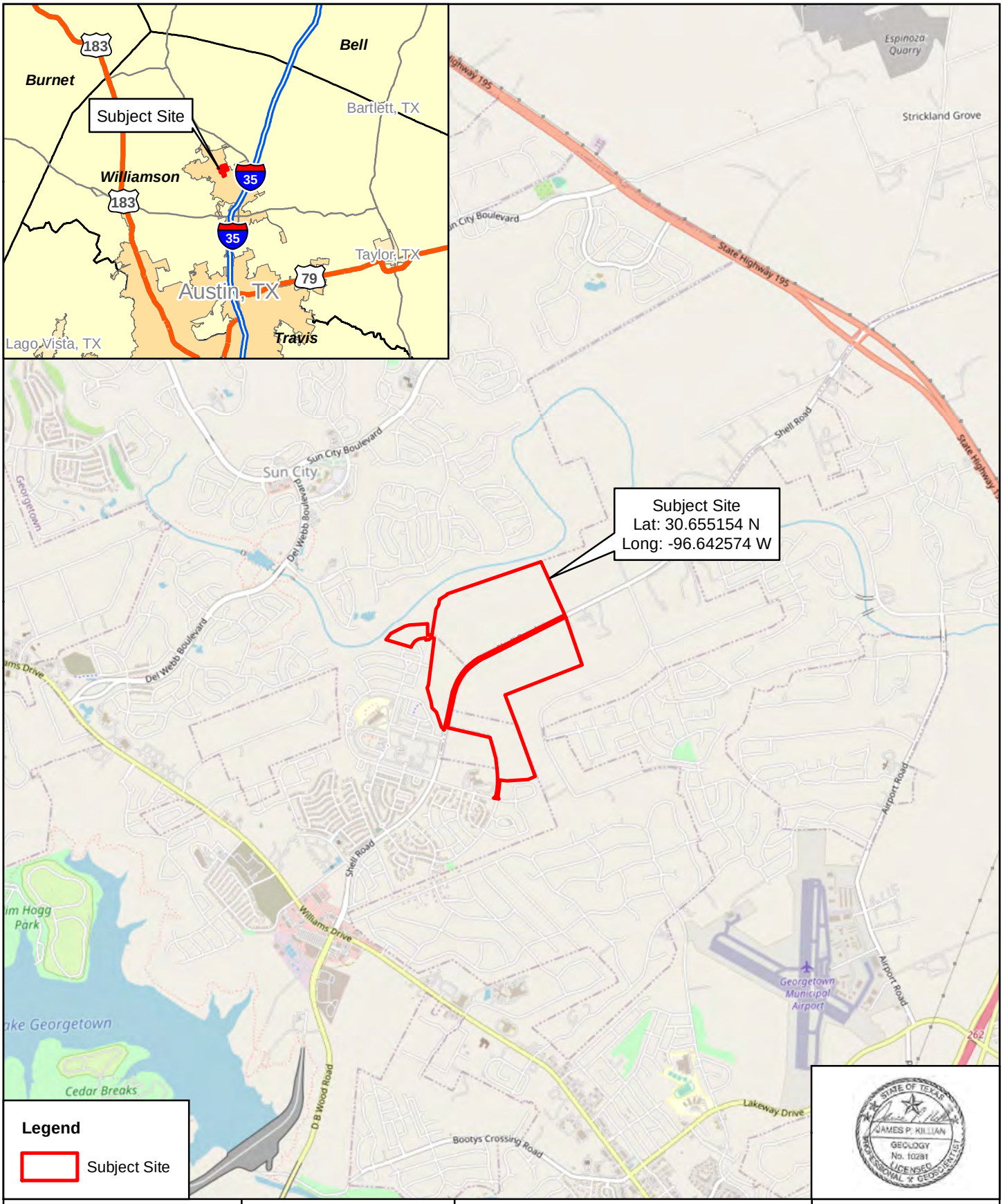
_____. C.V. Proctor, Jr., T.E. Brown, J.H. McGowen, N.B. Waechter, and V.E. Barnes. Geologic Atlas of Texas, Austin Sheet. Francis Luther Whitney Memorial Edition. Revised 1995.

(USGS) US Geological Survey. 7.5-minute series topographic maps, Georgetown, Texas, quadrangle. 2019.

Werchan, L. E., and J. L. Coker. Soil survey of Williamson County, Texas. US Department of Agriculture, Natural Resources Conservation Service (formerly Soil Conservation Service), in cooperation with the Texas Agricultural Experiment Station. 1983.

ATTACHMENT F

ADDITIONAL SITE MAPS



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Horizon Environmental Services, Inc.

Date:	04/23/2021
Drawn:	KRS
HJN NO:	21081.001 GA
Source:	OSM, 2021

Attachment F, Figure 1

Vicinity Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

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Feet

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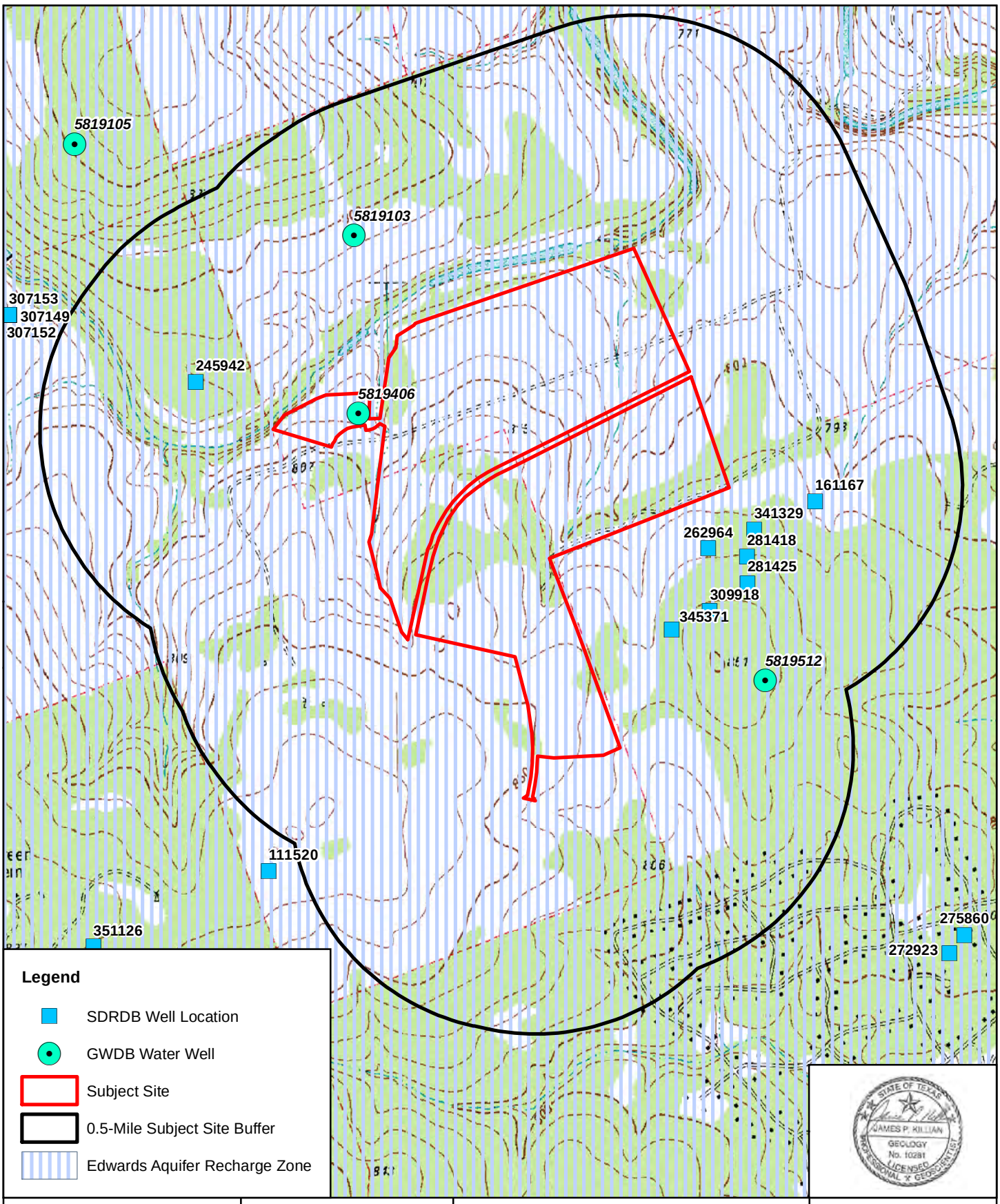

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Date:	04/23/2021
Drawn:	KRS
HJN NO:	21081.001 GA
Source:	TCEQ, 2021; TWDB, 2021; USGS, 1995

Attachment F, Figure 2

Topography and Hydrogeology Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

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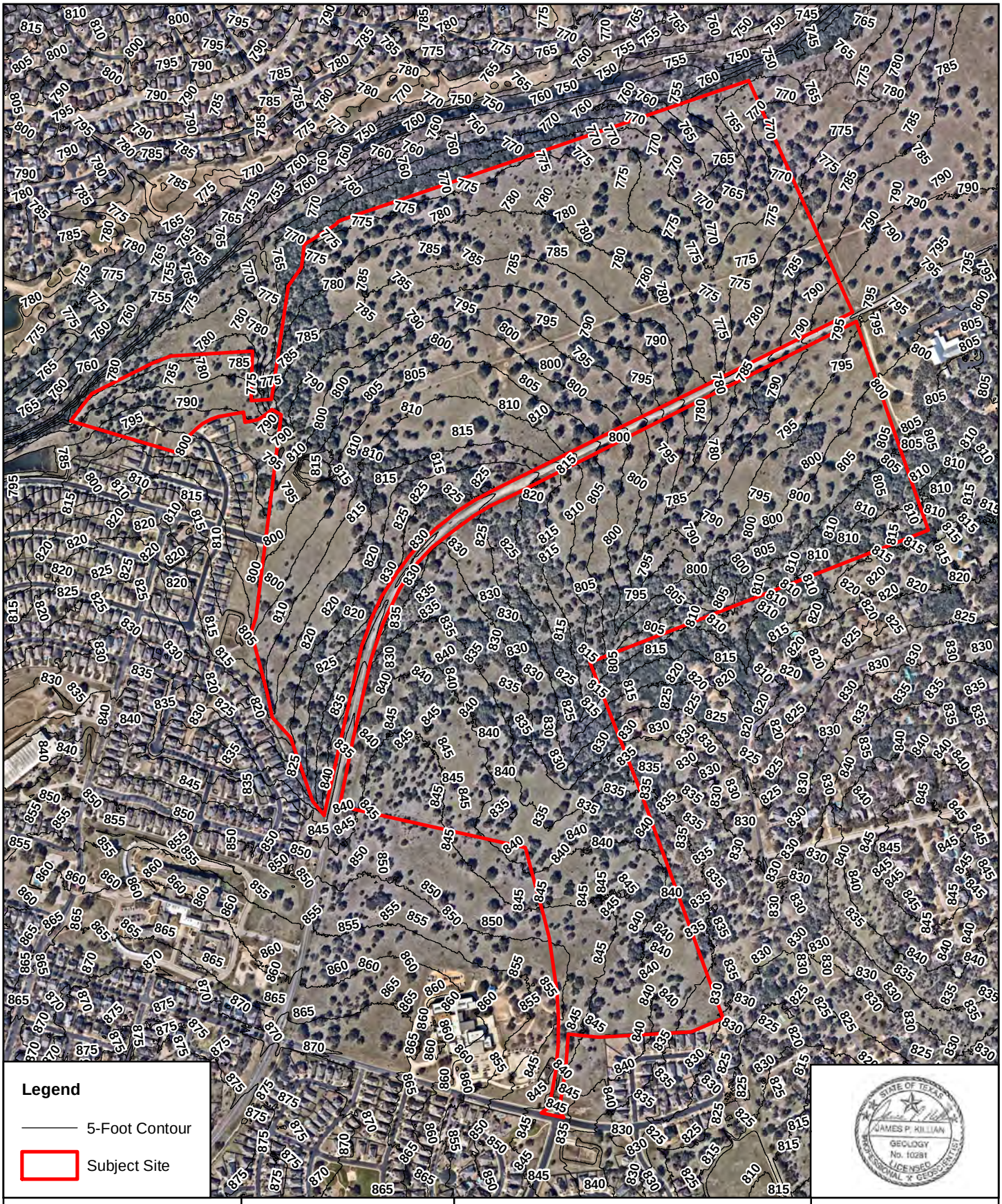

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Horizon
Environmental Services, Inc.

Date:	04/23/2021
Drawn:	KRS
HJN NO:	21081.001 GA
Source:	CAPCOG, 2015; Nearmap, 2021

Attachment F, Figure 3

Site Topography Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

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Feet

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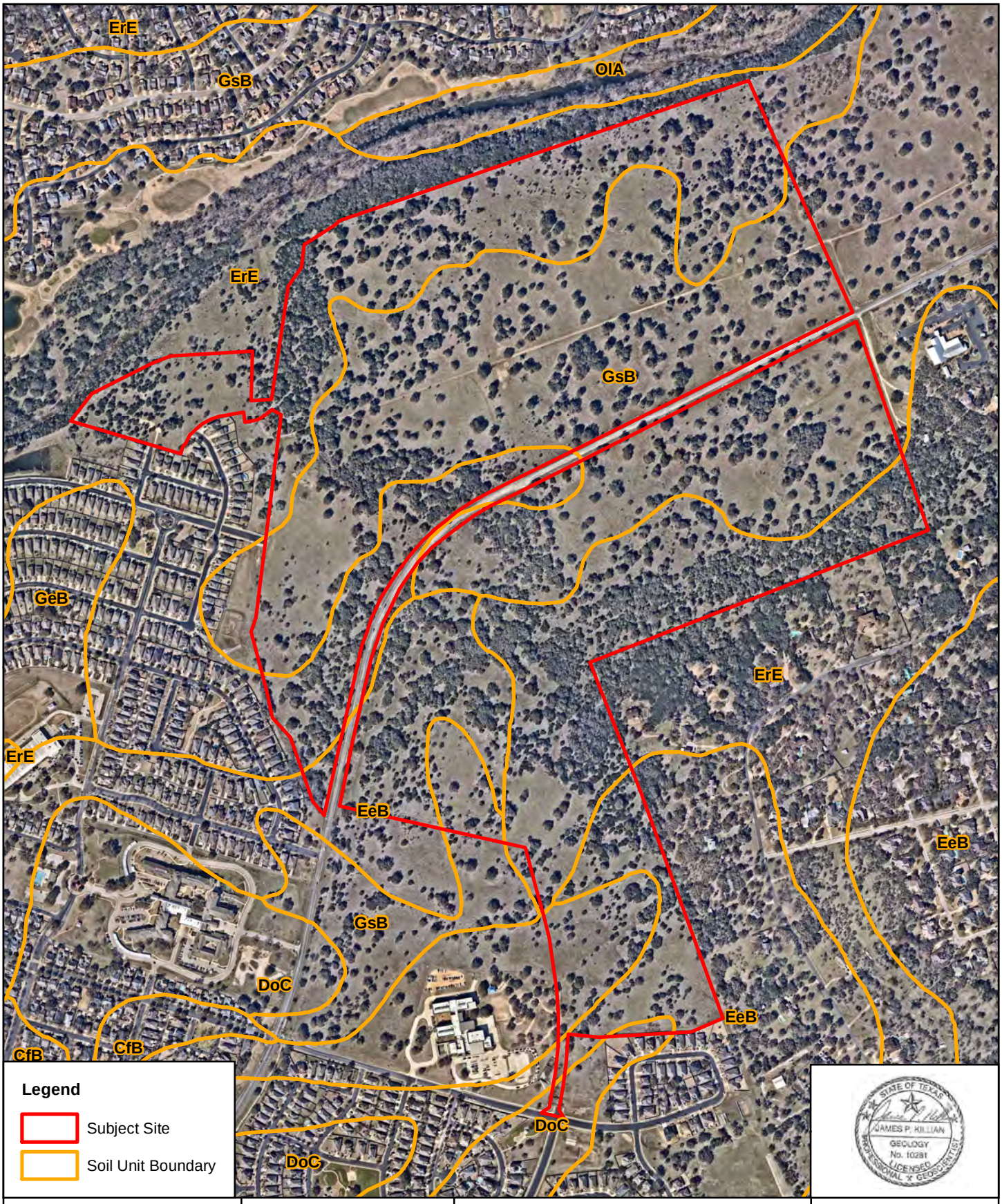

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Date:	04/23/2021
Drawn:	KRS
HJN NO:	21081.001 GA
Source:	Nearmap, 2021; NRCS, 2019

Attachment F, Figure 4

Site Soil Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

N

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Feet

2021\21081--Lennar_Georgetown_Village\Graphics\21081-001GA_04A_Soil.mxd

Legend

- Man-Made Feature
- Non-Sensitive Geologic Feature
- Sensitive Geologic Feature
- Sensitive Cave Feature
- 5-Foot Contour
- Subject Site
- Cave Footprint
- Sinkhole
- TCEQ Buffer Area

Horizon Environmental Services, Inc.

Date:	04/15/2021
Drawn:	KRS
HJN NO:	21081.001 KS
Source:	CAPCOG, 2015; Nearmap, 2021

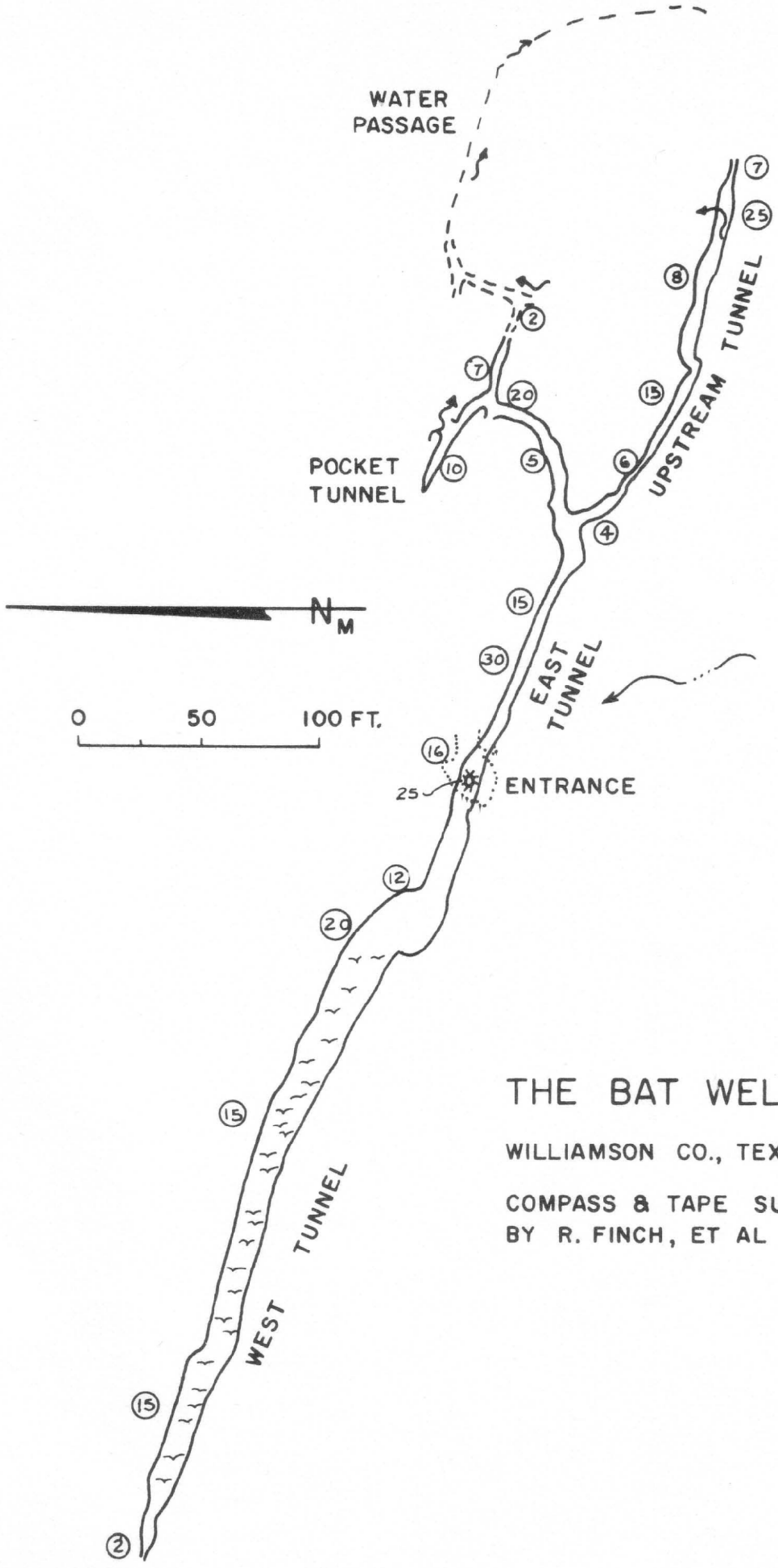
Attachment F, Figure 5

Geologic Feature Buffer Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

STATE OF TEXAS · JAMES P. KILLIAN · GEOLOGY · No. 10291 · LICENSED PROFESSIONAL GEOSCIENTIST

0 200 400
Feet

21081--Lennar_Georgetown_Village\Graphics\21081-001GA_07A_Buffer_DRAFT

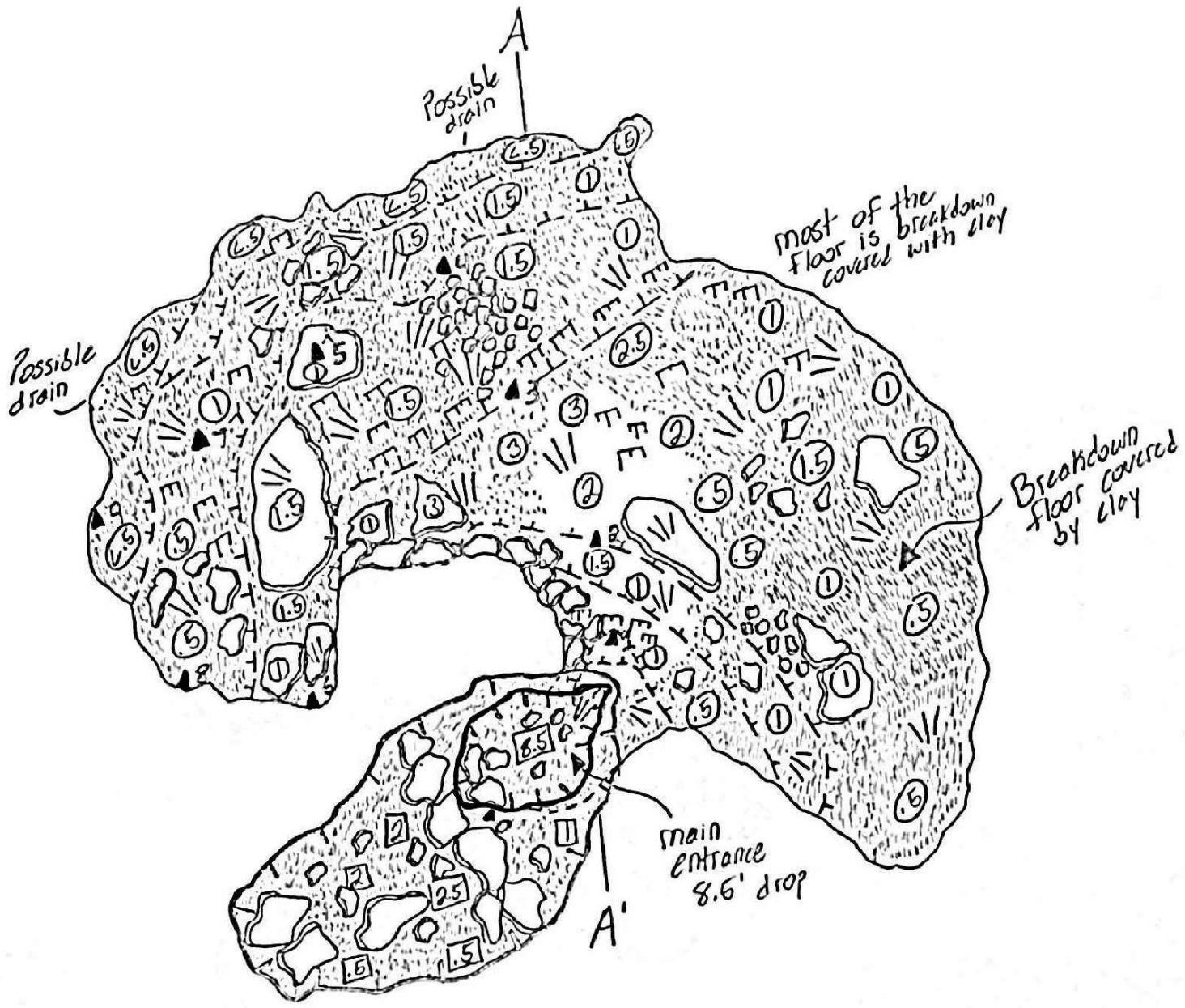


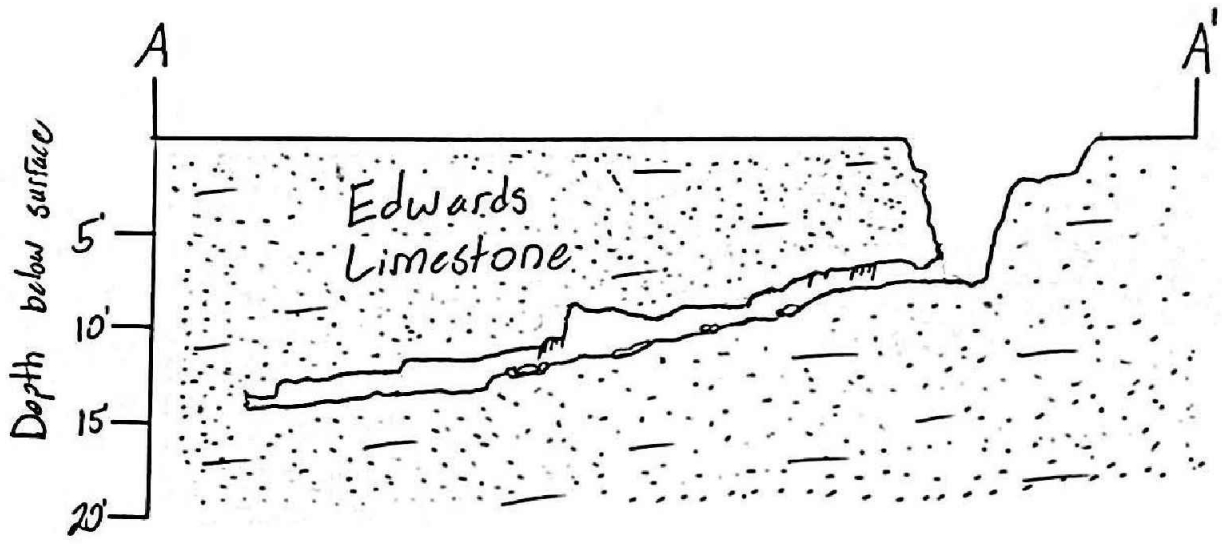
THE BAT WELL

WILLIAMSON CO., TEXAS

COMPASS & TAPE SURVEY
BY R. FINCH, ET AL

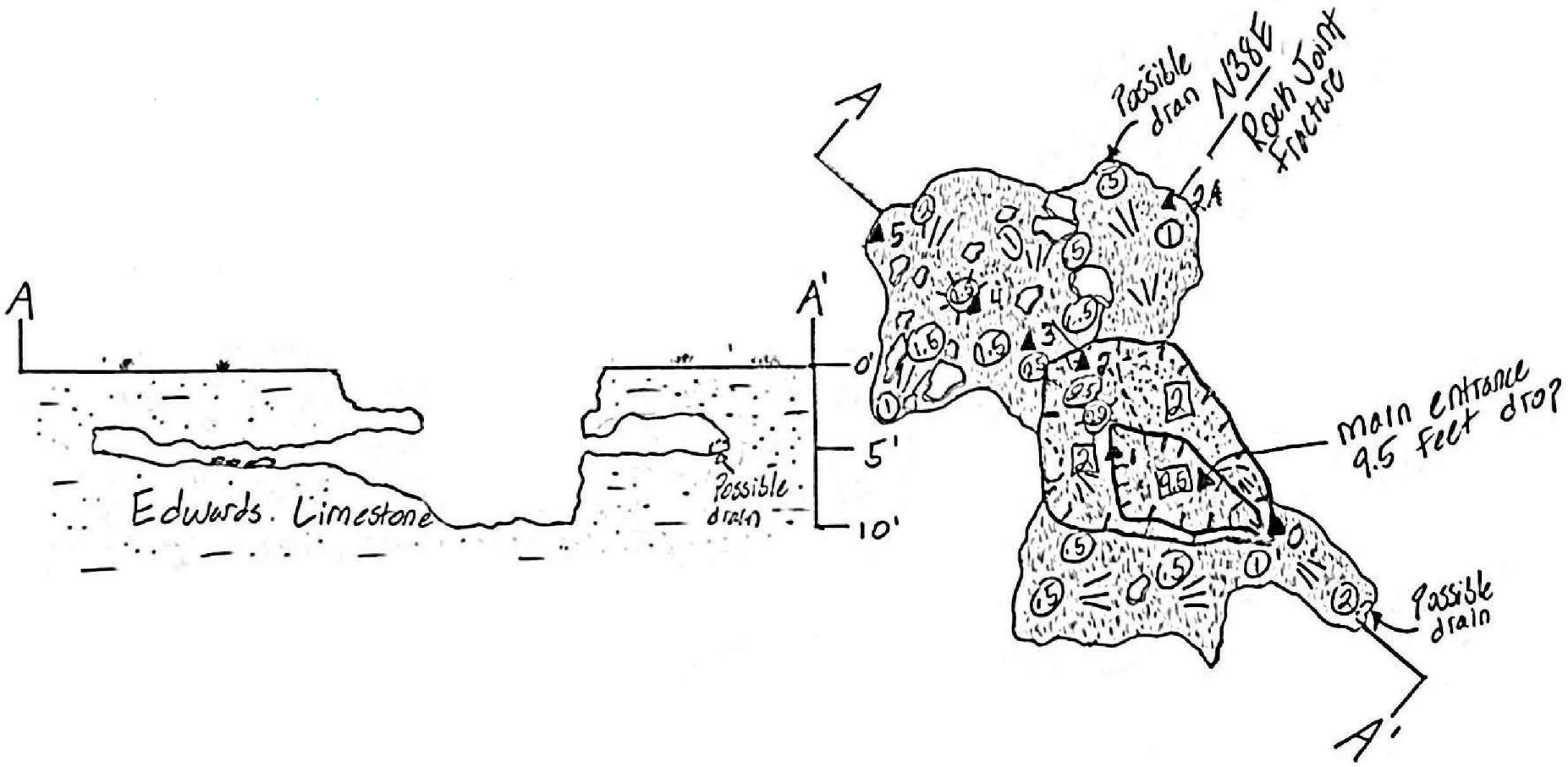

Bat Well Cave KOW Entrance
BatWellCaveKOW3
Bat Well Cave KOW Outline
Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 2,296,583.3333
False Northing: 9,842,500.0000
Central Meridian: -100.3333
Standard Parallel 1: 30.1167
Standard Parallel 2: 31.8833
Latitude Of Origin: 29.6667
Units: Foot US
BAT WELL CAVE
Williamson County, Texas
Compass Sketch
Joel Hunter and Bill Russell
August, 1992
Drafted by Bill Russell
Surface Gully
Entrance
The Bat Well
Drain
Bat Section
Upper Level
The Bat Well
Downstream Water Passage
Stream
Syphon
0 10 20 30 40 Feet
Estimated Feet
Surface Gully
The Bat Well
Logs
Clay
Drain
Projected Profile
Stream
Syphon
Estimated Depth Below Entrance in feet
Estimated Length 1000 feet
Estimated Depth 38 feet





Horizon Environmental Services, Inc.	Date: 06/03/2021 Drawn: KRS HJN NO: 21081.003KS Drafted By:	Diluvio Cave (F-5) Lennar Georgetown Village Georgetown, Williamson County, Texas Suuntos & Laser Survey, 20 May 2021 Personnel: J. Killian, C. Hall, J. Yarbrough & E. Bryant Lenght: 60' Width: 50' Depth: 14' Drafted By: J. Yarbrough	② Ceiling Height (ft) △ Survey Station 1" = 10'	N

21081--Lennar_Georgetown_Village\Graphics\CADD



Horizon Environmental Services, Inc.	Date: 06/03/2021 Drawn: KRS HJN NO: 21081.003KS Drafted By::	Bat Well Sink Cave (F-22) Lennar Georgetown Village Georgetown, Williamson County, Texas Suuntos & Laser Survey, 19 May 2021 Personnel: J. Killian, C. Hall, J. Yarbrough & E. Bryant Lenght: 38' Width: 23' Depth: 9.5' Drafted By: C. Hall	② Ceiling Height (ft) △ Survey Station 1" = 10'

21081--Lennar_Georgetown_Village\Graphics\CADD

Horizon
Environmental Services, Inc.

ATTACHMENT G

SITE PHOTOGRAPHS

Horizon
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PHOTO 1
View of geologic feature F-3 (upland sinkhole) drainage portal, facing northeast

PHOTO 2
View of geologic feature F-5 (sinkhole/Diluvio Cave) prior to excavation in unnamed tributary of Berry Creek, facing northeast

PHOTO 3
View of F-5 after mechanical excavation, facing northwest

PHOTO 4
View of F-5 main cave entrance drop, facing down

Horizon
Environmental Services, Inc.

PHOTO 5
View of F-5 horizontal bedding plane room from survey station no. 2 to station no. 3, facing north

PHOTO 6
View of F-5 bedding plane room from station no. 2, facing east

PHOTO 7
View of F-5 from station no. 5 into the lowest portion of the room near station no. 7, facing northwest

PHOTO 8
View of geologic feature F-21 (upland sinkhole), facing down

Horizon
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PHOTO 9
View of geologic feature F-22 (sinkhole/Bat Well Sink Cave) before mechanical excavation, facing north

PHOTO 10
View of feature F-22 after mechanical excavation, facing north

PHOTO 11
View of F-22 cave entrance drop, facing down

PHOTO 12
Interior view of F-22 low (<2 feet high) horizontal bedding plane room going toward the back drain, facing northwest

Horizon
Environmental Services, Inc.

PHOTO 13
View of geologic feature F-23 (solution cavity), facing west

PHOTO 14
View of F-23 after mechanical excavation, facing northeast

PHOTO 15
View of F-23 bedrock floor, facing down

PHOTO 16
View of geologic feature F-24 (small upland sinkhole), facing northeast

Horizon
Environmental Services, Inc.

PHOTO 17
View of F-24 after mechanical excavation, facing northwest

PHOTO 18
View of geologic feature F-25 (upland sinkhole/solution enlarged fracture trending N40E), facing northeast

PHOTO 19
View of geologic feature F-26 (sinkhole/solution cavity), facing north

PHOTO 20
View of geologic feature F-27 (BatWell Cave) gated entrance, facing northwest

Horizon
Environmental Services, Inc.

PHOTO 21
View of F-27 (BatWell Cave) entrance with initial drop, facing northwest

PHOTO 22
View of geologic feature F-28 (sinkhole/solution cavity), facing northwest

PHOTO 23
View of F-28 after mechanical excavation, facing northwest

PHOTO 24
View of geologic feature F-29 (solution cavity), facing south

Horizon
Environmental Services, Inc.

PHOTO 25
View of F-29 after mechanical excavation, facing northeast

PHOTO 26
View of geologic feature F-30 (solution cavity), facing down

PHOTO 27
View of F-30 after mechanical excavation, facing south

PHOTO 28
View of man-made feature M-1 (man-made stock pond), facing southwest

Horizon
Environmental Services, Inc.

ATTACHMENT H

CAMBRIAN PHASE II KARST INVESTIGATIONS REPORT

RESULTS OF PHASE 2 KARST INVESTIGATIONS AT THE GEORGETOWN VILLAGE, GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Prepared for

Trio Development
7811 Ranch Road 2338
Georgetown, Texas 78633

Prepared by

CAMBRIAN ENVIRONMENTAL
4422 Pack Saddle Pass, Suite 204
Austin, Texas 78745
www.cambrianenvironmental.com
Geoscience Firm Registration No. 50484
U.S. Fish and Wildlife Permit # TE37416B-0

15 August 2017

As a licensed professional geoscientist I attest that the contents of this report are complete and accurate to the best of my knowledge.

Kemble White Ph.D., P.G.
Cambrian Environmental
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RESULTS OF PHASE 2 KARST INVESTIGATIONS AT THE GEORGETOWN VILLAGE, GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Between the 18th of June and the 10th of August 2017 Cambrian Environmental personnel conducted a phase 2 investigation of previously documented potential karst features located on land proposed for future expansion of the Georgetown Village residential development in Georgetown, Texas. Phase 2 investigations involved excavation and exploration of known and suspected karst features identified in a site investigation conducted by Horizon Environmental Services earlier in 2017. Twenty-three features were investigated including 21 features identified by Horizon and two features identified by Cambrian adjacent to features identified by Horizon (identified herein as features F-1.5 and F-6.5). Four features were determined to be non-karst and non-sensitive with respect to aquifer recharge and karst ecology (F-3, F-11, F-14, and F-16). Nine features were determined to be caves of various size (F-1, F-2, F-6, F-8, F-9, F-10, F-13, F-17, and F-19). These features are sensitive with respect to aquifer recharge and are recommended for further study for endangered karst invertebrates (Phase 3 investigation). The most notable features by far are the caves F-1 and F-19. The remaining features (F-1.5 F-4, F-5, F6.5, F-7, F-12 a, F-12-b, F-15, F-18, and F-20) were determined to be karst features too small for human entry. They are sensitive with respect to aquifer recharge but show limited potential for endangered karst invertebrate habitat. Some of these are solution cavities that are suitable for further investigation by bait trapping.

Table 1. Summary of excavation results.

Feature	Type	Progress	Next Step
F1	**Cave (150’ x 250’)**	Excavation complete	Biological Survey
F1.5	Solution Cavity	Excavation complete	Bait Trap
F2	**Cave (15' in diameter)**	Excavation complete	Biological survey
F3	Non-sensitive	Excavation complete	None
F4	Solution Cavity	Excavation complete	Bait Trap
F5	Solution Cavity	Excavation complete	Bait Trap
F6	**Cave (25' in diameter)**	Excavation complete	Biological survey
F6.5	Solution Cavity	Excavation complete	Bait Trap
F7	Solution Cavity	Excavation complete	Bait Trap
F8	**Cave (10’ in diameter)**	Excavation complete	Biological Survey
F9	**Cave (12’ in diameter)**	Excavation complete	Biological survey
F10	**Cave (10’ x 20’ diam.)**	Excavation complete	Biological survey
F11	Non-sensitive	Excavation complete	None
F12a	Solution Cavity	Excavation complete	Bait Trap
F12b	Solution Cavity	Excavation complete	Bait Trap
F13	**Small Cave**	Excavation complete	Bait Trap
F14	Non-sensitive	Excavation complete	None
F15	Solution Cavity	Excavation complete	Bait Trap
F16	Non-sensitive	Excavation complete	None
F17	**Cave (25' in diameter)**	Excavation complete	Biological survey
F18	Solution Cavity	Excavation complete	None, minor recharge feature
F19	**Cave (40' in diameter)**	Excavation complete	Biological Survey
F20	Solution Cavity	Excavation Complete	Bait Trap

Feature-by-feature Excavation Results

F-1 Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole measuring approximately 20 feet in diameter by 1.5 feet deep with a central drainage portal area measuring approximately 6 feet long by 3 feet wide by 3 feet deep (Photo 1). Moderate to high air flow was observed at all drainage openings. Preliminary hand excavation revealed loose rocks and cobbles approximately 4 feet below the surface with additional void space of unknown extent.

Cambrian personnel conducted backhoe and hand excavation in the feature (Photo 2). During the excavation process, signs of airflow and channelized recharge of water were detected. Fill material predominantly consisted of large limestone boulders, cobbles, and dark brown clayey soil. Excavation ceased when the feature became accessible for human entry. Excavation of this feature confirmed that it is karst in origin. The feature is a fracture-controlled cave with the entrance passage formed primarily along a trend of N55°W. The cave entrance occurs beneath the north rim of the excavation pit approximately 4.5 feet below the surface. The cave consist of three basic elements; a series of stair-stepping passages trending downward to the east from the entrance (Photos 3 through 5) followed by a low, wide bedding plane passage which extends to the north and east (Photo 6), and an additional series of passages extending to the northeast at slightly higher elevation leading to a gallery of speleothems with pools of water (Photos 7 and 8). The speleothems and water indicate that some sort of recharge feature exists at the surface approximately 220 feet northeast of the entrance. A drainage channel is carved into the soil floor of the cave (Photo 6) extending from the vicinity of the entrance eastward to a cluster of drainage portals in the floor of the eastern end of the cave. The cave reaches its maximum humanly-passible depth in this area at approximately 18 feet below the surface. The presence of the drainage channel confirms the significance of the cave as an aquifer recharge feature. The overall footprint of the cave measures approximately 250 feet from west to east and approximately 170 feet from north to south (Figure 1). The feature contains significant habitat potential for endangered karst invertebrates. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 1. Feature F-1 prior to excavation.

Photo 2. Feature F-1 during backhoe and hand excavation (facing north rim of cave entrance).

Photo 3. Talus pile at entrance of F-1 with daylight in the background from excavation pit.

Photo 4. Fracture-controlled entrance passage heading east from the entrance of F-1.

Photo 5. Westward view toward entrance passage from lower room of F-1.

Photo 6. Drainage channel in soil floor in lower room of F-1.

Photo 7. Speleothems in northern end of F-1 indicating a recharge pathway from the surface.

Photo 8. Speleothem gallery and pool of water at northeastern extent of F-1.

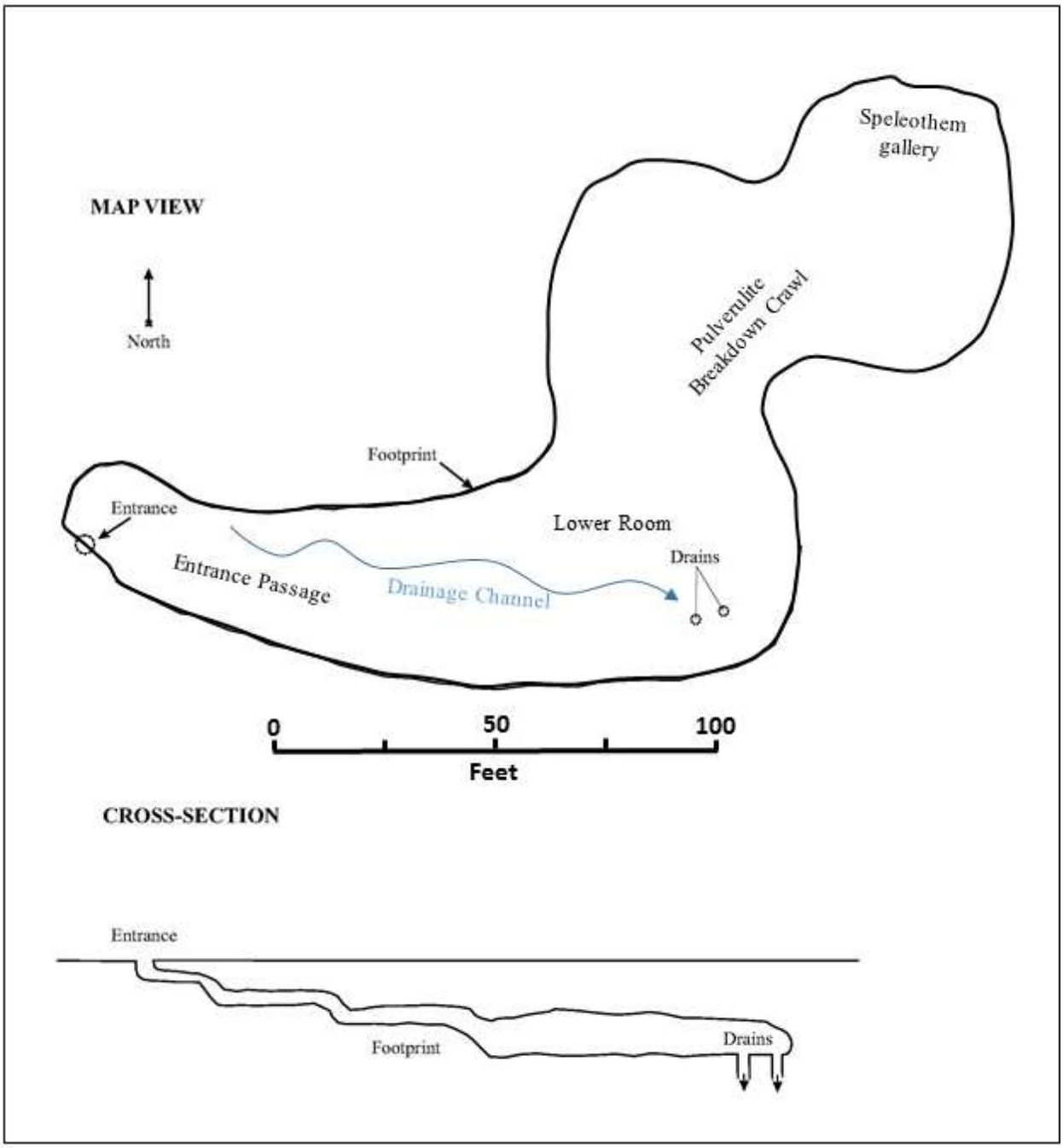


Figure 1. Map view and cross-section of Feature F-1.

F-1.5 Solution Cavity **Presence/Absence Investigation Recommended**

An additional feature occurring approximately 95 feet southwest of F-1 was identified by Cambrian Environmental on 21 July 2017 when the backhoe ran over it. Surface expression of the feature prior to excavation measured approximately 1 foot in diameter by 8 inches deep (Photo 9). Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. During the excavation process, signs of airflow were detected. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity measuring approximately 1 foot long by 3.5 feet wide by 2.5 feet deep horizontally and is likely an extension of Feature F-1 (Photo 10). Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 9. Feature F-1.5 prior to Cambrian excavation.

Photo 10. Feature F-1.5 following backhoe and hand excavation.

F-2 Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 10 feet in diameter by 1 foot deep with several small drainage portal openings. Preliminary hand excavation produced a central drainage portal area measuring approximately 2 feet in diameter by 3 feet deep with a bedrock headwall about 4 feet below the surface with additional void space and high air flow conductivity (Photo 11). The feature was classified as a potential cave.

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of limestone cobbles and boulders and dark clayey soil. During the excavation process, signs of airflow and channelized recharge of water were detected. Excavation ceased when the feature became accessible for human entry (Photos 12 through 14). Excavation of this feature confirmed that it is karst in origin. The feature is a cave that contains significant habitat potential for endangered karst invertebrates. The entrance of the feature measures approximately 2 feet long by 1.5 feet wide by 4 feet deep and the footprint is approximately 15 feet in diameter extending to the east of the entrance (Figure 2). Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 11. Feature F-2 prior to Cambrian excavation.

Photos 12, 13, and 14. Feature F-2 during and after to Cambrian excavation.

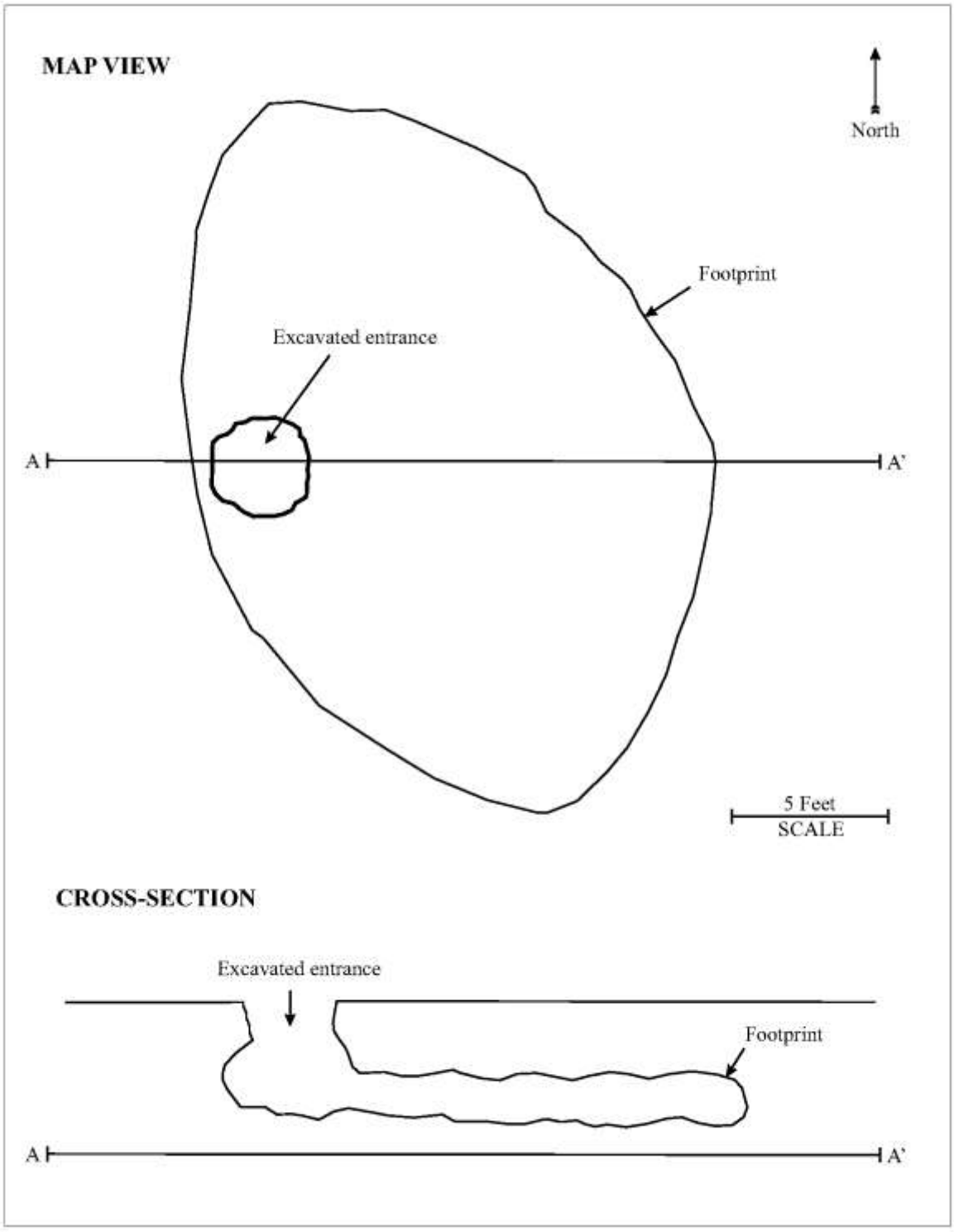


Figure 2. Map view and cross-section of Feature F-2.

F-3 Non-karst Closed Depression No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 10 feet in diameter by 1 foot deep with several small (<2 in) semi-open drainage portals containing fill material of loose to firm clayey soil and small rocks and cobbles (Photo 15).

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. The excavated area measures approximately 7 feet long by 4 feet wide by 4.5 feet deep, and fill material consisted of dark to brown clayey soil with interspersed limestone cobbles. Excavation ceased when a bedrock surface was exposed (Photo 16 and 17). Excavation of this feature confirmed that it is non-karst in origin. During the excavation process, no signs of airflow or channelized recharge of water were detected, nor does the feature appear to have formed by soil or bedrock collapse. **No Habitat Potential.**

Photo 15. Feature F-3 prior to Cambrian excavation.

Photo 16. Feature F-3 during Cambrian backhoe excavation.

Photo 17. Feature F-3 after Cambrian backhoe and hand excavation.

F-4 Solution Cavity Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a solution cavity measuring approximately 3 feet long by 2 feet wide by 4.5 feet deep with loose soil and rock infilling (Photo 18). Moderate air flow conductivity was observed.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. The excavated solution cavity measures approximately 2 feet long by 1 foot wide by 3 feet deep, and the fill material consisted of brown clayey soil and organics with interspersed limestone cobbles. The feature seems to continue into the subsurface but further excavation was not practical with the backhoe (Photos 19 through 21). Excavation of this feature confirmed that it is karst in origin. The feature parallels a lineation (trending roughly N40°E) in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-5, F-8, F-10, and F-17 are likely associated with the same fault. Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 18. Feature F-4 prior to Cambrian excavation.

Photo 19. Feature F-4 during Cambrian backhoe excavation.

Photo 20. Feature F-4 prior to Cambrian excavation.

Photo 21. Feature F-4 after Cambrian backhoe and hand excavation.

F-5 Solution Cavity Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole in an unnamed tributary of Berry Creek measuring approximately 20 feet long by 15 feet wide by 3 feet deep with several small drainage portal openings among rocks and cobbles in the center and high air flow conductivity (Photo 22). Preliminary excavation and probing revealed a depth of approximately 4 feet. The feature was classified as a potential cave. The feature is a significant recharge feature being located in the bed of a drainage channel.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. The excavated drainage area is triangular and measures approximately 3.5 feet long by 3.5 feet wide by 4 feet deep, and the fill material consisted of dark to brown clayey soil with limestone cobbles (Photo 23). Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity that extends horizontally along a bedding plane to the northwest and to the southeast but is not humanly passable in either direction (Photo 24 and 25, Figure 3). The feature parallels a lineation (trending roughly N40°E) in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-4, F-8, F-10, and F-17 are likely associated with the same fault. Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 22. Feature F-5 prior to Cambrian excavation.

Photo 23. Feature F-5 after Cambrian backhoe excavation.

Photo 24. Feature F-5 during Cambrian hand excavation.

Photo 25. Feature F-5 after Cambrian backhoe and hand excavation.

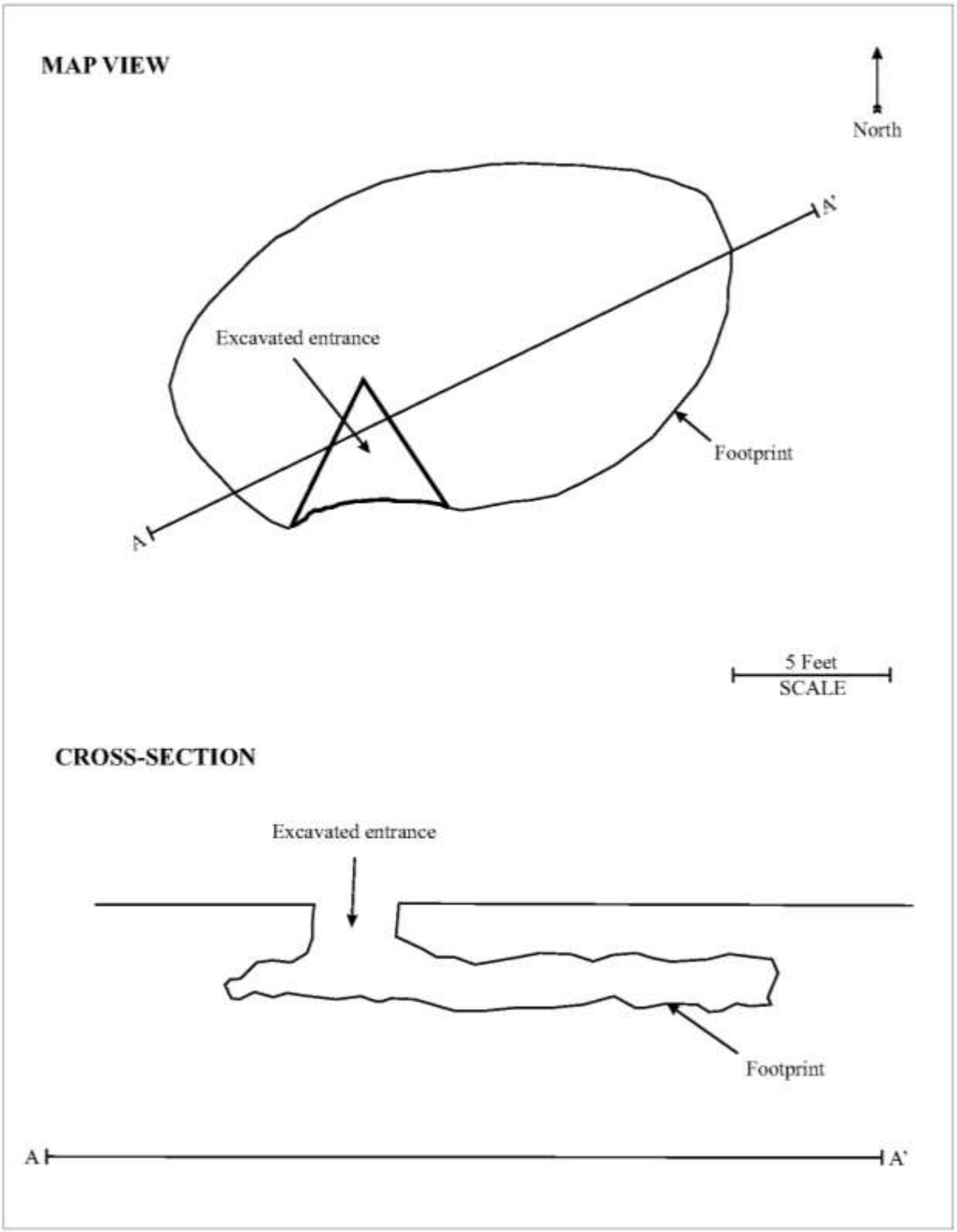


Figure 3. Map view and cross-section of Feature F-5.

F-6 Cave **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole located in an open area measuring approximately 35 feet long by 30 feet wide by 5 feet deep with numerous drainage portals of various sizes located throughout the rock debris (Photo 26). Slight to moderate air flow was noted at the openings. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. The excavated backhoe area is approximately 14.5 feet long by 12.5 feet wide by 12 feet deep. Fill material consisted of large limestone boulders and cobbles and dark clayey soil. During the excavation process, signs of airflow and channelized recharge of water were detected. Excavation ceased when the feature became accessible for human entry (Photo 27 through 29, Figure 4). Excavation of this feature confirmed that it is karst in origin. The feature is a cave consisting of a single room formed along the same bedding plane approximately 10 feet below the surface. The room measures approximately 25 feet across from east-west by 17.5 feet across north-south, by 12-18 inches in height. The room drains to the east through a humanly-impassible constriction in the wall and contains significant habitat potential for endangered karst invertebrates. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 26. Feature F-6 prior to Cambrian excavation.

Photo 27. Feature F-6 during to Cambrian backhoe excavation.

Photo 28. Feature F-6 during Cambrian hand excavation.

Photo 29. Feature F-6 after Cambrian backhoe and hand excavation.

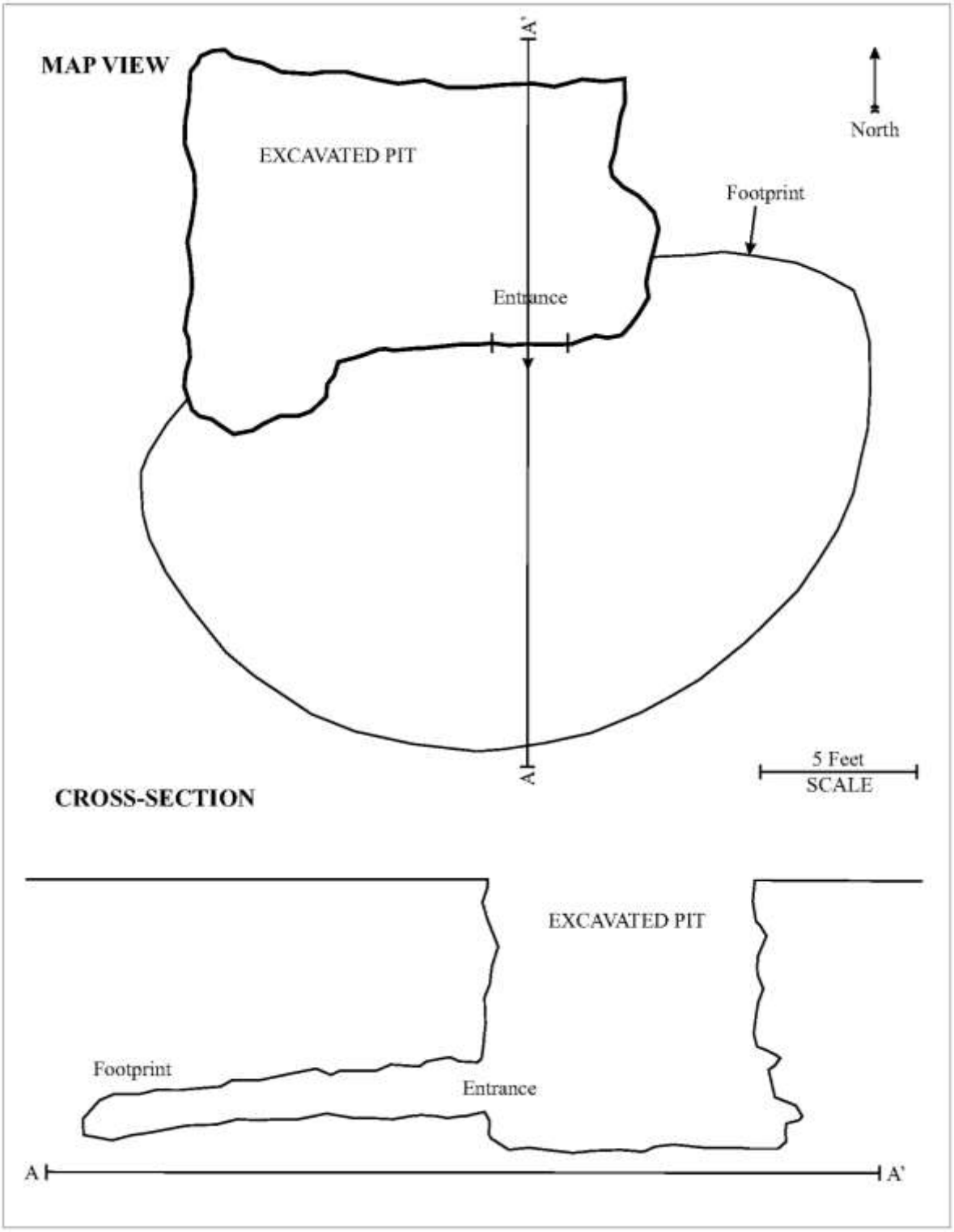


Figure 4. Map view and cross-section of Feature F-6.

F-6.5 Solution Cavity **Presence/Absence Investigation Recommended**

An additional feature was identified Cambrian Environmental on 24 May 2017 (Photo 30). Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity measuring approximately 1.5 feet long horizontally by 8 inches tall by 0.5+ feet deep and fill material consisted of dark to light brown clayey soil with limestone cobbles (Photos 31 and 32). The solution cavity is formed along a prominent bedrock fracture (trending N10°W) of tectonic origin which seems to be structurally related to feature F-6. Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 30. Feature F-6.5 prior to Cambrian excavation.

Photo 31. Feature F-6.5 during Cambrian backhoe excavation.

Photo 32. Feature F-6.5 after Cambrian backhoe and hand excavation.

F-7 Solution Cavity Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a small upland sinkhole measuring approximately 7 feet in diameter by 1 foot deep with an open drainage portal about 0.5 feet in diameter by 1 foot deep near the center (Photo 33). Slight air flow was noted at the opening. Preliminary hand excavation revealed a solution-enlarged fracture approximately 3 feet below the surface measuring 2.5 feet long by 1 foot wide by 5.5 feet deep (azimuth: N30°W).

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. Fill material consisted of organics and brown clayey soil. Excavation of this feature confirmed that it is karst in origin. An open solution cavity was encountered about 6 inches below the surface, measuring approximately 2 feet long by 1.5 feet wide by at least 5.5 feet deep (Photo 34 and 35). Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 33. Feature F-7 prior to Cambrian excavation.

Photo 34. Feature F-7 during Cambrian backhoe excavation.

Photo 35. Feature F-7 after Cambrian backhoe and hand excavation.

F-8 Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 12 feet long by 10 feet wide by 2.5 feet deep that funnels into a semi-open area about 3 feet long by 1.5 feet wide by 3.5 feet deep that contains several drainage portal openings of various sizes (Photo 36). The feature was presumed to be associated with previous land disturbance including chaining and bulldozing. Preliminary hand excavation and probing reveled loose small rocks and cobbles approximately 4 feet below the surface with slight to moderate air flow. The feature was classified as a potential cave.

Excavation by hand followed by backhoe revealed a collapse sinkhole measuring approximately 12 feet long by 5 feet wide by 4 feet deep (Photo 37). Small extents of cave passage extend from the collapse to the northeast for approximately 10 feet (Photos 38 and 39). The sinkhole is elongated along a fracture trending roughly N40°E, which parallels a lineation in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-4, F-5, F-17, and F-10 are likely associated with the same fault. Biological surveys from the entrance will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 36. Feature F-8 prior to Cambrian excavation.

Photo 37. Excavation of Feature F-8.

Photo 38. Bedding plane void which drains the sinkhole to the southeast.

Photo 39. Bedding plane void which drains the sinkhole to the southeast.

F-9 Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 20 feet long by 15 feet wide by 2.5 feet deep (Photo 40). The feature appeared to have been partially filled with large rocks and/or soil debris from previous land disturbance activities including chaining and bulldozing. Several drainage portal openings of various sizes were noted among the fill material with slight to moderate air flow. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. Fill material consisted of large limestone boulders and cobbles, organics, dark brown clayey soil to light brown soil (Photo 41). Signs of airflow and channelized recharge of water were detected. Excavation ceased when the feature became accessible for human entry (Photo 42). Excavation of this feature confirmed that it is karst in origin. The feature is a small cave measuring approximately 15 feet in diameter extending to the south from the entrance (Figure 5). It contains habitat potential for endangered karst invertebrates. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 40. Feature F-9 prior to Cambrian excavation.

Photo 41. Feature F-9 during Cambrian backhoe excavation.

Photo 42. Feature F-9 after Cambrian backhoe and hand excavation.

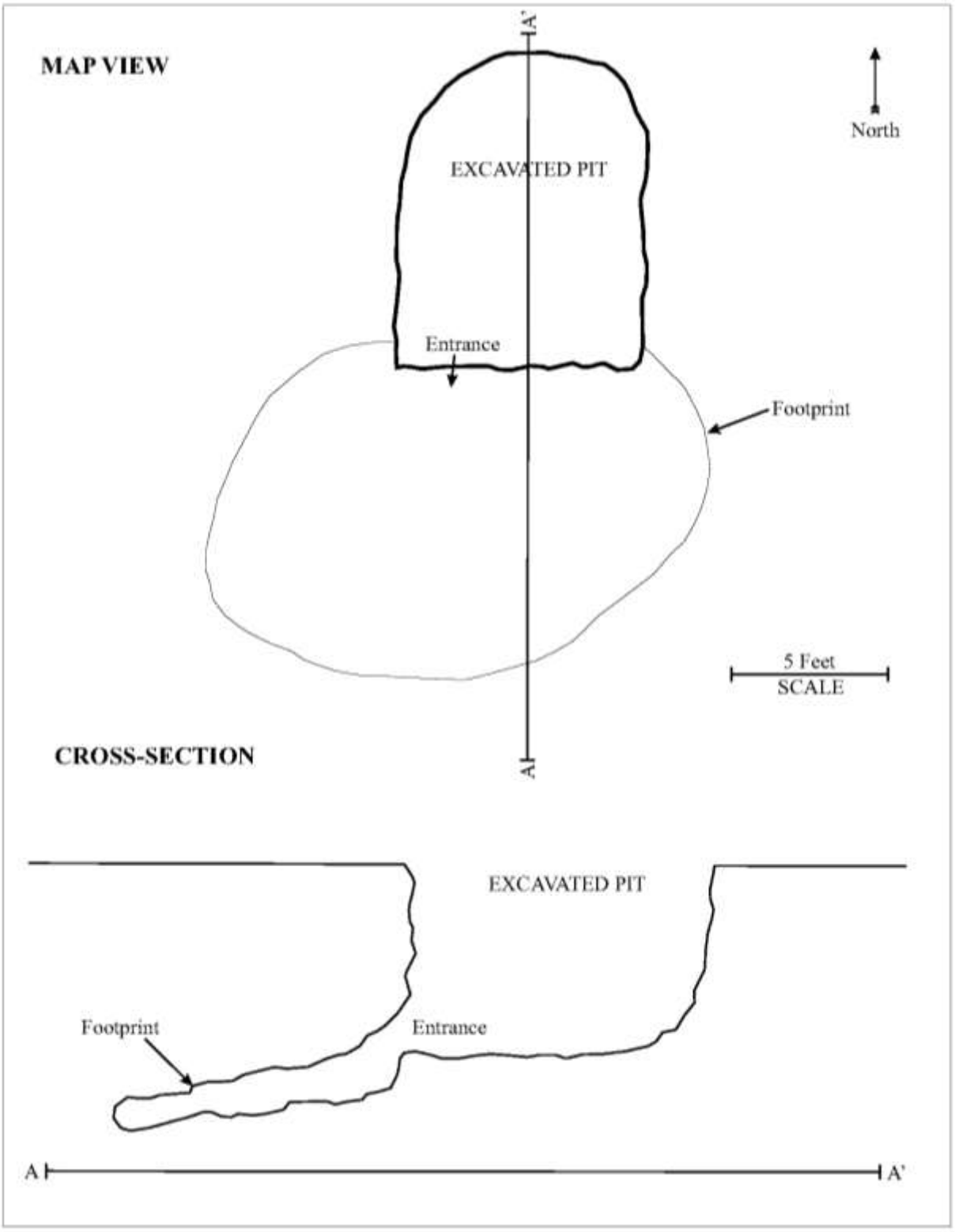


Figure 5. Map view and cross-section of Feature F-9.

F-10 Cave **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole measuring approximately 35 feet long by 25 feet wide by 7.5 feet deep with an exposed vertical rock headwall along the west side of the sink (Photo 43). Several hackberry trees were observed growing inside the feature. An open drainage portal approximately 2.5 feet long by 1.5 feet wide by 2 feet deep exists along the southwest corner of the sink floor adjacent to the headwall and moderate airflow was noted at the opening. Within the opening, a larger void passage measuring 35 feet long by 10 to 12 feet wide by 3 to 8 feet high. Additional drainage points and cave biota (cave crickets and tricolored bats) were observed within the void passage. The feature was determined to be a cave.

Cambrian personnel conducted minor hand excavation in the feature. Signs of airflow and channelized recharge of water were detected. The feature is a cave measuring approximately 25 feet long and 10 feet wide extending from the sinkhole rim to the southwest (Photo 44, Figure 6). The feature parallels a lineation (trending roughly N40°E) in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-4, F-5, F-8, and F-17 are likely associated with the same fault. The feature contains habitat potential for endangered karst invertebrates. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 43. View of Feature F-10 from surface.

Photo 44. View of entrance into Feature F-10.

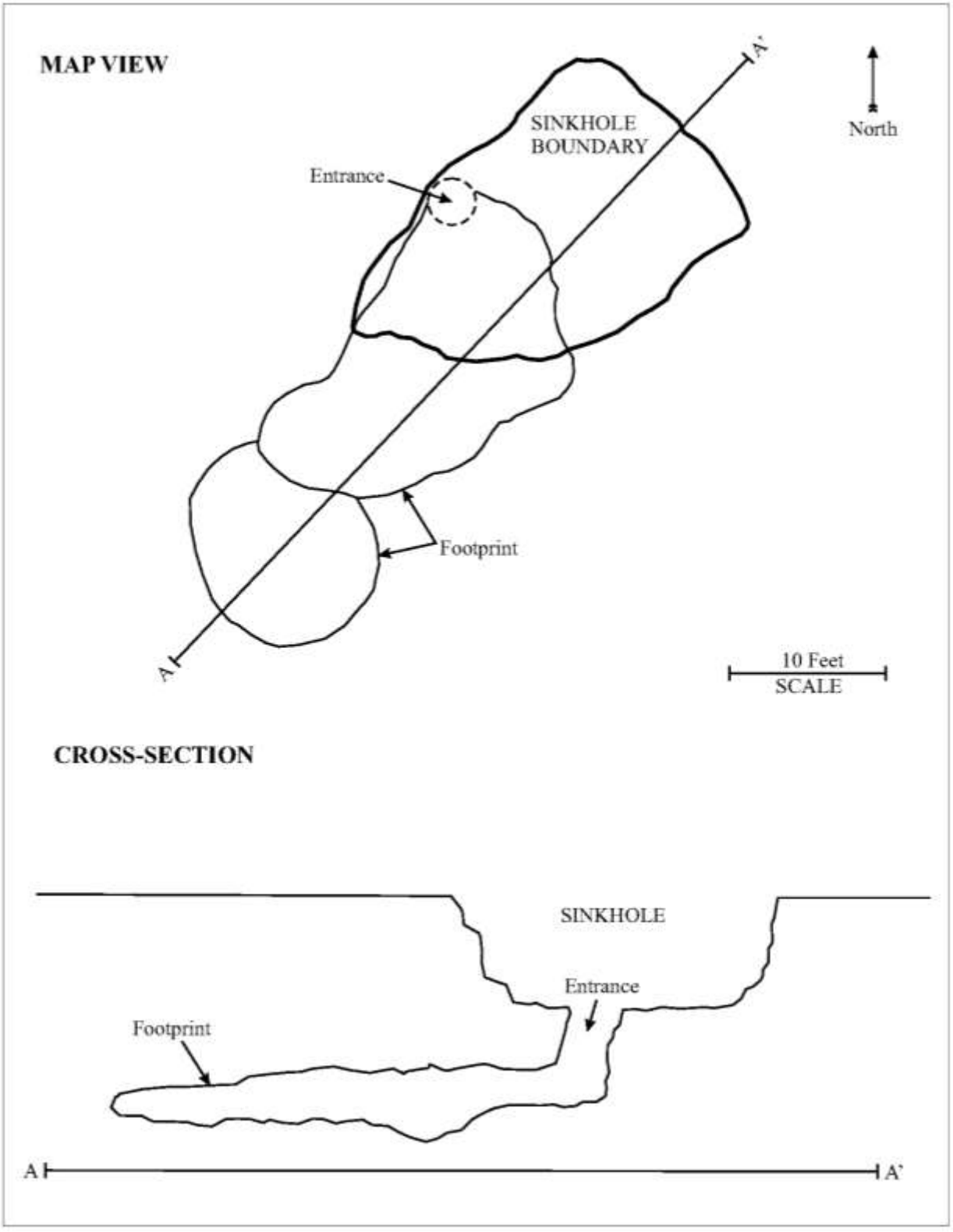


Figure 6. Map view and cross-section of Feature F-10.

F-11 Non-karst Feature No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as a potential upland sinkhole measuring approximately 20 feet in diameter by 1.5 feet deep with several thin, flat rocks and soil debris placed into the feature (Photo 45). No airflow or drainage portals were observed.

Cambrian personnel conducted hand excavated in the feature by removing limestone rocks and cobbles. Excavation of this feature confirmed that it is non-karst in origin. During the excavation process, no signs of airflow or channelized recharge of water were detected, nor does the feature appear to have formed by soil or bedrock collapse (Photo 46). The feature was determined to be a push pile related to previous land clearing activities. **No Habitat Potential.**

Photo 45. Feature F-11 prior to excavation.

Photo 46. Feature F-11 following Cambrian excavation.

F-12a Solution Cavity **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 8 feet in diameter by 1.5 feet deep with numerous small drainage portals and high air flow conductivity at the openings. Preliminary hand excavation revealed a solution cavity measuring approximately 4.5 feet long by 2 feet wide by 4 feet deep, with small drainage portal openings along two sides (Photo 47). The feature was classified as a potential cave.

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of organics and brown clayey soil. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity measuring approximately 3.5 feet long by 2.5 feet wide by 3.5 feet deep. Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 47. View of Feature F-12a.

F-12b Solution Cavity **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as a small, semi-open solution cavity measuring approximately 1 foot long by 0.5 feet wide by 1 foot deep with loose soil and rock infilling (Photo 48). Slight to moderate air flow was noted at the opening.

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of organics and brown clayey soil with interspersed limestone cobbles. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity measuring approximately 8 inches long by 6 inches wide by 1+ foot deep (Photo 49). Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 48. Feature F-12b prior to Cambrian excavation.

Photo 49. Feature F-12b during Cambrian hand excavation.

F-13 Small Cave **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 20 feet long by 6 feet wide by 2 feet deep. Two small, semi-open drainage portals about 12 feet apart among loose to firm clayey soil infilling were noted in the feature (Photos 50 and 51). Slight air flow was observed at the portal openings.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation to the extent practical within the feature. Fill material consisted of large limestone boulders and cobbles, organics, and dark brown clayey soil (Photo 52). Signs of airflow and channelized recharge of water were detected. Approximately 6 cubic yards of material was removed by backhoe. Subsequent hand excavation ceased after Cambrian personnel removed approximately 2 cubic yards of firm clayey soil from the interior (Photo 53 and 54). The feature is karst in origin and is currently classified as a small cave that seems entirely filled with soil. Cambrian personnel will conduct bait trapping in the feature.

Photo 50. Feature F-13 prior to Cambrian excavation.

Photo 51. Feature F-13 prior to Cambrian excavation.

Photo 52. Feature F-13 during Cambrian hand excavation.

Photo 53. Feature F-13 after Cambrian backhoe excavation.

Photo 54. Interior of Feature F-13 after Cambrian backhoe and hand excavation.

F-14 Non-karst Feature No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as a solution-enlarged fracture measuring approximately 3 feet long by 0.5 feet wide by 1.5 feet deep (azimuth: N65°W) with apparent semi-open drainage portals and slight air flow conductivity (Photo 55).

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of organics and brown clayey soil. Excavation of this feature confirmed that it is non-karst in origin. During the excavation process, no signs of airflow or channelized recharge of water were detected, nor does the feature appear to have formed by soil or bedrock collapse (Photo 56). The feature is likely the result of surficial weathering processes and the presence of limestone float slabs. **No Habitat Potential.**

Photo 55. Feature F-14 prior to Cambrian excavation.

Photo 56. Feature F-14 after Cambrian hand excavation.

F-15 Solution Cavity **Presence / Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as a small upland sinkhole measuring approximately 7 feet long by 5 feet wide by 1.5 feet deep that funnels into an open drainage portal about 1 foot long by 0.5 feet wide by 1 foot deep among loose rocks (Photo 57). Preliminary hand excavation enlarged the drainage portal to approximately 2 feet in diameter by 1.5 feet deep with high air flow. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature (Photo 58). Fill material consisted of organics and dark brown clayey soil to light brown soil. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity that extends horizontally beneath a bedding plane for at least 4 feet (Photo 59, Figure 7). Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 57. Feature F-15 prior to Cambrian excavation.

Photo 58. Feature F-15 during Cambrian backhoe excavation.

Photo 59. Feature F-15 after Cambrian backhoe excavation.

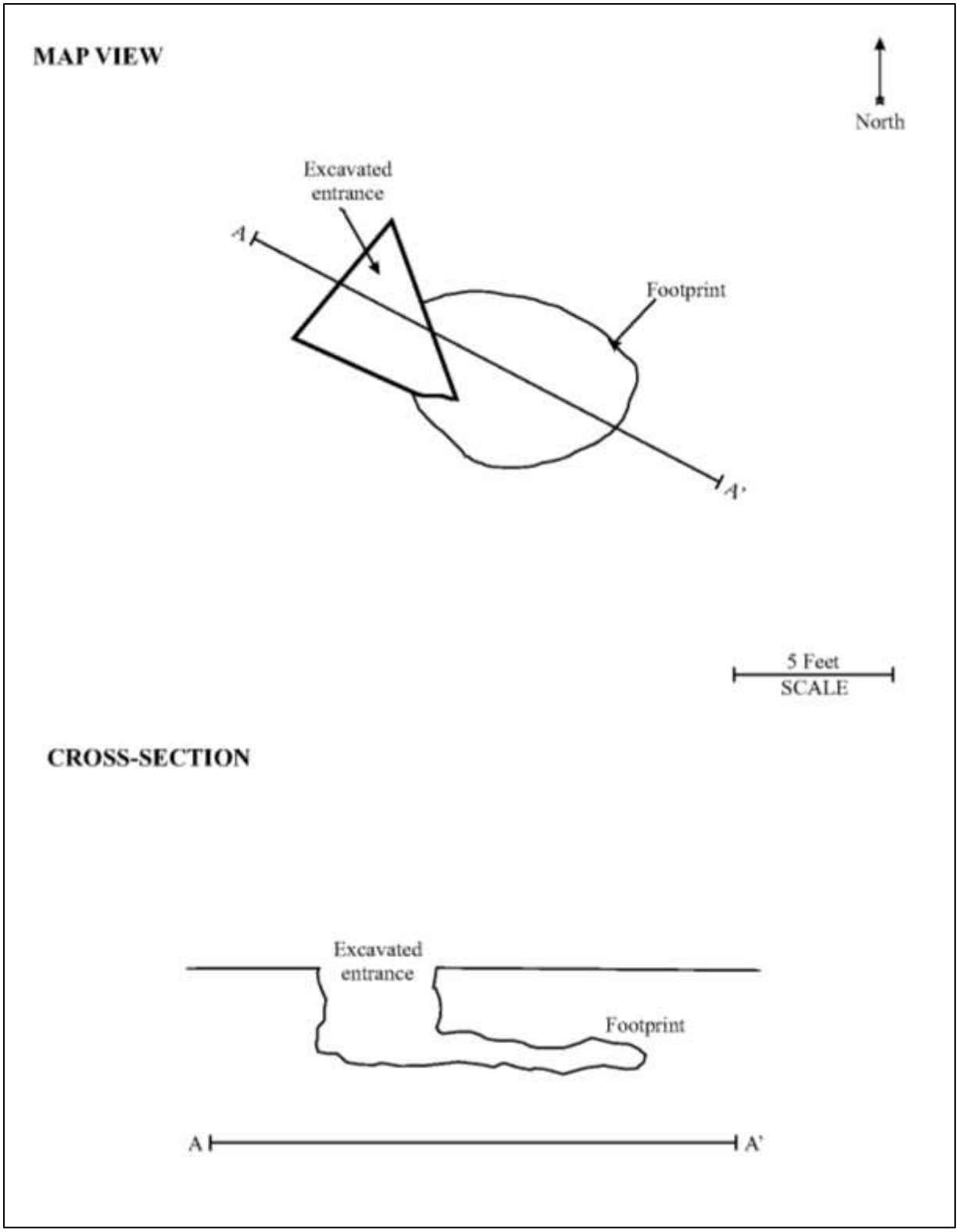


Figure 7. Map view and cross-section of Feature F-15.

F-16 Non-karst Feature No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as a solution cavity measuring approximately 3 feet long by 2 feet wide by 1.5 feet deep with loose soil infilling (Photo 60). The feature undercuts toward the north about 1 foot high and two feet long with apparent burrowing mammal activity. Slight air flow was noted at the opening.

Cambrian personnel conducted hand excavated and subsequent backhoe excavation in the feature. Excavation of this feature confirmed that it is non-karst in origin and appears to be the result of plant root growth and burrowing animals. During the excavation process, no signs of airflow or channelized recharge of water were detected, nor does the feature appear to have formed by soil or bedrock collapse (Photos 61 and 62). Excavation ceased when weathered bedrock was encountered. **No Habitat Potential.**

Photo 60. Feature F-16 prior to Cambrian excavation.

Photo 61. Feature F-16 after Cambrian hand excavation.

Photo 62. Feature F-16 after Cambrian backhoe excavation.

F-17 Cave **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as a small drainage portal opening measuring approximately 0.5 feet in diameter within the top of an underlying solution cavity measuring approximately 5 feet long by 3 feet wide by 3 feet high with dark graying brown soil and rock floor (Photo 63). Moderate to high air flow was noted at the opening. Preliminary hand excavation widened the solution cavity to approximately 2.5 feet long by 1.5 feet wide, revealing a bedding plane void passage extending toward the northwest, east, and southeast. An additional passage was discovered along the southwest side wall. The feature was determined to be a cave.

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of limestone cobbles. Signs of airflow and channelized recharge of water were detected. Excavation ceased when the feature became accessible for human entry (Photos 64 and 65). Excavation of this feature confirmed that it is a cave that contains habitat potential. Entrance to the feature measures approximately 2 feet long by 2.5 feet wide through which the floor can be seen approximately by 4.75 feet below. The cave consists of two low, wide rooms stretching in succession to the south for a total distance of approximately 25 feet (Figure 8). The feature parallels a lineation (trending roughly N40°E) in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-4, F-5, F-8, and F-10 are likely associated with the same fault. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 63. Feature F-17 prior to Cambrian excavation.

Photo 64. Feature F-17 after Cambrian hand excavation.

Photo 65. Interior view of Feature F-17 after Cambrian hand excavation.

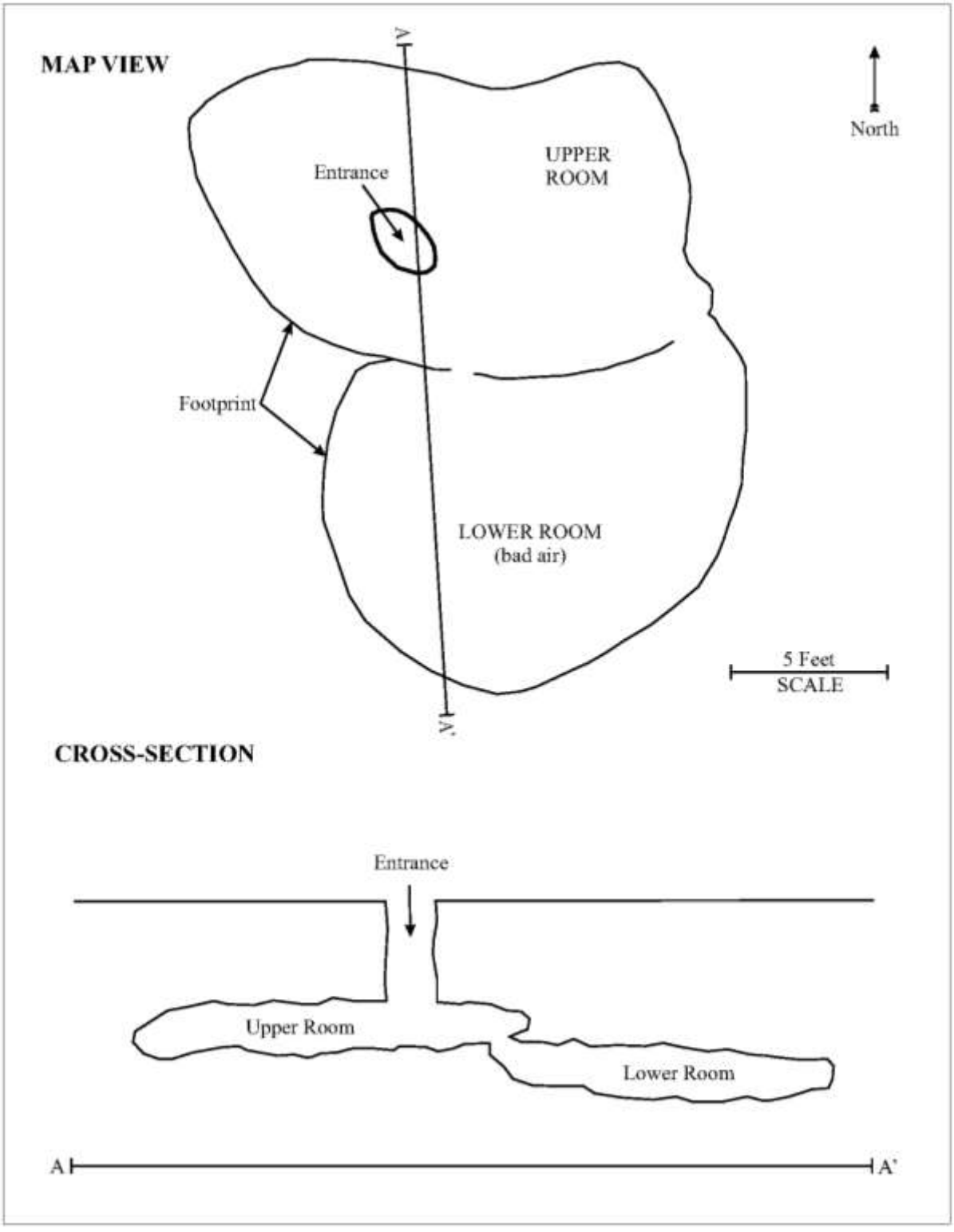


Figure 8. Map view and cross-section of Feature F-17.

F-18 Solution Cavity No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as a small upland sinkhole measuring approximately 5 feet in diameter by 1 foot deep that funnels into an open drainage portal about 0.5 feet in diameter by 1 foot deep among loose rocks and soil (Photo 66). Moderate to high air flow was observed at the opening. Preliminary hand excavation and probing revealed that the feature continues approximately 2 feet beneath the surface where loose small rocks and/or cobbles were detected. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. Fill material consisted of organics, root matter, and brown clayey soil. Excavation of this feature confirmed that it is karst in origin (Photo 67). The feature is a solution cavity and is a minor recharge feature but became too narrow to investigate further. **No Habitat Potential.**

Photo 66. Feature F-18 prior to Cambrian excavation.

Photo 67. Feature F-18 after Cambrian hand excavation.

F19 Cave **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole measuring approximately 30 feet long by 25 feet wide by 3 feet deep with multiple drainage portal openings among rocks, cobbles, and loose soil. Moderate to high air flow was noted at the openings. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature (Photo 68). Fill material consisted of limestone boulders and cobbles and dark brown soil. Signs of airflow and channelized recharge were detected. Excavation ceased when the feature became accessible for human entry (Photo 69). Excavation of this feature confirmed that it is karst in origin. The feature is a cave measuring at least 40 feet in diameter and contains habitat potential. The cave has the most vertical expression of known caves on the site descending immediately from the entrance at a roughly 45 degree angle. It reaches a total depth of approximately 20 feet below the surface. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 68. Feature F-19 prior to backhoe excavation.

Photo 69. View of Feature F-19 entrance after Cambrian backhoe and hand excavation.

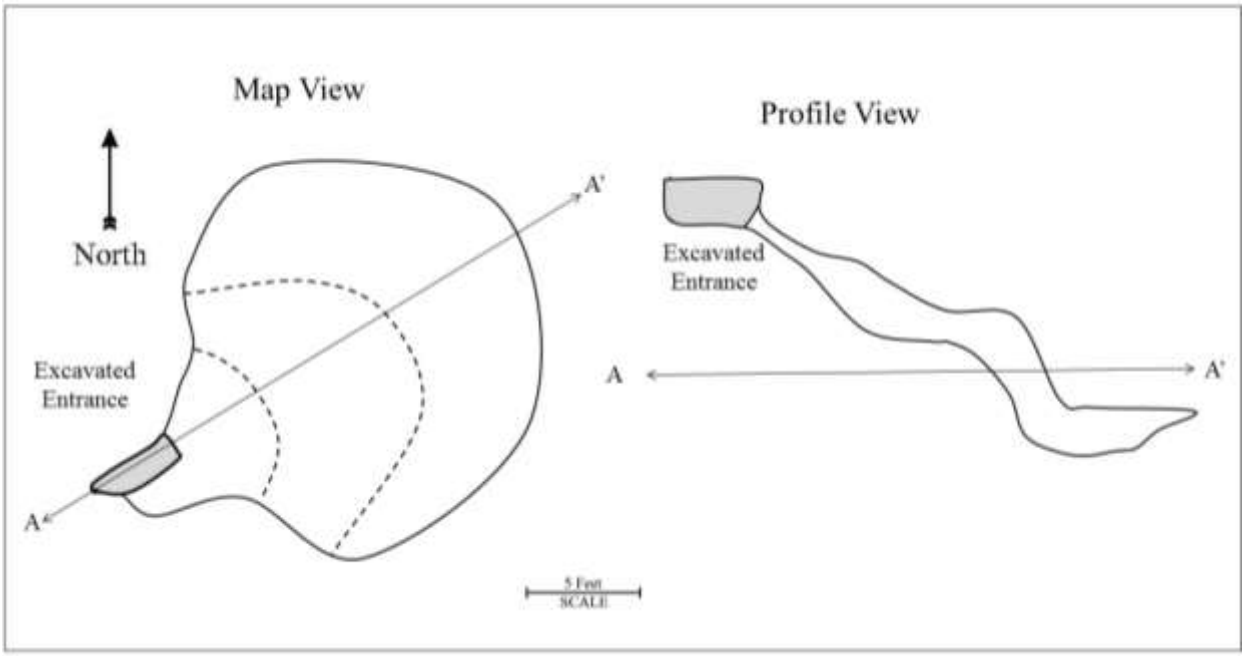


Figure 9. Map view and cross-section of Feature F-19.

F20 Solution Cavity Presence/Absence Investigations Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 20 feet in diameter by 3 feet deep with a small drainage portal opening with moderate to high air flow. The feature was classified as a potential cave.

Cambrian personnel conducted hand excavation in the feature. Fill material predominantly consisted of dark brown clayey soil and root mats from adjacent live oak, cedar elm, and juniper trees. Excavation of this feature confirmed that it is karst in origin, although no humanly-accessible passage was detected (Photo 70). The feature is a solution cavity that is likely an extension of Feature F-19 and measures approximately 2.5 feet in diameter by 3 feet deep. Cambrian personnel will conduct bait trapping in the feature.

Photo 70. Feature F-20 following Cambrian hand excavation.

Recharge and Transition Zone Exception Request Form

Texas Commission on Environmental Quality
30 TAC §213.9 Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.
Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Recharge and Transition Zone Exception Request Form** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Justin Midura
Date: 10-2-2024
Signature of Customer/Agent:

Regulated Entity Name: Woodfield Preserve Sidewalk Exception in Phase 7

Exception Request

1. ☒ **Attachment A - Nature of Exception**. A narrative description of the nature of each exception requested is attached. All provisions of 30 TAC §213 Subchapter A for which an exception is being requested have been identified in the description.
2. ☒ **Attachment B - Documentation of Equivalent Water Quality Protection**. Documentation demonstrating equivalent water quality protection for the Edwards Aquifer is attached.

Administrative Information

3. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
4. ☒ The applicant understands that no exception will be granted for a prohibited activity in Chapter 213.
5. ☒ The applicant understands that prior approval under this section must be obtained from the executive director for the exception to be authorized.

Recharge and Transition Zone Exception Request Form

ATTACHMENT A

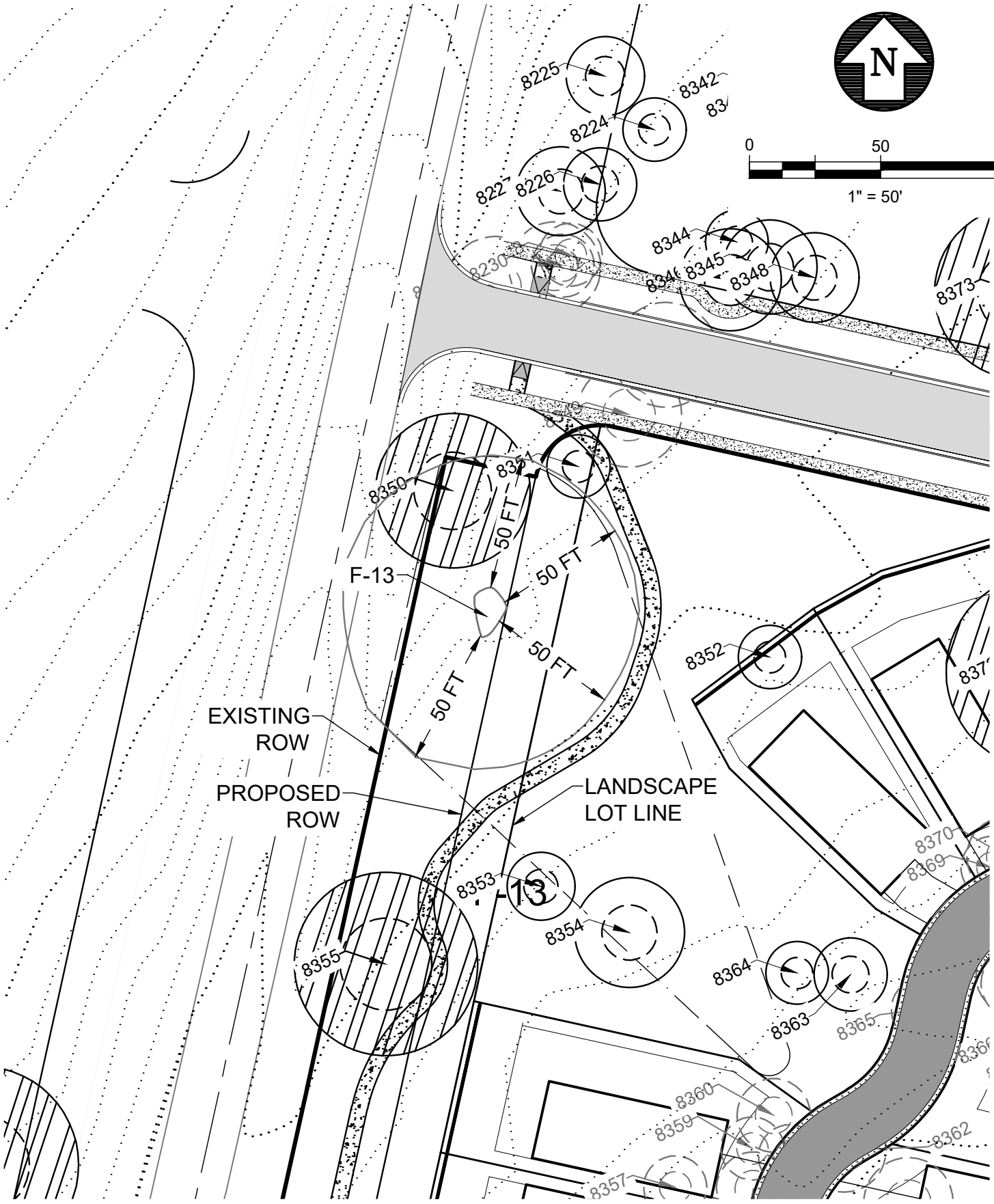
TCEQ EXCEPTION APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

Nature of Exception

The Woodfield Preserve Phase 7 project has a sidewalk/trail alignment that's adjacent to a known TCEQ karst feature (referred to as feature "F-13" in the geologic assessment). The main issue is this sidewalk stops on either side of the karst buffer and the Developer is asking if a connection can be made through the karst buffer to connect the sidewalk. Based on my understanding, per RG 348 Management of Sensitive Features Ch 5; pg 5-3, a trail/sidewalk is allowed as long as it stays 50' from the feature. The Developer is proposing the sidewalk connection go through the karst buffer, but stay 50' away from the feature. This proposed solution has already been presented and informally approved by TCEQ staff via email. As requested, the sidewalk will be concrete. Please see attached email correspondence with TCEQ discussing this proposed exception and confirming approval of the proposed solution.

Please see attached exhibit showing the new sidewalk/trail alignment staying minimum of 50' away from the F-13 feature.



LJA Engineering, Inc.

2700 La Frontera Blvd.
Suite 150
Round Rock, Texas 78681

Phone 512.439.4700
Fax 512.439.4716
FRN-F-1386

WOODFIELD PRESERVE
SIDEWALK EXCEPTION FOR
FEATURE "F-13"
10/1/2024

Date\Time : Tue, 01 Oct 2024 - 4:10pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Xref\SITE PLAN (CONDO)\EXHIBITS\WOODFIELD PRESERVE SIDEWALK EXCEPTION FOR F-13.dwg

Recharge and Transition Zone Exception Request Form

ATTACHMENT B

TCEQ EXCEPTION APPLICATION

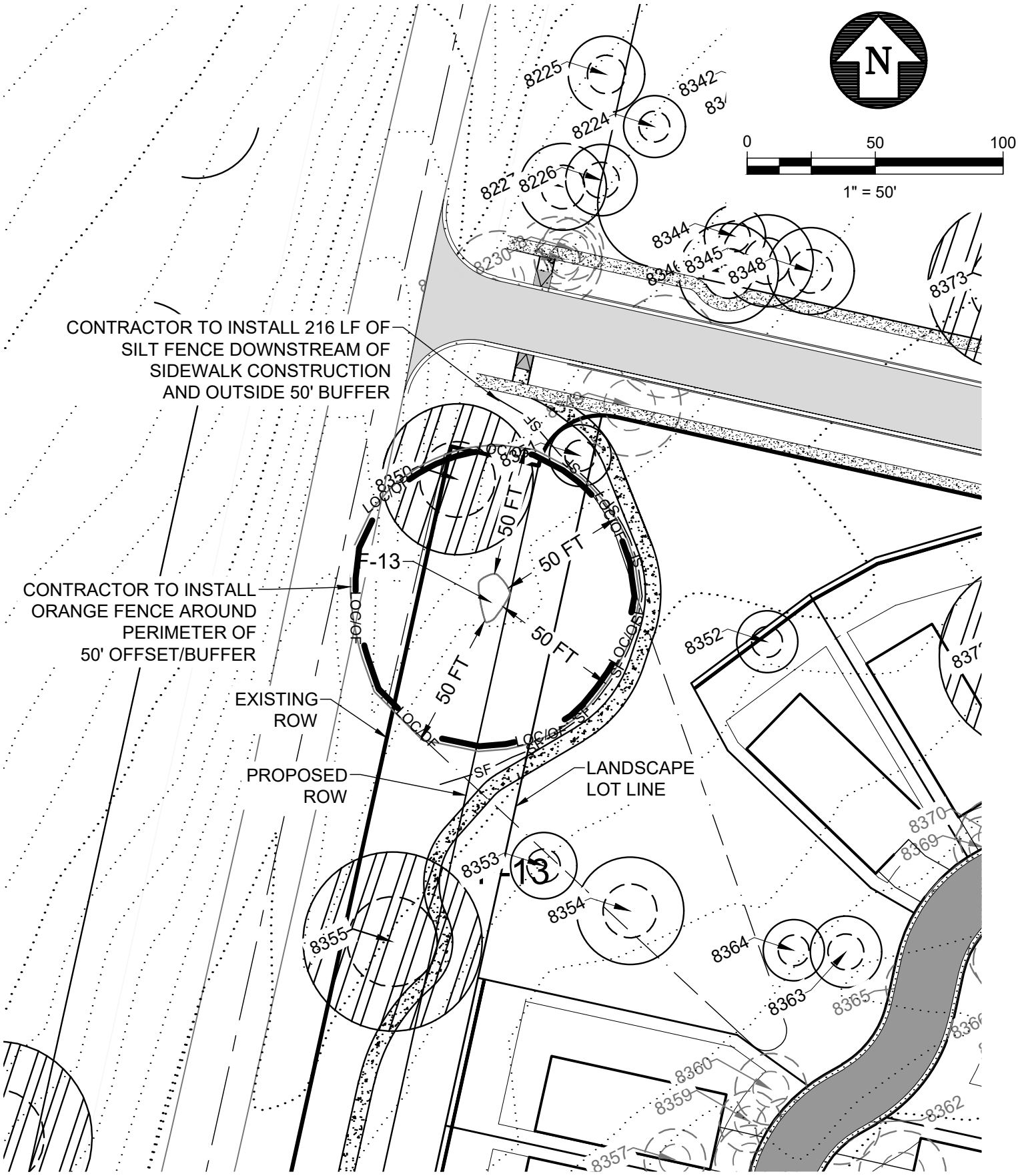
Woodfield Preserve Sidewalk Exception
Williamson County, Texas

Documentation of Equivalent WQ Protection

Per RG 348 Management of Sensitive Features Ch 5; pg 5-3, a trail/sidewalk is allowed as long as it stays 50' from the feature. Based on this criteria, this proposed solution is in conformance with the TCEQ Technical Guidance Manual "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices" for protecting the Edwards Aquifer water quality.

Additionally, erosion control is proposed to protect the F-13 feature from the sidewalk construction. Please see the proposed erosion control on the attached exhibit.

Lastly, the impervious cover from Phase 7 is accounted for in the approved Woodfield Preserve Phase 1 & 7 WPAP & SCS Edwards Aquifer Protection Program (EAPP) ID Nos. 11003313 (WPAP) and 11003314 (SCS). This impervious cover is being treated beyond the TCEQ minimum 80% TSS removal rate at 85% removal for the proposed improvements, providing better water quality reduction of TSS.



WOODFIELD PRESERVE
SIDEWALK EXCEPTION FOR
FEATURE "F-13"
10/1/2024

LJA Engineering, Inc.

2700 La Frontera Blvd.
Suite 150
Round Rock, Texas 78681

Phone 512.439.4700
Fax 512.439.4716
FRN-F-1386

Date\Time : Wed, 02 Oct 2024 - 11:38am User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Xref\SITE PLAN (CONDO)\EXHIBITS\WOODFIELD PRESERVE SIDEWALK EXCEPTION FOR F-13 WITH EC.dwg

Justin Midura

From: James Slone <james.slone@tceq.texas.gov>
Sent: Thursday, August 29, 2024 3:59 PM
To: Justin Midura
Cc: Chris
Subject: RE: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

https://www.tceq.texas.gov/permitting/eapp/material.html

It's subtle… **TCEQ-0628 Recharge and Transition Zone Exception Request Form**
About halfway down the page.

From: Justin Midura <jmidura@lja.com>
Sent: Thursday, August 29, 2024 3:12 PM
To: James Slone <james.slone@tceq.texas.gov>
Cc: Chris <chris@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

Bo,

Sounds good, the Developer would prefer concrete sidewalk as well so we're in agreement there.

Would you be so kind as to send me the website link / application for the Exception plan please? I'm looking online and not seeing it.

Thank you good sir,

Justin Midura, P.E.
Project Manager

LJA Engineering | Employee-Owned. Client Focused.
Central Texas Land Development
Office: 512-439-4700
Direct: 512-767-7352
Mobile: 512-788-1685
LJA.com
Facebook • Twitter • LinkedIn

From: James Slone <james.slone@tceq.texas.gov>
Sent: Thursday, August 29, 2024 3:03 PM
To: Justin Midura <jmidura@lja.com>
Cc: Chris <chris@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

Justin,
The way you have drawn (50 ft upgradient setback) it will work for us. You will need to submit an Exception plan for approval since it is an established buffer. We would prefer the sidewalk to remain concrete instead of decomposed granite since there is a better chance of the granite washing into the feature. Please let me know if you have questions.
Bo

James “Bo” Slone, P.G.
Team Leader
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality
(512) 239-6994

From: Justin Midura <jmidura@lja.com>
Sent: Thursday, August 29, 2024 1:32 PM
To: James Slone <james.slone@tceq.texas.gov>
Cc: Chris <chris@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

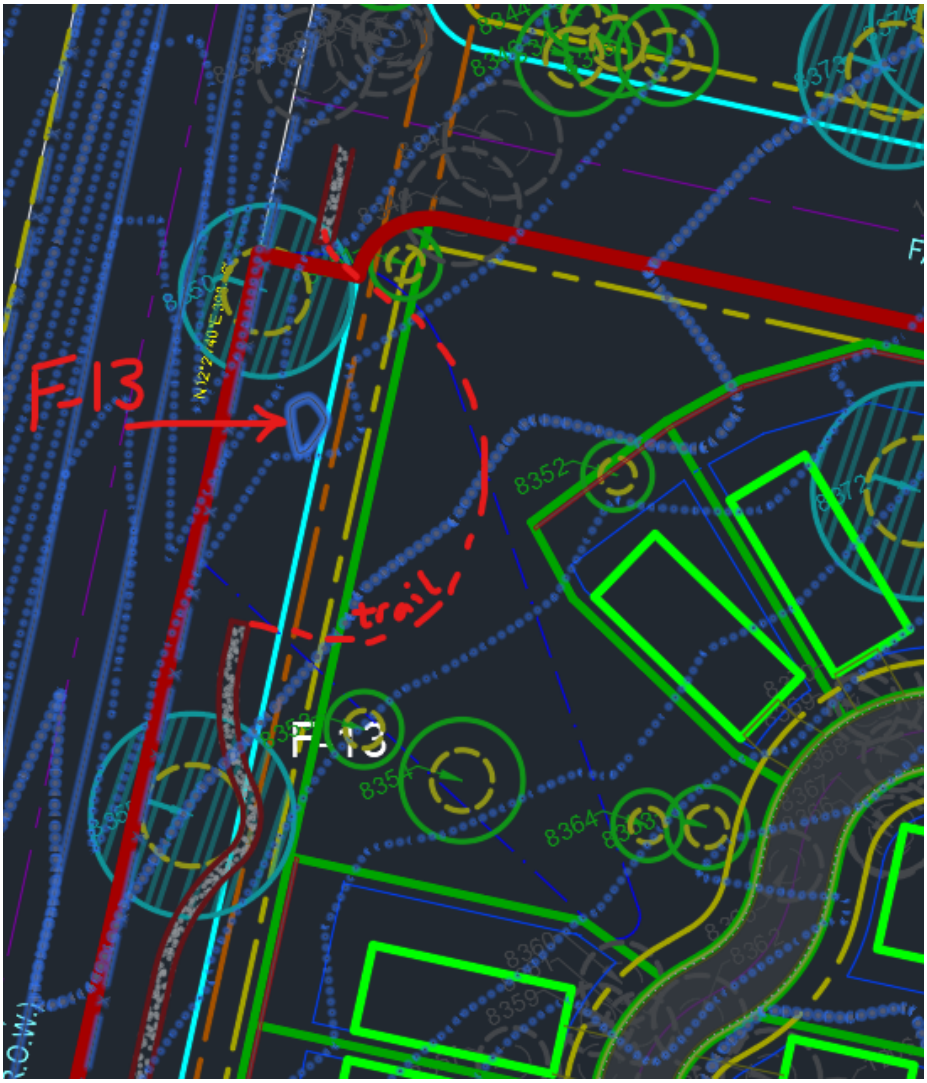
Hey Bo,

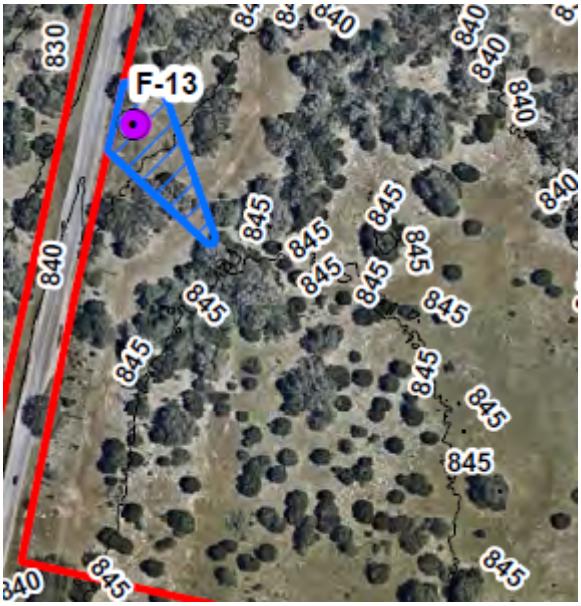
I think the trail could wrap around the feature and stay 50 ft away. The below screen shot shows the “F-13” feature and the proposed trail alignment through the buffer. Looks like cutting straight through would put the trail right on top of the feature.

Confirmed that drainage flows towards Shell Road (there’s an existing borrow ditch along the road).

Please see below excerpt from Horizon’s GA on how they classified F-13 feature:

> Geologic Feature F-13: Upland sinkhole measuring approximately 20 feet long x 6 feet wide x 2 feet deep, with 2 small (<2 inches) semi-open drainage portals about 12 feet apart among loose to firm clayey soil infilling. This feature appears to be partially filled with small rock and/or soil debris. Slight air flow conductivity was noted at the portal openings. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles about 3 feet below the surface. Somewhere between June to August of 2017, Cambrian mechanically excavated the feature using a backhoe (16.5 feet long x 4 to 11 feet wide x 7.5 feet deep) and deemed this feature to be a cave filled with soil. However, Horizon investigated the feature further and determined the feature is an upland sinkhole that lacks sufficient human- navigable passage to be considered a cave by TSS standards. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.





Justin Midura, P.E.
Project Manager

LJA Engineering | Employee-Owned. Client Focused.
Central Texas Land Development
Office: 512-439-4700

Direct: 512-767-7352
Mobile: 512-788-1685
LJA.com
Facebook • Twitter • LinkedIn

From: James Slone <james.slone@tceq.texas.gov>
Sent: Thursday, August 29, 2024 1:12 PM
To: Justin Midura <jmidura@lja.com>
Cc: Chris <chris@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

Hey Justin,
I have a couple of questions:
What's the maximum distance you can be away from the feature?
What type of feature is it (cave, solution cavity, etc)?
Can you confirm the drainage flows toward Shell Road?
Thanks,
Bo

James "Bo" Slone, P.G.
Team Leader
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality
(512) 239-6994

From: Justin Midura <jmidura@lja.com>
Sent: Wednesday, August 28, 2024 2:55 PM
To: James Slone <james.slone@tceq.texas.gov>
Cc: Chris <chris@waterloodevelopment.com>
Subject: FW: Sidewalk gap along Shell Road - Karst area

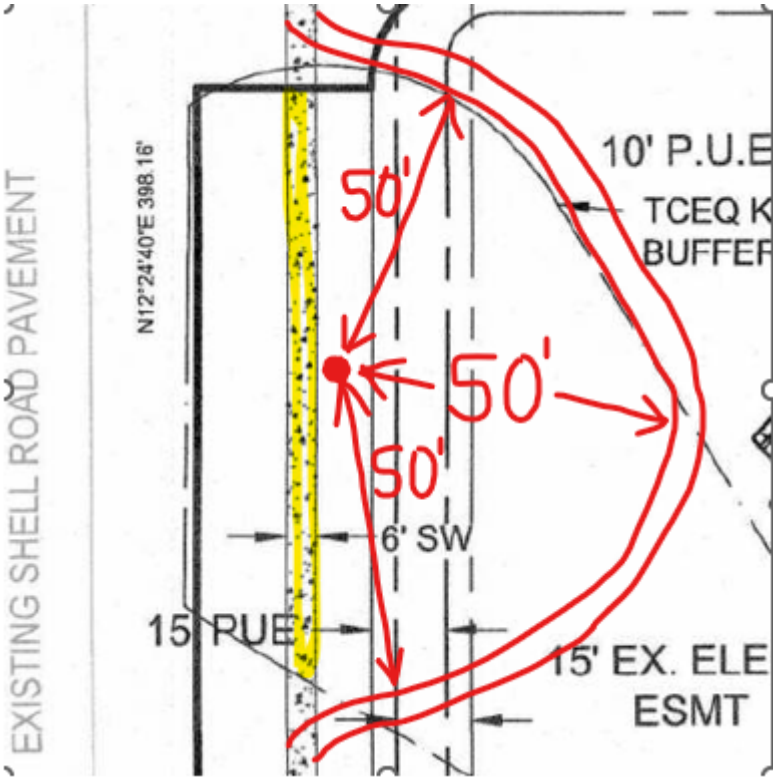
Good afternoon Bo,

Hope you've been well since we last spoke.

I'm reaching out regarding the Woodfield Preserve project and a sidewalk/trail alignment that's adjacent to a known TCEQ karst feature. The main issue is this sidewalk stops on either side of the karst buffer and the Developer is asking if a connection can be made through the buffer to connect the sidewalk (screen shot below on left is what's currently built where the sidewalk stops outside the buffer, which is shown in blue). Please see below email correspondence for reference. Based on the below screenshots, the yellow highlighted portion going straight through the buffer is what was originally desired before Horizon found and mapped the karst buffer.

Based on my understanding, per RG 348 Management of Sensitive Features Ch 5; pg 5-3, a trail/sidewalk is allowed as long as it stays 50' from the feature.

The Developer would like to install a hand dug decomposed granite trail connection going through the buffer. Would the 50’ offset be required, or could the trail go straight through the buffer like originally desired?



Justin Midura, P.E.
Project Manager

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Central Texas Land Development
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Direct: 512-767-7352
Mobile: 512-788-1685
LJA.com
Facebook • Twitter • LinkedIn

From: Suzanne <suzanne@waterloodevelopment.com>
Sent: Tuesday, August 27, 2024 10:34 PM
To: Justin Midura <jmidura@lja.com>
Cc: Chris <chris@waterloodevelopment.com>; Alex <alex@waterloodevelopment.com>
Subject: FW: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

Hi Justin,

This sidewalk connection at Phase 7 has come up again. Is there someone you could reach out to at TCEQ to see if a hand dug DG path to connect the sidewalk would be acceptable?

Thank you,
Suzanne Blackburn

WATERLOO DEVELOPMENT INC.
P.O. BOX 27335
Austin, Texas 78755
Office: (512) 346-3482
Cell: (512) 415-9574

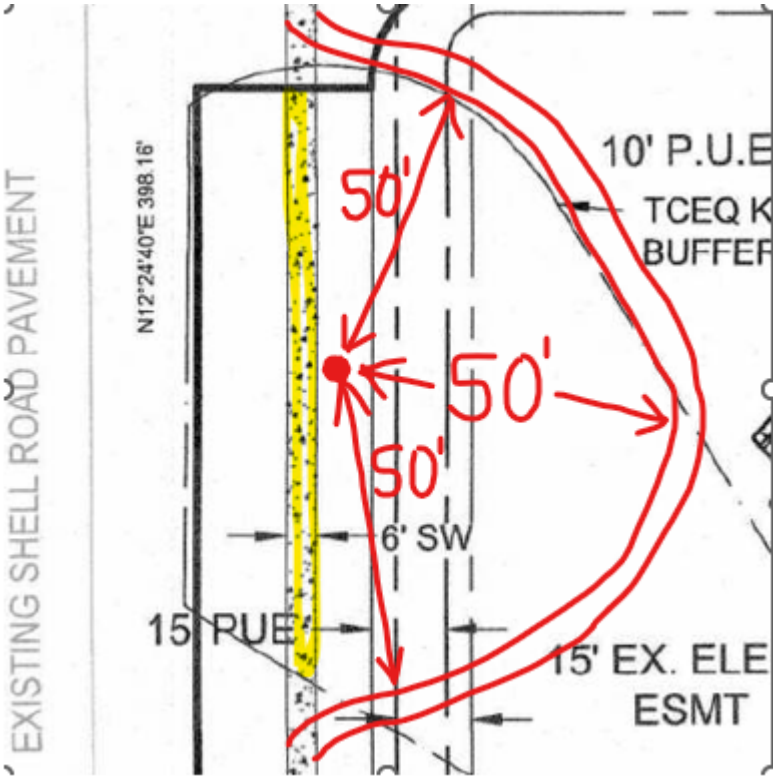
From: Mia Serrato <mia.serrato@lennar.com>
Sent: Tuesday, August 27, 2024 11:41 AM
To: Suzanne <suzanne@waterloodevelopment.com>
Cc: Alex <alex@waterloodevelopment.com>
Subject: Fwd: Sidewalk gap along Shell Road - Karst area

Mia Serrato
Land Development Manager
Mia.Serrato@Lennar.com
Mobile 737-325-7997

From: Justin Midura <jmidura@lja.com>
Sent: Friday, June 21, 2024 11:07:33 AM
To: Chris <chris@waterloodevelopment.com>; Mia Serrato <mia.serrato@lennar.com>; Bill Barton <bill.barton@lennar.com>
Cc: Suzanne <suzanne@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

Chris,

I spoke with Jim just now to confirm and this is really the only option available if trying to do a trail (would still need to confirm with TCEQ and get their permission first):



We would need to find the opening, but it's easy to spot now (the trail would need to be min 50' away from the opening):

Photo 51. Feature F-13 prior to Cambrian excavation.

Photo 52. Feature F-13 during Cambrian hand excavation.

Photo 53. Feature F-13 after Cambrian backhoe excavation.

Photo 54. Interior of Feature F-13 after Cambrian backhoe and hand excavation.

Justin Midura, P.E.
Project Manager

LJA Engineering | Employee-Owned. Client Focused.
Central Texas Land Development
Office: 512-439-4700
Direct: 512-767-7352
Mobile: 512-788-1685
LJA.com
Facebook • Twitter • LinkedIn

From: Chris <chris@waterloodevelopment.com>
Sent: Friday, June 21, 2024 9:55 AM
To: Mia Serrato <mia.serrato@lennar.com>; Justin Midura <jmidura@lja.com>; Bill Barton <bill.barton@lennar.com>
Cc: Suzanne <suzanne@waterloodevelopment.com>
Subject: RE: Sidewalk gap along Shell Road - Karst area

[EXTERNAL EMAIL]

Justin – Can we work a trail in and stay 50' from the feature?

Mia – I don't recall a CO deduct on this yet. We were trying to figure out what options we had to make a connection. Now that we have confirmation that we can't do concrete, I'll get a CO deduct from them. I would recommend we have DigDug or Perfect Cuts do this work. We can get pricing from them once Justin confirms if we have the room.

Thank you.

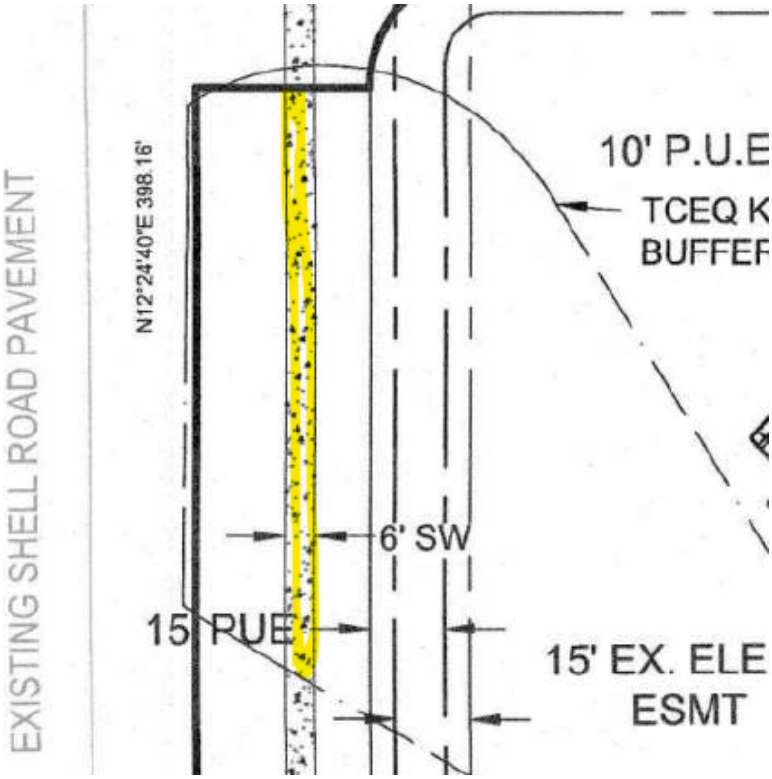
Chris Blackburn
WATERLOO DEVELOPMENT INC.

P.O. Box 27335
Austin, Texas 78755
Phone: 512-346-3482, ext. 101
Cell: 512-413-2892

From: Mia Serrato <mia.serrato@lennar.com>
Sent: Friday, June 21, 2024 9:45 AM
To: Chris <chris@waterloodevelopment.com>; Justin Midura <jmidura@lja.com>; Bill Barton <bill.barton@lennar.com>
Cc: Suzanne <suzanne@waterloodevelopment.com>
Subject: Re: Sidewalk gap along Shell Road - Karst area

Hi Chris,

I would like to look into doing a decomposed granite trail. Is JL Gray going to be completing the work? Did we get a deductive CO For the sidewalk not installed? Michael Coleman did let me know that we would need to bring granite in by the wheelbarrow and only disturb the area where the trail is going, so no equipment in the area.



Thanks,

Mia Serrato
Land Development Manager

LENNAR

Mia.Serrato@Lennar.com
Mobile 737-325-7997

From: Chris <chris@waterloodevelopment.com>
Sent: Thursday, June 20, 2024 5:49 PM
To: Justin Midura <jmidura@lja.com>; Mia Serrato <mia.serrato@lennar.com>; Bill Barton <bill.barton@lennar.com>
Cc: Suzanne <suzanne@waterloodevelopment.com>
Subject: Sidewalk gap along Shell Road - Karst area

All –

I reached out to Horizon about the sidewalk gap along Shell Road at Phase 7 due to the karst feature. Per below, we can't do any concrete, but we could do a trail (mulch, granite) to connect as long as it is 50' from the feature. Is this something we want to look at doing?

Thank you.

Chris Blackburn
WATERLOO DEVELOPMENT INC.

P.O. Box 27335
Austin, Texas 78755
Phone: 512-346-3482, ext. 101
Cell: 512-413-2892

From: James Killian <jkillian@horizon-esi.com>
Sent: Thursday, June 20, 2024 3:04 PM
To: Chris <chris@waterloodevelopment.com>; Scott Flesher <sflesher@horizon-esi.com>; Greg Sherrod <gsherrod@horizon-esi.com>
Subject: RE: Karst buffer question

No concrete since this would be considered construction and probably block runoff into the feature.

James Killian, PG
Senior Geologist
Horizon Environmental Services
C: 512.934.0358 | TBPG Firm No. 50679

From: Chris <chris@waterloodevelopment.com>
Sent: Thursday, June 20, 2024 3:02 PM
To: James Killian <jkillian@horizon-esi.com>; Scott Flesher <sflesher@horizon-esi.com>; Greg Sherrod <gsherrod@horizon-esi.com>
Subject: Re: Karst buffer question

[EXTERNAL EMAIL]

Can a hiking trail be concrete, or are we talking mulch or crushed granite?

Chris Blackburn
Waterloo Development, Inc.
Sent from my Samsung

From: James Killian <jkillian@horizon-esi.com>
Sent: Thursday, June 20, 2024 2:52:01 PM
To: Scott Flesher <sflesher@horizon-esi.com>; Chris <chris@waterloodevelopment.com>; Greg Sherrod <gsherrod@horizon-esi.com>
Subject: RE: Karst buffer question

From RG 348 Management of Sensitive Features Ch 5; pg 5-3:

It is recommended that the buffers around a point recharge feature or cluster of contiguous point recharge features be maintained in a natural state to the maximum practical extent. This implies a construction-free zone. Activities and structures allowed within buffer zones are limited. Hiking trails may be located in buffer zones as long as they are at least 50 feet from the feature. When all or a portion of the buffer for a sensitive feature is located within the yard of a residential tract, it should be separated by a barrier, such as a fence, from conventional landscaping and maintained in the natural state. The "natural state" of a buffer will typically be a combination of dense native grasses and forbs in a mosaic of shrubs and trees.

James Killian, PG
Senior Geologist
Horizon Environmental Services
C: 512.934.0358 | TBPG Firm No. 50679

From: Scott Flesher <sflesher@horizon-esi.com>
Sent: Thursday, June 20, 2024 2:44 PM
To: Chris <chris@waterloodevelopment.com>; Greg Sherrod <gsherrod@horizon-esi.com>; James Killian <jkillian@horizon-esi.com>
Subject: RE: Karst buffer question

Chris,

It is my understanding that no disturbance or vegetation clearing is allowed within a karst setback. This is also a case by case basis.

We could propose the sidewalk to TCEQ, try and pick an alignment that is already void of vegetation, and propose to plant a vegetation (grasses and forbs) strip between the sidewalk and karst feature.

Jim, any thoughts?

Thank you,

Scott Flesher
Vice President I Ecological Program Manager
Horizon Environmental Services
C: 512.695.4060 | TBPG Firm No. 50679

From: Chris <chris@waterloodevelopment.com>
Sent: Thursday, June 20, 2024 1:59 PM
To: Scott Flesher <sflesher@horizon-esi.com>; Greg Sherrod <gsherrod@horizon-esi.com>
Subject: Karst buffer question

[EXTERNAL EMAIL]

Scott/Greg –

Good afternoon. Question for you regarding karst buffer zones as it relates to the Woodfield project. We have one along Shell Road that has sidewalk ending on either side of the buffer. Understanding excavation, etc. can't be done, is it at all possible to build a "floating" sidewalk in a buffer area? Or is impervious cover also a no go?

Thank you.

Chris Blackburn
WATERLOO DEVELOPMENT INC.

P.O. Box 27335
Austin, Texas 78755
Phone: 512-346-3482, ext. 101
Cell: 512-413-2892

[EXTERNAL EMAIL] Exercise caution. Do not open attachments or click links from unknown senders or unexpected email

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Temporary Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Temporary Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Justin Midura, P.E.

Date: 10-2-2024

Signature of Customer/Agent:

Regulated Entity Name: Woodfield Preserve Sidewalk Exception in Phase 7

Project Information

Potential Sources of Contamination

Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

   ☐ The following fuels and/or hazardous substances will be stored on the site: _____

   These fuels and/or hazardous substances will be stored in:

   ☐ Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

☒ Fuels and hazardous substances will not be stored on the site.

2. ☒ **Attachment A - Spill Response Actions**. A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.

3. ☒ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

4. ☒ **Attachment B - Potential Sources of Contamination**. A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

Sequence of Construction

5. ☒ **Attachment C - Sequence of Major Activities**. A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.

   ☒ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.

   ☒ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: Berry Creek

Temporary Best Management Practices (TBMPs)

Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. All structural BMPs must be shown on the site plan.

7. ☒ **Attachment D – Temporary Best Management Practices and Measures**. TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information is attached:

☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

☒ A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. ☐ The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

   ☐ **Attachment E - Request to Temporarily Seal a Feature**. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

   ☒ There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. ☒ **Attachment F - Structural Practices**. A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.

10. ☒ **Attachment G - Drainage Area Map**. A drainage area map supporting the following requirements is attached:

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

    ☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

☒ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.

11. ☐ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations**. Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.

☒ N/A

12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.

13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

17. ☒ **Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices**. A schedule of the interim and permanent soil stabilization practices for the site is attached.

18. ☒ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. ☒ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

20. ☒ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

21. ☒ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

22. ☒ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

Temporary Stormwater Section

ATTACHMENT A

TCEQ SCS APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

Spill Response Actions:

1) Contain the spill.
2) Immediately stake off area.
3) Notify Hazardous Material team (if necessary); notify TCEQ:
   (512) 339-2929 or Emergency # 1-800-832-8224
4) Take necessary steps to clean up, i.e. notify remediation contractor if large spill, or small spills will be cleaned by the construction contractor

All Site personnel will be made aware of the manufacturers' recommended methods for spill cleanup and the location of information and cleanup supplies.

Spills will be reported according to the Reportable Quantity, attached on the following page.

Materials and equipment necessary for spill cleanup will be kept onsite in an accessible location known to site personnel.

All spills will be cleaned up immediately upon discovery. Any spill of hydrocarbons or hazardous substances greater than 25 gallons will require notification to the Fire Department Hazardous Materials Team and the TCEQ. As with all spills, an effort shall be made to prevent materials from entering surface streams and storm drains by using rock or earth berms to contain the material.

1.4.16 Spill Prevention and Control

The objective of this section is to describe measures to prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

The following steps will help reduce the stormwater impacts of leaks and spills:

Education

(1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.
(2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
(3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
(4) Establish a continuing education program to indoctrinate new employees.
(5) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

(1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
(2) Store hazardous materials and wastes in covered containers and protect from vandalism.
(3) Place a stockpile of spill cleanup materials where it will be readily accessible.
(4) Train employees in spill prevention and cleanup.
(5) Designate responsible individuals to oversee and enforce control measures.
(6) Spills should be covered and protected from stormwater runon during rainfall to the extent that it doesn't compromise clean up activities.
(7) Do not bury or wash spills with water.
(8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
(9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
(10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
(11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
(12) Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

(1) Clean up leaks and spills immediately.

(2) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.
(3) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

(1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
(2) Use absorbent materials on small spills rather than hosing down or burying the spill.
(3) Absorbent materials should be promptly removed and disposed of properly.
(4) Follow the practice below for a minor spill:
(5) Contain the spread of the spill.
(6) Recover spilled materials.
(7) Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities. Spills should be cleaned up immediately:
(1) Contain spread of the spill.
(2) Notify the project foreman immediately.
(3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:
(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
(3) Notification should first be made by telephone and followed up with a written report.
(4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
(5) Other agencies which may need to be consulted includ e, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc. More information on spill rules and appropriate responses is available on the TCEQ website at:
https://www.tceq.texas.gov/response/spills/spill_rq.html

Vehicle and Equipment Maintenance

(1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
(2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately
(3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
(4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
(5) Place drip pans or absorbent materials under paving equipment when not in use.
(6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
(7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
(8) Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
(9) Store cracked batteries in a non- leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

(1) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
(2) Discourage "topping off" of fuel tanks.
(3) Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Temporary Stormwater Section

ATTACHMENT B

TCEQ SCS APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

Potential Sources of Contamination:

Gasoline, Diesel, and Hydraulic Fluid from Construction Equipment,
Asphalt Products,
Construction Materials,
Trash and Debris,
Paint,
Concrete,
Gypsum from Sheet Rock
Sediment

All materials shall be hauled in a manner consistent with the manufacturer's recommendations. Disposal of waste material shall be in conformance with All State and Local Laws.

Kind of spill	Where discharged	Reportable quantity
Hazardous substance	onto land	"Final RQ" in Table 302.4 in 40 CFR 302.4 (PDF)
	into water	"Final RQ" or 100 lbs, whichever is **less**
Any oil	coastal waters	as required by the Texas General Land Office
Crude oil, oil that is neither a petroleum product nor used oil	onto land	210 gallons (five barrels)
	directly into water	enough to create a sheen
Petroleum product, used oil	onto land, from an exempt PST facility	210 gallons (five barrels)
	onto land, or onto land from a non-exempt PST facility	25 gallons
	directly into water	enough to create a sheen
Associated with the exploration, development and production of oil, gas, or geothermal resources	under the jurisdiction of the Railroad Commission of Texas	as required by the Railroad Commission of Texas
Industrial solid waste or other substances	into water	100 lbs
From petroleum storage tanks, underground or aboveground	into water	enough to create a sheen on water
From petroleum storage tanks, underground or aboveground	onto land	25 gallons or equal to the RQ under 40 CFR 302
Other substances that may be useful or valuable and are not ordinarily considered to be waste, but will cause pollution if discharged into water in the state	into water	100 lbs

Temporary Stormwater Section

ATTACHMENT C

TCEQ SCS APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

SEQUENCE of MAJOR ACTIVITIES:

1) Install temporary erosion control measures, stabilized construction entrance, and tree protection according to the plans and specifications prior to any clearing and grubbing, grading, excavating, etc. Notify Construction Inspection Division, when installed. Estimate of disturbed area = < 1 acre.

2) Prior to beginning construction, the owner or his authorized representative shall convene a Pre-Construction Conference between the TCEQ, Williamson County, consulting engineer, contractor, and any other affected parties. Notify TCEQ at least 48 hours prior to the time of the conference and 48 hours prior to the beginning of construction. Provide 72-hour notification of EV Inspection (at 512-974-2278) to pre-construction conference.

3) Hold pre-construction conference with Contractor, TCEQ, EV Inspector, Engineer, and Owner.

4) Begin installation of wastewater lines. Upon completion, restore as much disturbed areas as possible, particularly channels and large open areas. Estimate of disturbed area = < 1 acre.

5) Complete permanent erosion control and restoration of site vegetation. Estimate of disturbed area = < 1 acre.

6) Project Engineer to provide a written concurrence letter, and scheduling final inspection with EV Inspector, prior to the removal of erosion controls.

7) Remove and dispose of temporary erosion/sedimentation control measures.

8) Conduct a final inspection and complete all punch list items.

Clearing and grubbing under a development permit, solely for the purpose of surveying and soil exploration, shall be a hand cutting or blade-up operation

Temporary Stormwater Section

ATTACHMENT D

TCEQ SCS APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

Temporary Best Management Practices and Measures:

Install temporary erosion control measures, silt fence, and tree protection according to the plans and specifications prior to any clearing and grubbing, grading, excavating, etc.

All geologic features for this site are to be included in the geological assessment.

Temporary Stormwater Section

ATTACHMENT F

TCEQ SCS APPLICATION

Woodfield Preserve Phase 2
Williamson County, Texas

Structural Practices:

BMPs utilizing silt fence devices will be used during construction to control sediment runoff and divert runoff from entering the feature.

Stormwater runoff from the site will drain following the existing drainage pattern. The sidewalk shall be concrete to reduce trail material from washing into the feature.

Temporary Stormwater Section

ATTACHMENT G

TCEQ SCS APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

Drainage Area Map:

An overall drainage area map is included with this application.

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 9/15/2022
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH1_C_DM3.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
9-14-2022

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER: A245-1002

DM3

SHEET NO. 87 OF 93 SHEETS

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

811 Know what's below. Call before you dig.

WOODFIELD PRESERVE PHASE 7
CONDO SITE PLAN

INTERNAL DRAINAGE AREA MAP

Date/Time : Thu, 15 Sep 2022 - 11:32am
User Name : lthurt
Part Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 1 - SITE PLAN (CONDO)\A245-1002_PH1_C_DM3.dwg

GRATE INLET CALCULATIONS FOR 25YR STORM (ALL GRATE INLETS IN SUMP WITH 50% REDUCTION)

INLET#	INLET TYPE	Q NET (CFS)	GRATE AREA (SF)	HEAD (FT)	SUMP (FT)	OVERFLOW
C6	4.5x4.5	5.7	9.3	0.06	0.50	0.0
D11	4x4	6.0	7.4	0.12	0.50	0.0
E1	4x4	3.8	7.4	0.05	1.50	0.0

GRATE INLET CALCULATIONS FOR 25YR STORM (ALL GRATE INLETS ON GRADE WITH 35% REDUCTION)

INLET#	GRATE TYPE	GRATE QUANTITY	GRATE AREA (SF)	FLOW (CFS)	QBYPASS (CFS)	QTOTAL (CFS)	HEAD (FT)	GRATE CAP (CFS)	QBYPASS (CFS)	Q NET (CFS)	FLOW TO
C3	4.5x4.5	1	9.3	8.2	0.0	8.2	0.27	7.8	0.3	7.8	C4
C4	4.5x4.5	1	9.3	6.8	0.3	7.1	0.21	7.8	0.0	7.1	C5
C5	4x4	1	7.4	5.0	0.0	5.0	0.16	6.2	0.0	5.0	NA
C7	4x4	1	7.4	4.3	0.0	4.3	0.12	6.2	0.0	4.3	NA
C8	4x4	1	7.4	5.2	0.0	5.2	0.17	6.2	0.0	5.2	NA
D1	4x4	1	7.4	6.2	0.0	6.2	0.25	6.2	0.0	6.2	NA
D2	4x4	1	7.4	4.8	0.0	4.8	0.15	6.2	0.0	4.8	NA
D3	4x4	1	7.4	5.6	0.0	5.6	0.21	6.2	0.0	5.6	NA
D4	4x4	1	7.4	4.6	0.0	4.6	0.14	6.2	0.0	4.6	NA
D5	4x4	1	7.4	5.5	0.0	5.5	0.19	6.2	0.0	5.5	NA
D6	4x4	1	7.4	5.8	0.0	5.8	0.22	6.2	0.0	5.8	NA
D7	4x4	1	7.4	5.5	0.0	5.5	0.19	6.2	0.0	5.5	NA
D8	4x4	1	7.4	4.3	0.0	4.3	0.12	6.2	0.0	4.3	NA
D9	4x4	1	7.4	3.7	0.0	3.7	0.09	6.2	0.0	3.7	NA
D10	4x4	1	7.4	3.2	0.0	3.2	0.07	6.2	0.0	3.2	NA

STREET GUTTER DEPTH CALCULATIONS (TYPE 1) FOR 25YR STORM

AREA #	FLOW (CFS)	QBYPASS (CFS)	QTOTAL (CFS)	STREET CAP (CFS)	S (%)	Y (FT)	QX-OVER (CFS)	Q NET (CFS)	FLOW TO	STREET WIDTH (FT)	SPREAD (FT)	ALLOWABLE SPREAD (FT)	INLET TYPE
C1	4.0		4.0	16.6	0.90	0.29	0.0	4.0	NA	35	6.0	17.5	GRADE
C2	4.0		4.0	16.6	0.90	0.29	0.0	4.0	NA	35	6.0	17.5	GRADE
F2	4.4		4.4	17.0	1.20	0.30	0.0	4.4	NA	31	5.6	15.5	GRADE
F3	2.6		2.6	23.6	2.30	0.22	0.0	2.6	NA	31	3.8	15.5	GRADE
F5	7.1		7.1	26.0	2.80	0.31	0.0	7.1	NA	31	5.7	15.5	N/A

INLET CALCULATIONS FOR 100YR STORM (ALL INLETS ARE TYPE 1 ON GRADE)

INLET #	AREA #	ST WIDTH (FT)	QTOTAL (CFS)	STREET CAP (CFS)	S (%)	Y (FT)	QA/LA (CFS/FT)	LA (FT)	L (FT)	L/LA	A/Y	Q/QA	QIN (CFS)	QBYPASS (CFS)	FLOW TO
C1	C1	35	4.0	16.6	0.9	0.29	0.7	5.33	10	1.88	1.43	1.0000	4.0	0.0	NA
C2	C2	35	4.0	16.6	0.9	0.29	0.7	5.36	10	1.87	1.42	1.0000	4.0	0.0	NA
F2	F2	31	4.4	17.0	1.2	0.30	0.8	5.87	10	1.70	1.38	1.0000	4.4	0.0	NA
F3	F3	31	2.6	23.6	2.3	0.22	0.7	3.91	10	2.56	1.90	1.0000	2.6	0.0	NA
F5	F5	31	7.1	26.0	2.8	0.31	0.8	9.33	10	1.07	1.36	1.0000	7.1	0.0	NA

GRATE INLET CALCULATIONS FOR 100YR STORM (ALL GRATE INLETS IN SUMP WITH 50% REDUCTION)

INLET#	INLET TYPE	Q NET (CFS)	GRATE AREA (SF)	HEAD (FT)	SUMP (FT)	OVERFLOW
C6	4.5x4.5	12.7	9.3	0.32	0.50	0.0
D11	4x4	10.6	7.4	0.35	0.50	0.0
E1	4x4	4.9	7.4	0.07	0.50	0.0

GRATE INLET CALCULATIONS FOR 100YR STORM (ALL GRATE INLETS ON GRADE WITH 35% REDUCTION)

INLET#	GRATE TYPE	GRATE QUANTITY	GRATE AREA (SF)	FLOW (CFS)	QBYPASS (CFS)	QTOTAL (CFS)	HEAD (FT)	GRATE CAP (CFS)	QBYPASS (CFS)	Q NET (CFS)	FLOW TO
C3	4.5x4.5	1	9.3	10.2	0.0	10.2	0.43	7.8	2.4	7.8	C4
C4	4.5x4.5	1	9.3	8.5	2.4	10.9	0.49	7.8	3.1	7.8	C5
C5	4x4	1	7.4	6.3	3.1	9.3	0.56	6.2	3.1	6.2	C6
C7	4x4	1	7.4	5.3	3.3	8.7	0.48	6.2	2.4	6.2	C6
C8	4x4	1	7.4	6.5	3.1	9.6	0.59	6.2	3.3	6.2	C7
D1	4x4	1	7.4	7.7	0.0	7.7	0.38	6.2	1.5	6.2	D2
D2	4x4	1	7.4	6.0	1.5	7.5	0.37	6.2	1.3	6.2	D3
D3	4x4	1	7.4	7.1	1.3	8.4	0.45	6.2	2.1	6.2	D4
D4	4x4	1	7.4	5.8	2.1	7.9	0.40	6.2	1.7	6.2	D5
D5	4x4	1	7.4	6.8	2.5	9.3	0.56	6.2	3.1	6.2	C9
D6	4x4	1	7.4	7.3	0.0	7.3	0.34	6.2	1.0	6.2	D7
D7	4x4	1	7.4	6.8	1.0	7.9	0.40	6.2	1.6	6.2	D8
D8	4x4	1	7.4	5.4	1.6	7.0	0.32	6.2	0.8	6.2	D5
D9	4x4	1	7.4	4.6	0.0	4.6	0.14	6.2	0.0	4.6	NA
D10	4x4	1	7.4	4.0	0.0	4.0	0.10	6.2	0.0	4.0	NA

STREET GUTTER DEPTH CALCULATIONS (TYPE 1) FOR 100YR STORM

AREA #	FLOW (CFS)	QBYPASS (CFS)	QTOTAL (CFS)	STREET CAP (CFS)	S (%)	Y (FT)	QX-OVER (CFS)	Q NET (CFS)	FLOW TO	STREET WIDTH (FT)	SPREAD (FT)	ALLOWABLE SPREAD (FT)	INLET TYPE
C1	4.9		4.9	16.6	0.90	0.32	0.0	4.9	NA	35	6.6	17.5	GRADE
C2	4.9		4.9	16.6	0.90	0.32	0.0	4.9	NA	35	6.6	17.5	GRADE
F2	5.6		5.6	17.0	1.20	0.33	0.0	5.6	NA	31	6.2	15.5	GRADE
F3	3.3		3.3	23.6	2.30	0.24	0.0	3.3	NA	31	4.2	15.5	GRADE
F5	8.9		8.9	26.0	2.80	0.33	0.0	8.9	NA	31	6.3	15.5	GRADE

INLET CALCULATIONS FOR 100YR STORM (ALL INLETS ARE TYPE 1 ON GRADE)

INLET #	AREA #	ST WIDTH (FT)	QTOTAL (CFS)	STREET CAP (CFS)	S (%)	Y (FT)	QA/LA (CFS/FT)	LA (FT)	L (FT)	L/LA	A/Y	Q/QA	QIN (CFS)	QBYPASS (CFS)	FLOW TO
C1	C1	35	4.9	16.6	0.9	0.32	0.8	6.33	10	1.58	1.32	1.0000	4.9	0.0	NA
C2	C2	35	4.9	16.6	0.9	0.32	0.8	6.35	10	1.58	1.32	1.0000	4.9	0.0	NA
F2	F2	31	5.6	17.0	1.2	0.33	0.8	7.18	10	1.39	1.26	1.0000	5.6	0.0	NA
F3	F3	31	3.3	23.6	2.3	0.24	0.7	4.79	10	2.09	1.74	1.0000	3.3	0.0	NA
F5	F5	31	8.9	26.0	2.8	0.33	0.8	11.31	10	0.88	1.24	0.9258	8.3	0.7	B11B

RATIONAL METHOD - STORM WATER RUNOFF CALCULATIONS for DEVELOPED ONSITE DRAINAGE AREAS

IDF COEFFICIENTS

	2-YEAR	10-YEAR	25-YEAR	100-YEAR
a	106.29	96.84	111.070	129.03
b	16.81	15.88	17.230	17.830
c	0.9076	0.7952	0.7815	0.7625

RUNOFF COEFFICIENTS

	2-YEAR	10-YEAR	25-YEAR	100-YEAR
PERV.	0.24	0.28	0.31	0.36
IMP	0.97	0.97	0.97	0.97

DEVELOPED DRAINAGE AREAS

Drainage Area	TOTAL AREA (SF)	TOTAL AREA (AC)	IMP AREA (AC)	PERV AREA (SF)	PERV AREA (AC)	Tc (MIN)	C2 COMP	C10 COMP	C25 COMP	C100 COMP	I2 (IN/HR)	I10 (IN/HR)	I25 (IN/HR)	I100 (IN/HR)	Q2 (CFS)	Q10 (CFS)	Q25 (CFS)	Q100 (CFS)
C1	22631	0.520	0.401	5160.88	0.118	6.6	0.80	0.81	0.82	0.83	6.08	8.15	9.32	11.28	2.5	3.4	4.0	4.87
C2	21691	0.498	0.409	3854.18	0.088	6.3	0.84	0.85	0.85	0.86	6.14	8.23	9.41	11.38	2.6	3.5	4.0	4.88
C3	57810	1.327	0.730	25997.18	0.597	7.1	0.64	0.66	0.67	0.70	5.95	8.00	9.16	11.10	5.1	7.0	8.2	10.24
C4	48297	1.109	0.592	22516.12	0.517	6.8	0.63	0.65	0.66	0.69	6.03	8.09	9.26	11.21	4.2	5.8	6.8	8.52
C5	34411	0.790	0.436	15428.13	0.354	6.4	0.64	0.66	0.67	0.70	6.13	8.21	9.39	11.36	3.1	4.3	5.0	6.25
C6	39771	0.913	0.515	17338.80	0.398	7.2	0.65	0.67	0.68	0.70	5.94	7.98	9.14	11.07	3.5	4.9	5.7	7.12
C7	29302	0.673	0.380	12761.70	0.293	6.7	0.65	0.67	0.68	0.70	6.05	8.12	9.29	11.25	2.7	3.7	4.3	5.33
C8	36142	0.830	0.499	14393.72	0.330	8.3	0.68	0.70	0.71	0.73	5.71	7.70	8.84	10.73	3.2	4.4	5.2	6.47
D1	39957	0.917	0.525	17071.27	0.392	5.0	0.66	0.68	0.69	0.71	6.48	8.64	9.84	11.88	3.9	5.4	6.2	7.73
D2	31924	0.733	0.402	14401.83	0.331	5.0	0.64	0.66	0.67	0.69	6.48	8.64	9.84	11.88	3.0	4.2	4.8	6.05
D3	37209	0.854	0.469	16792.23	0.385	5.0	0.64	0.66	0.67	0.69	6.48	8.64	9.84	11.88	3.5	4.9	5.6	7.05
D4	39438	0.905	0.366	15940.82	0.366	5.0	0.49	0.51	0.52	0.54	6.48	8.64	9.84	11.88	2.9	4.0	4.6	5.78
D5	46116	1.059	0.433	18866.68	0.433	5.0	0.50	0.51	0.52	0.54	6.48	8.64	9.84	11.88	3.4	4.7	5.5	6.84
D6	38205	0.877	0.485	17087.09	0.392	5.0	0.64	0.66	0.67	0.70	6.48	8.64	9.84	11.88	3.7	5.0	5.8	7.26
D7	34925	0.802	0.470	14444.74	0.332	5.0	0.67	0.68	0.70	0.72	6.48	8.64	9.84	11.88	3.5	4.7	5.5	6.84
D8	28419	0.652	0.362	12649.42	0.290	5.0	0.65	0.66	0.68	0.70	6.48	8.64	9.84	11.88	2.7	3.7	4.3	5.41
D9	24024	0.552	0.310	10503.73	0.241	5.0	0.65	0.67	0.68	0.70	6.48	8.64	9.84	11.88	2.3	3.2	3.7	4.61
D10	20376	0.468	0.278	8280.10	0.190	5.0	0.67	0.69	0.70	0.72	6.48	8.64	9.84	11.88	2.0	2.8	3.2	4.01
D11	37919	0.870	0.522	15195.73	0.349	5.0	0.68	0.69	0.71	0.73	6.48	8.64	9.84	11.88	3.8	5.2	6.0	7.50
E1	30514	0.701	0.257	19330.25	0.444	5.0	0.51	0.53	0.55	0.58	6.48	8.64	9.84	11.88	2.3	3.2	3.8	4.86
F2	36301	0.833	0.360	20633.63	0.474	7.9	0.56	0.58	0.59	0.62	5.78	7.79	8.93	10.84	2.7	3.7	4.4	5.63
F3	19590	0.450	0.220	10028.07	0.230	6.8	0.60	0.62	0.63	0.66	6.02	8.09	9.25	11.21	1.6	2.2	2.6	3.31
F5	53242	1.222	0.615	26443.51	0.607	7.6	0.61	0.63	0.64	0.67	5.86	7.88	9.03	10.95	4.3	6.0	7.1	8.93
OS3	34886	0.801	0.000	34886.31	0.801	5.0	0.24	0.28	0.31	0.36	6.48	8.64	9.84	11.88	1.2	1.9	2.4	3.43

	I.C	Frequency	C_1 - Developed	C_2 - Undeveloped	Eqn. $C_{COM} = IC*C_1 + (1-IC)*C_2$
Impervious Cover	100%	2-YR	0.97	0.24	0.97
	100%	10-YR	0.97	0.28	0.97
	100%	25-YR	0.97	0.31	0.97
	100%	100-YR	0.97	0.36	0.97
Open Space	0%	2-YR	0.97	0.24	0.24
	0%	10-YR	0.97	0.28	0.28
	0%	25-YR	0.97	0.31	0.31
	0%	100-YR	0.97	0.36	0.36

Inlet Type	*Open Area*
4x2	3.7
4x4	7.4
4x3	5.3
4.5x4.5	9.3

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

811 Know what's below. Call before you dig.

WOODFIELD PRESERVE PHASE 7
CONDO SITE PLAN

INTERNAL DRAINAGE CALCULATIONS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 9/15/2022
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH1_C_DM4.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED
PROFESSIONAL ENGINEER
9-14-2022

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER: A245-1002

DM4

SHEET NO. 88

OF 93 SHEETS

2022-48-SDP

Temporary Stormwater Section

ATTACHMENT I

TCEQ SCS APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

Inspection and Maintenance for Best Management Practices:

Best Management Practices installed during construction will be maintained in accordance with the requirements of the EPA's NPDES/TPDES stormwater pollution prevention program. The following maintenance procedures shall be followed until permanent stabilization occurs.

Silt Fence

a. Inspect weekly or after each rainfall event and repair or replacement shall be made promptly as needed.
b. Silt fence shall be removed when the site is completely stabilized so as to not block or impede storm flow or drainage.
c. Accumulated silt shall be removed when it reaches a depth of 6 inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.

Concrete Washout

a. Inspection shall be made daily or after each rainfall event to check to leaks, identify any plastic linings and sidewalls have been damaged by construction activities.
b. When the washout container is filled over 75 percent of its capacity, the washwater should be vacuumed off or allowed to evaporate to avoid overflows. When the remaining cementitious solids have hardened, they should be removed and recycled.
c. Damages to the container should be repaired promptly.
d. Before heavy rains, the washout container's liquid level should be lowered, or the container should be covered to avoid an overflow during the rain storm.
e.

The owner shall hire an E&S compliance company to inspect E&S measures and keep reports of onsite inspections with deficiencies and solutions.

Temporary Stormwater Section

ATTACHMENT J

TCEQ SCS APPLICATION

Woodfield Preserve Sidewalk Exception
Williamson County, Texas

Schedule of Interim and Permanent Soil Stabilization Practices:

Soil Stabilization for all disturbed areas shall be accomplished by hydraulic planting. Following is an outline to accomplish the required stabilization.

1. Preparing Seed Bed. After the designated areas have been rough graded to the lines, grades and typical sections indicated in the Drawings or as provided for in other items of this contract and for any other soil area disturbed by the construction, a suitable seedbed shall be prepared. The seedbed shall consist of a minimum of either 4 inches (100 millimeters) of approved topsoil or 4 inches (100 millimeters) of approved salvaged topsoil, cultivated and rolled sufficiently to enhance the soil to a state of good health, when the soil particles on the surface are small enough and lie closely enough together to prevent the seed from being covered too deeply for optimum germination. The optimum depth for seeding shall be 1/4 inch (6 millimeters). Water shall be gently applied as required to prepare the seedbed prior to the planting operation either by broadcast seeding or hydraulic planting. Bare soils should be seeded or otherwise stabilized within 14 calendar days after final grading or where construction activity has temporarily ceased for more than 21 days. Seeding shall be performed in accordance with the requirements hereinafter described.

2. Watering. All watering shall comply with Chisholm Trail Subdivision Rules and Regulations. Broadcast seeded areas shall immediately be watered with a minimum of 5 gallons of water per square yard (22.5 liters of water per square meter) or as needed and in the manner and quantity as directed by the Engineer or designated representative. Hydraulic seeded areas and native grass seeded areas shall be watered commencing after the tackifier has dried with a minimum of 5 gallons of water per square yard (22.5 liters of water per square meter) or as needed to keep the seedbed in a wet condition favorable for the growth of grass.

Watering applications shall constantly maintain the seedbed in a wet condition favorable for the growth of grass. Watering shall continue until the grass is uniformly 1 1/2 inches (40 mm) in height and accepted by the Engineer or designated representative. Watering can be postponed immediately after a 1/2 inch (12.5 mm) or greater rainfall on the site but shall be resumed before the soil dries out.

3. Hydraulic Planting. The seedbed shall be prepared as specified above and hydraulic planting equipment, which is capable of placing all materials in a single operation, shall be used.

March 1 to September 15

Hydraulic planting mixture and minimum rate of application pounds per 1000 square feet (kilograms per 100 square meters):

Planting Mixture			
Hulled Bermuda Seed (PLS=0.83)	Fiber Mulch		Soil Tackifier
	Cellulose	Wood	
1 Lbs/1000 ft2 (0.5 kgs/100 m2))	45.9 Lbs/1000 ft2 (22.5 kgs/100 m2))		1.4 Lbs/1000 ft2 (0.7 kgs/100 m2))
		57.4 Lbs/1000 ft2 (28.01 kgs/100 m2))	1.5 Lbs/1000 ft2 (0.75 kgs/100 m2))

September 15 to March 1

Add 1.5 pounds per 1000 square feet (0.75 kilograms per 100 square meters) of cool season cover crop (see Table 1) to above mixture. The fertilizer shall conform to City of Austin Standard Specification Item No. 606S, "Fertilizer".

Table 1: Cool Season Cover Crop

Common Name	Botanical Name	Application rates	
		Lbs/1000 feet ^{2}	kg/ 100 meter^2
Wheat	Triticum aestivum	0.5	0.25
Oats	Avena sativa	0.5	0.25
Cereal Rye Grain	Secale cereale	0.5	0.25
Total Cool Season Cover Crop Seeding Rate		1.5	0.75
Total Cool Season Seeding Rate (Grass, Wildflowers, & Cover Crop)		4.5	2.25

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I Larry Colditz,
Print Name

Authorized Signatory,
Title - Owner/President/Other

of LSMA Georgetown, LLC,
Corporation/Partnership/Entity Name

have authorized Justin Midura, P.E.
Print Name of Agent/Engineer

of LJA Engineering, Inc.
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Applicant's Signature

9/14/22
Date

THE STATE OF Florid §

County of Manatee §

BEFORE ME, the undersigned authority, on this day personally appeared **Lawrence Colditz** known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 14 day of September 2022.

NOTARY PUBLIC

LORI E. JOYCE
MY COMMISSION # GG 350514
EXPIRES: September 19, 2023
Bonded Thru Notary Public Underwriters

Lori E. Joyce
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 9/19/23

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: Woodfield Preserve Sidewalk Exception in Phase 7
Regulated Entity Location: South of Shell Road between SH 195 and FM 338
Name of Customer: Larry Colditz
Contact Person: Justin Midura, P.E. Phone: 512-439-4700
Customer Reference Number (if issued):CN CN606070779
Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment**. This payment is being submitted to:

☒ Austin Regional Office
☐ Mailed to: TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ San Antonio Regional Office
☐ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	*Size*	*Fee Due*
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	1 Each	$ 500
Extension of Time	Each	$

Signature: [signature] Date: 10-2-2024

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal (*Core Data Form should be submitted with the renewal form*) ☐ Other

2. Customer Reference Number (if issued)	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number (if issued)
CN 606070779		RN

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☐ New Customer ☒ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name (*If an individual, print last name first: eg: Doe, John*) *If new Customer, enter previous Customer below:*

LSMA Georgetown, LLC

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
		87-2466381	

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☒ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees
☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?
☒ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☒ Owner ☐ Operator ☐ Owner & Operator ☐ Other:
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant

15. Mailing Address:								
	8433 Enterprise Circle							
	Ste 100							
	City	Lakewood Ranch	**State**	FL	**ZIP**	34202	**ZIP + 4**	

16. Country Mailing Information (if outside USA)	17. E-Mail Address (if applicable)

18. Telephone Number	19. Extension or Code	20. Fax Number (if applicable)
(941) 388-0707		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

Woodfield Preserve Sidewalk Exception in Phase 7

23. Street Address of the Regulated Entity:								
(No PO Boxes)	**City**		**State**		**ZIP**		**ZIP + 4**	
24. County								

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	South of Shell Rd between SH 195 and Williams Drive, north of Woodfield Phase 1, south of Woodfield Phase 3				
26. Nearest City			**State**	**Nearest ZIP Code**	
Georgetown			TX	78628	

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:	30.69924444		**28. Longitude (W) In Decimal:**	97.70728056	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	41	57.28	97	42	26.21

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
6552		237210	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Residential Subdivision

34. Mailing Address:	**Same as above**							
	City	**Lakewood Ranch**	**State**	**FL**	**ZIP**	**34202**	**ZIP + 4**	
35. E-Mail Address:	**Lcolditz@starwoodland.com**							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(303) 720-4436		**( ) -**

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste

☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

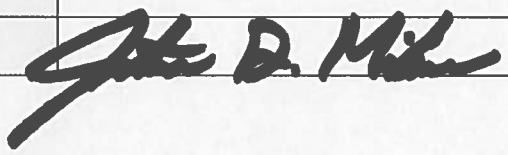
SECTION IV: Preparer Information

40. Name:	Justin Midura, P.E.	41. Title:	Project Manager

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(512) 439-4700		( ) -	Jmidura@lja.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	LJA Engineering, Inc.	Job Title:	Project Manager
Name *(In Print)*:	Justin Midura, P.E.	Phone:	(512) 439- 4700
Signature:		Date:	10-2-2024