WASTE CONNECTIONS
Connect with the Future®

February 25, 2022

Mr. Toby Baker
Executive Director
MC-109
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, Texas 78753

Re: Turkey Creek Landfill
Major Permit Amendment Application, TCEQ Permit No. MSW-1417D
Johnson County

Dear Mr. Baker:

Please find enclosed a major permit amendment application to expand the Turkey Creek Landfill. Included are four copies of the application for your review and comment. Parts I through IV are included, as required by the Texas Commission on Environmental Quality's (TCEQ) municipal solid waste regulations.

The purpose of this Major Permit Amendment is to secure authorization for an expansion of the existing Turkey Creek Landfill, TCEQ Permit No. MSW-1417C. The existing 146.4-acre waste area will be expanded by 25.6 acres. The existing permit boundary is not proposed to be changed by this application. The maximum permitted final cover elevation will be increased from 946 ft-msl to 996 ft-msl. The Turkey Creek Landfill has provided for the municipal solid waste (MSW) disposal needs of Johnson County and surrounding areas for over 35 years. This major permit amendment will ensure that this critical service will continue for the landfill's service area.

Texas Regional Landfill Company, LP is fully committed to operating the Turkey Creek Landfill consistent with TCEQ rules for the protection of human health and the environment.

We appreciate your review of this permit application and look forward to your comments. In the meantime, if you have any questions, please do not hesitate to contact me.

Sincerely,

Gary Bartels
Southern Region Engineer

Copies submitted: 1 original and 3 copies (6 volumes per set)

cc: TCEQ Region 4 Office
Site Operating Record
Nevzat Turan, P.E., Weaver Consultants Group, LLC

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

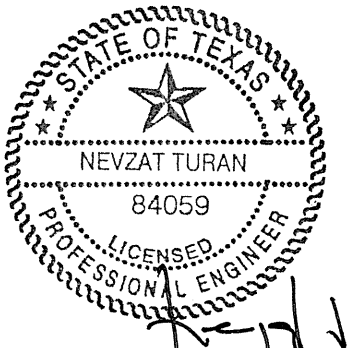
MAJOR PERMIT AMENDMENT APPLICATION

VOLUME 1 OF 6

Prepared for

Texas Regional Landfill Company, LP

February 2022



02/22/22

Prepared by

Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-123

This document intended for permitting purposes only.

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

MAJOR PERMIT AMENDMENT APPLICATION
VOLUME 1 OF 6

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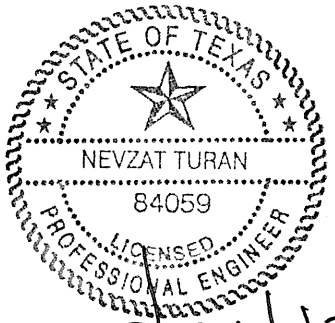

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TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

MAJOR PERMIT AMENDMENT APPLICATION

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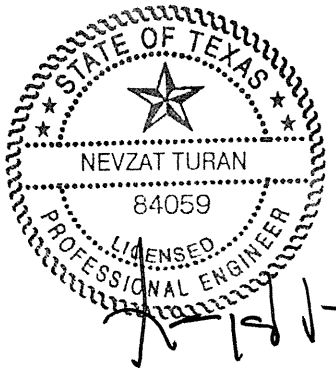
February 2022



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TURKEY CREEK LANDFILL MAJOR PERMIT AMENDMENT APPLICATION
TCEQ PERMIT NO. MSW-1417D

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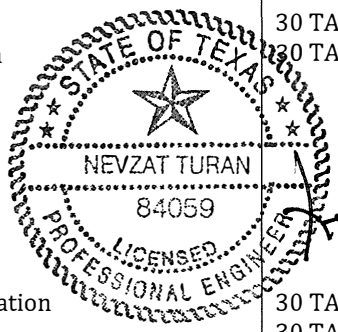

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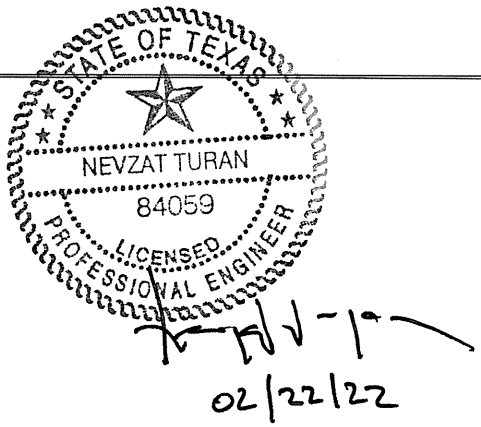

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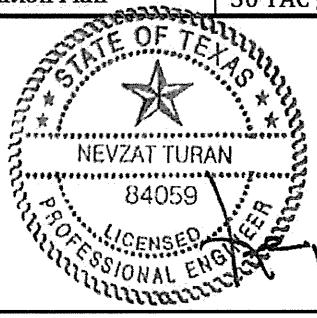


02/22/22

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

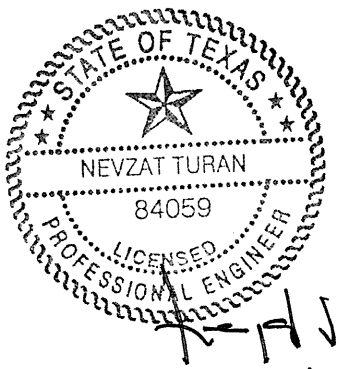
MAJOR PERMIT AMENDMENT APPLICATION

TCEQ PART I APPLICATION FORM, CORE DATA FORM, AND MAILING LABELS

Prepared for

Texas Regional Landfill Company, LP

February 2022



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TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

MAJOR PERMIT AMENDMENT APPLICATION
TCEQ PART I APPLICATION FORM, CORE DATA FORM, AND MAILING LABELS

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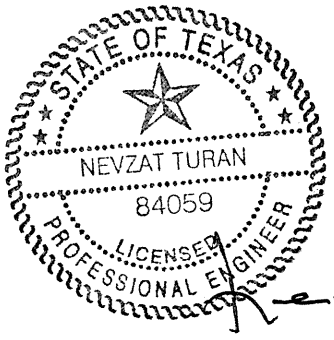
PART I FORM

CORE DATA FORM

MAILING LABELS (on CD)



02/22/22

Facility Name: Turkey Creek Landfill
Permittee/Registrant Name: Texas Regional Landfill Company, LP
MSW Authorization #:1417D
Initial Submittal Date: February 2022
Revision Date:

Texas Commission on Environmental Quality

Part I Application Form for New Permit, Permit Amendment, or Registration for a Municipal Solid Waste Facility

1. Reason for Submittal

☒ Initial Submittal ☐ Notice of Deficiency (NOD) Response

2. Authorization Type

☒ Permit ☐ Registration

3. Application Type

☐ New Permit ☒ Permit Major Amendment ☐ Permit Major Amendment (Limited Scope)

☐ New Registration

4. Application Fees

Amount

☒ $2,050 for Permits and Permit Amendments ☐ $150 for Registrations

Payment Method

☐ Check ☒ Online through ePay portal <https://www3.tceq.texas.gov/epay/>

If paid online, enter ePay Trace Number: **582EA000479655**

5. Application URL

Is the application submitted for a Type I Arid Exempt (AE) or Type IV AE facility?

☐ Yes ☒ No

If the answer is "No", provide the URL address of a publicly accessible internet web site where the application and all revisions to that application will be posted.
http://**ftwweaverboos.com**

6. Application Publishing

Party Responsible for Publishing Notice:

☐ Applicant ☐ Agent in Service ☒ Consultant

Contact Name: **Nevzat Turan, P.E.** Title: **Senior Engineer**

7. Alternative Language Notice

Is an alternative language notice required for this application? (For determination refer to Alternative Language Checklist on the Public Notice Verification Form TCEQ-20244-Waste)

☒ Yes ☐ No

8. Public Place Location of Application

Name of the Public Place: **Alvarado Public Library**

Physical Address: **210 N. Baugh St.**

City: **Alvarado** County: **Johnson** State: **Texas** Zip Code: **76009**

(Area code) Telephone Number: **(817) 783-7323**

9. Consolidated Permit Processing

Is this submittal part of a consolidated permit processing request, in accordance with 30 TAC Chapter 33?

☐ Yes ☒ No ☐ Not Applicable

If "Yes", state the other TCEQ program authorizations requested:

10. Confidential Documents

Does the application contain confidential documents?

☐ Yes ☒ No

If "Yes", cross-reference the confidential documents throughout the application and submit as a separate attachment in a binder clearly marked "CONFIDENTIAL."

11. Permits and Construction Approvals

Permit or Approval	Received	Pending	Not Applicable
Hazardous Waste Management Program under the Texas Solid Waste Disposal Act	☐	☐	☒
Underground Injection Control Program under the Texas Injection Well Act	☐	☐	☒
National Pollutant Discharge Elimination System Program under the Clean Water Act and Waste Discharge Program under Texas Water Code, Chapter 26	☒	☐	☐
Prevention of Significant Deterioration Program under the Federal Clean Air Act (FCAA). Nonattainment Program under the FCAA	☐	☐	☒
National Emission Standards for Hazardous Air Pollutants Preconstruction Approval under the FCAA	☐	☐	☒
Ocean Dumping Permits under the Marine Protection Research and Sanctuaries Act	☐	☐	☒
Dredge or Fill Permits under the CWA	☐	☐	☒
Licenses under the Texas Radiation Control Act	☐	☐	☒
Other (describe) Air, Stormwater, Petroleum Storage Tank	☒	☐	☐
Other (describe)	☐	☐	☐
Other (describe)	☐	☐	☐

12. General Facility Information

Facility Name: **Turkey Creek Landfill**

Contact Name: **Gary Bartels** Title: **Southern Region Engineer**

MSW Authorization No. (if available): **MSW-1417C**

Regulated Entity Reference No. (if issued)*: RN**100825462**

Physical or Street Address (if available): **9100 S. Interstate 35W**

City: **Alvarado** County: **Johnson** State: **TX** Zip Code: **76009**

(Area Code) Telephone Number: **(817) 790-0311**

Latitude (Degrees, Minutes Seconds): **N 32° 21′ 27″**

Longitude (Degrees, Minutes Seconds): **W 97° 12′ 14**

Benchmark Elevation (above mean sea level): **684.64** ft.

Provide a description of the location of the facility with respect to known or easily identifiable landmarks: **The facility is located near the intersection of Interstate Highway 35W S and Johnson County Road 107.**

Detail access routes from the nearest United States or state highway to the facility: **From I-35W S take exit 21 toward County Road 107, turn right into the facility.**

*If this number has not been issued for the facility, complete a TCEQ Core Data Form (TCEQ-10400) and submit it with this application. List the Facility as the Regulated Entity.

13. Facility Type(s)

☒ Type I ☐ Type IV ☐ Type V
☐ Type I AE ☐ Type IV AE ☐ Type VI

14. Activities Conducted at the Facility

☒ Storage ☒ Processing ☒ Disposal

15. Facility Waste Management Unit(s)

☒ Landfill Unit(s)
☒ Class 1 Landfill Unit(s)
☐ Process Tank(s)
☒ Storage Tank(s)
☐ Tipping Floor
☐ Storage Area
☐ Container(s)
☐ Roll-off Boxes
☐ Surface Impoundment
☐ Incinerator(s)
☐ Autoclave(s)
☐ Refrigeration Unit(s)
☐ Mobile Processing Unit(s)
☐ Type VI Demonstration Unit
☐ Compost Pile(s) and/or Vessel(s)
☒ Other (specify): **Liquid waste solidification**
☒ Other (specify): **Citizens Convenience Center**
☐ Other (specify)

16. Description of Proposed Facility or Changes to Existing Facility

Provide a brief description of the proposed activities if application is for a new facility, or the proposed changes to an existing facility or permit conditions if the application is for an amendment.
The purpose of this major permit amendment application is to expand the currently permitted landfill footprint.

17. Facility Contact Information

Site Operator (Permittee/Registrant) Name: Texas Regional Landfill Company, LP

Customer Reference No. (if issued)*: CN**601668486**

Contact Name: **Gary Bartels** Title: **Southern Region Engineer**

Mailing Address: **3 Waterway Square Place, Suite 550**

City: **The Woodlands** County: **Montgomery** State: **TX** Zip Code: **77380**

(Area Code) Telephone Number: **(817) 705-6072**

Email Address: **gary.bartels@wasteconnections.com**

TX Secretary of State (SOS) Filing Number: **0012151910**

*If the Site Operator (Permittee/Registrant) does not have this number, complete a TCEQ Core Data Form (TCEQ-10400) and submit it with this application. List the Site Operator (Permittee/Registrant) as the Customer.

Operator Name[1]: Same as Site Operator (Permittee/Registrant)

Customer Reference No. (if issued)*:

Contact Name: Title:

Mailing Address:

City: County: State: Zip Code:

(Area Code) Telephone Number:

Email Address:

TX SOS Filing Number:

[1]If the Operator is the same as Site Operator/Permittee type "Same as "Site Operator (Permittee/Registrant)".
*If the Operator does not have this number, complete a TCEQ Core Data Form (TCEQ-10400) and submit it with this application. List the Operator as the customer.

Consultant Name (if applicable): Weaver Consultants Group, LLC

Texas Board of Professional Engineers Firm Registration Number: **F-3727**

Contact Name: **Nevzat Turan, P.E.** Title: **Senior Engineer**

Mailing Address: **6420 Southwest Boulevard, Suite 206**

City: **Fort Worth** County: **Tarrant** State: **TX** Zip Code: **76109**

(Area Code) Telephone Number: **(817) 735-9770**

E-Mail Address: **nturan@wcgrp.com**

Agent in Service Name (required only for out-of-state):

Mailing Address:

City: County: State: Zip Code:

(Area Code) Telephone Number:

E-Mail Address:

18. Facility Supervisor's License

Select the Type of License that the Solid Waste Facility Supervisor, as defined in 30 TAC Chapter 30, Occupational Licenses and Registrations, will obtain prior to commencing facility operations.

☒ Class A ☐ Class B

19. Ownership Status of the Facility

☐ Corporation	☒ Limited Partnership	☐ Federal Government
☐ Individual	☐ City Government	☐ Other Government
☐ Sole Proprietorship	☐ County Government	☐ Military
☐ General Partnership	☐ State Government	☐ Other (specify):

Does the Site Operator (Permittee/Registrant) own all the facility units and all the facility property?

☒ Yes ☐ No

If "No", provide the information requested below for any additional ownership.

Owner Name:

Street or P.O. Box:

City: County: State: Zip Code:

(Area Code) Telephone Number:

Email Address (optional):

20. Other Governmental Entities Information

Texas Department of Transportation District: Fort Worth District

District Engineer's Name: **Carl L. Johnson, P.E.**

Street Address or P.O. Box: **2501 SW Loop 820**

City: **Fort Worth** County: **Tarrant** State: **TX** Zip Code: **76133**

(Area Code) Telephone Number: **(817) 370-6514**

E-Mail Address (optional):

The Local Governmental Authority Responsible for Road Maintenance (if applicable): City of Alvarado

Contact Person's Name: **Michael Dwiggins, Public Works Director**

Street Address or P.O. Box: **104 W. College St.**

City: **Alvarado** County: **Johnson** State: **TX** Zip Code: **76009**

(Area Code) Telephone Number: **(817) 879-1246**

E-Mail Address (optional):

City Mayor Information

City Mayor's Name: **Jacob Wheat**

Office Address: **104 W. College**

City: **Alvarado** County: **Johnson** State: **TX** Zip Code: **76009**

(Area Code) Telephone Number: **817-821-9240**

E-Mail Address (optional): **wheatj@cityofalvarado.org**

City Health Authority: See County Health Authority

Contact Person's Name:

Street Address or P.O. Box:

City: County: State: Zip Code:

(Area Code) Telephone Number:

E-Mail Address (optional):

County Judge Information

County Judge's Name: **Roger Harmon**

Street Address or P.O. Box: **2 N. Main St.**

City: **Cleburne** County: **Johnson** State: **TX** Zip Code: **76033**

(Area Code) Telephone Number: **(817) 556-6360**

E-Mail Address (optional): **countyjudge@johnsoncountytx.org**

County Health Authority: Texas Dept. of State Health Services - Regions 2/3

Contact Person's Name: **Becky Earlie-Royer, PhD, MPH, CHES, Deputy Regional Director**

Street Address or P.O. Box: **1301 S. Bowen Rd., Ste. 200**

City: **Arlington** County: **Tarrant** State: **TX** Zip Code: **76013**

(Area Code) Telephone Number: **(817) 264-4500**

E-Mail Address (optional):

State Representative Information

District Number: **58**

State Representative's Name: **DeWayne Burns**

District Office Address: **115 S. Main St., Suite 202**

City: **Cleburne** County: **Johnson** State: **TX** Zip Code: **76033**

(Area Code) Telephone Number: **(817) 645-3685**

E-Mail Address (optional):

State Senator Information

District Number: **22**

State Senator's Name: **Brian Birdwell**

District Office Address: **1315 Waters Edge Dr., Suite 116**

City: **Granbury** County: **Hood** State: **TX** Zip Code: **76048**

(Area Code) Telephone Number: **(817) 573-9622**

E-Mail Address (optional):

Council of Government (COG) Name: North Central Texas Council of Governments

COG Representative's Name: **Edith Marvin**

COG Representative's Title: **Staff Director, Environment and Development**

Street Address or P.O. Box: **616 Six Flags Drive**

City: **Arlington** County: **Tarrant** State: **TX** Zip Code: **76011**

(Area Code) Telephone Number: **(817) 640-3300**

E-Mail Address (optional):

River Basin Authority Name: Trinity River Authority

Contact Person's Name: **J. Kevin War, General Manager**

Watershed Sub-Basin Name: **Chambers Creek (Headwater North Fork)**

Street Address or P.O. Box: **5300 S. Collins**

City: **Arlington** County: **Tarrant** State: **TX** Zip Code: **76018**

(Area Code) Telephone Number: **(817) 467-4343**

E-Mail Address (optional):

Coastal Management Program

Is the facility within the Coastal Management Program boundary?

☐ Yes ☒ No

U.S. Army Corps of Engineers

The facility is located in the following District of the U.S. Army Corps of Engineers:

☐ Albuquerque, NM ☐ Galveston, TX

☒ Ft. Worth, TX ☐ Tulsa, OK

Local Government Jurisdiction

Within City Limits of:

Within Extraterritorial Jurisdiction of: **City of Alvarado**

Is the facility located in an area in which the governing body of the municipality or county has prohibited the storage, processing or disposal of municipal or industrial solid waste?

☐ Yes ☒ No

If "Yes", provide a copy of the ordinance or order as an attachment.

Signature Page

I, Gary Bartels, Southern Region Engineer,
(Site Operator (Permittee/Registrant)'s Authorized Signatory) (Title)

certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: Gary J. Bartels Date: 2-25-2022

TO BE COMPLETED BY THE OPERATOR IF THE APPLICATION IS SIGNED BY AN AUTHORIZED REPRESENTATIVE FOR THE OPERATOR

I, _____, hereby designate _____
(Print or Type Operator Name) (Print or Type Representative Name)

as my representative and hereby authorize said representative to sign any application, submit additional information as may be requested by the Commission; and/or appear for me at any hearing or before the Texas Commission on Environmental Quality in conjunction with this request for a Texas Water Code or Texas Solid Waste Disposal Act permit. I further understand that I am responsible for the contents of this application, for oral statements given by my authorized representative in support of the application, and for compliance with the terms and conditions of any permit which might be issued based upon this application.

_____
Printed or Typed Name of Operator or Principal Executive Officer

_____
Signature

SUBSCRIBED AND SWORN to before me by the said Gary Bartels

On this 25th day of February, 2022

My commission expires on the 17th day of May, 2025

Helen M. Hanson
Notary Public in and for

Tarrant County, Texas

HELEN M. HANSON
Notary Public, State of Texas
Comm. Expires 05-17-2025
Notary ID 10180332

(Note: Application Must Bear Signature & Seal of Notary Public)

Part I Attachments

(See Instructions for P.E. seal requirements.)

Required Attachments	**Attachment No.**
Supplementary Technical Report	**PART I/II**
Property Legal Description	**PART I/II**
Property Metes and Bounds Description	**PART I/II**
Facility Legal Description	**PART I/II**
Facility Metes and Bounds Description	**PART I/II**
Metes and Bounds Drawings	**PART I/II**
On-Site Easements Drawing	**PART I/II**
Land Ownership Map	**PART I/II**
Land Ownership List	**PART I/II**
Electronic List or Mailing Labels	**PART I/II**
Texas Department of Transportation (TxDOT) County Map	**PART I/II**
General Location Map	**PART I/II**
General Topographic Map	**PART I/II**
Verification of Legal Status	**PART I/II**
Property Owner Affidavit	**PART I/II**
Evidence of Competency	**PART I/II**

Additional Attachments as Applicable- Select all those apply and add as necessary

- ☒ TCEQ Core Data Form(s)
- ☒ Signatory Authority Delegation
- ☒ Fee Payment Receipt
- ☐ Confidential Documents
- ☐ Waste Storage, Processing and Disposal Ordinances
- ☒ Final Plat Record of Property
- ☒ Certificate of Fact (Certificate of Incorporation)
- ☐ Assumed Name Certificate

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions regarding completion of 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 601668486		RN 100825462

SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)	2/22/2022

☐ 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:*

Texas Regional Landfill Company, LP

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*
		752826525	

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☒ Limited

Government: ☐ City ☐ County ☐ Federal ☐ 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

☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address: 3 Waterway Square Place, Suite 550

City	The Woodlands	State	TX	ZIP	77380	ZIP + 4	

16. Country Mailing Information *(if outside USA)*	17. E-Mail Address *(if applicable)*
	gary.bartels@wasteconnections.com

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(817) 705-6072		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☐ 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 Agency 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.)*

Turkey Creek Landfill

23. Street Address of the Regulated Entity: *(No PO Boxes)*	9100 S Interstate 35W						
	City	Alvarado	**State**	TX	**ZIP**	76009	**ZIP + 4**
24. County	Johnson						

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	2.5 miles south of Alvarado, Texas, west of and adjacent to the west service road of IH-35W at the Greenfield-Barnsville exit

26. Nearest City	**State**	**Nearest ZIP Code**
Alvarado	TX	76009

27. Latitude (N) In Decimal:	32.3575	**28. Longitude (W) In Decimal:**	-97.203889

Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
32	21	27	-97	12	14

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)
4953		562212	

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

Municipal Solid Waste Disposal

34. Mailing Address:	**3 Waterway Square Place, Suite 550**						
	City	TheWoodlands	**State**	TX	**ZIP**	77380	**ZIP + 4**

35. E-Mail Address:	gary.bartels@wasteconnections.com

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(817) 705-6072		( ) -

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
			JH03985	
☒ Municipal Solid Waste	☒ New Source Review Air	☐ OSSF	☒ Petroleum Storage Tank	☐ PWS
1417D	101354		37433	
☐ Sludge	☒ Storm Water	☒ Title V Air	☐ Tires	☐ Used Oil
	TXRO5AP29	1517		
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☒ Other: Air New Source
				48251000035

SECTION IV: Preparer Information

40. Name:	Nevzat Turan, P.E.	**41. Title:**	Senior Engineer

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(817) 735-9770		(817) 735-9775	nturan@wcgrp.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:	Texas Regional Landfill Company, LP	**Job Title:**	Southern Region Engineer
Name *(In Print):*	Gary Bartels	**Phone:**	(817) 705- **6072**
Signature:	Gary J Bartels	**Date:**	2-25-2022

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

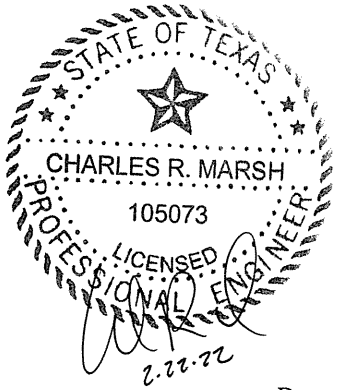
MAJOR PERMIT AMENDMENT APPLICATION

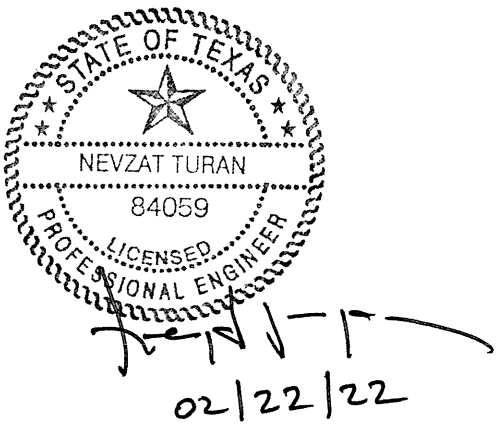
PARTS I/II
GENERAL APPLICATION REQUIREMENTS

Prepared for:

Texas Regional Landfill Company, LP

February 2022





Prepared by:

Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-123

This document intended for permitting purposes only.

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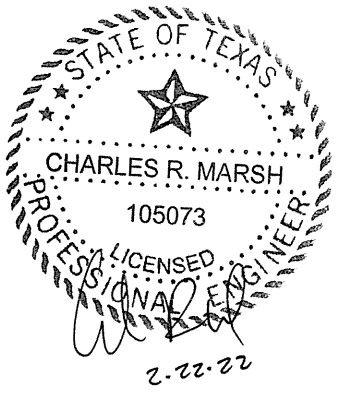

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LIST OF ACRONYMS

BMPs – best management practices

CFR – Code of Federal Regulations

CLOMR – Conditional Letter of Map Revision

CWA – Clean Water Act

EDE – Elevation of Deepest Excavation

EPA – Environmental Protection Agency

ETJ – extra territorial jurisdiction

FAA – Federal Aviation Administration

FEMA – Federal Emergency Management Agency

FIRM – Flood Insurance Rate Map

FML – flexible membrane liner

ft-msl – feet above mean sea level

FWS – U.S. Fish and Wildlife Service

GCCS – gas collection and control system

GLER – Geomembrane Liner Evaluation Report

GWSAP – Groundwater Sampling and Analysis Plan

HDPE – high density polyethylene

LCS – leachate collection system

LF – landfill

LFG – landfill gas

LIST OF ACRONYMNS (Continued)

LLDPE – linear low density polyethylene

LQCP – Liner Quality Control Plan

MSGP – multi-sector general permit

MSW – municipal solid waste

MW – monitoring well

NAVD – North American Vertical Datum

NCTCOG - North Central Texas Council of Governments

NESHAP – National Emissions Standards for Hazardous Air Pollutants

NGVD – National Geodetic Vertical Datum

NFIP – National Flood Insurance Program

NOI – Notice of Intent

NSPS/EG – New Source Performance Standards/Emission Guidelines

NWP – Nationwide Permit

PCBs – polychlorinated biphenyls

PI – point of intersection

POC – point of compliance

POTW – publicly owned treatment works

PSD – Prevention of Significant Deterioration

PVI – point of vertical intersection

QA/QC – quality assurance/quality control

LIST OF ACRONYMNS (Continued)

SDP – Site Development Plan

SLER – Soils and Liner Evaluation Report

SOP – Site Operating Plan

TAC – Texas Administrative Code

TCEQ – Texas Commission on Environmental Quality

TDSHS – Texas Department of State Health Services

THC – Texas Historical Commission

TPDES – Texas Pollutant Discharge Elimination System

TPWD – Texas Parks and Wildlife Department

TWC – Texas Water Commission

TWDB – Texas Water Development Board

TxDOT – Texas Department of Transportation

U.S.DA – U.S. Department of Agriculture

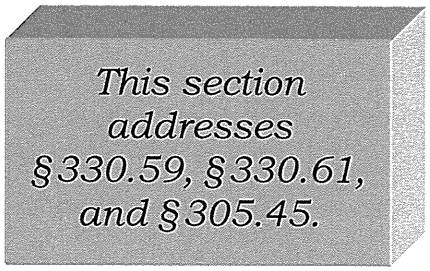
USACE – U.S. Army Corps of Engineers

U.S.GS – U.S. Geological Survey

UIC – Underground Injection Control

WCG – Weaver Consultants Group, LLC

1 INTRODUCTION



The purpose of this Major Permit Amendment is to secure authorization for an expansion of the existing Turkey Creek Landfill, TCEQ Permit No. MSW-1417C. The existing approximately 146.4-acre waste disposal area will be expanded to 172.0 acres (refer to Appendix I/IIC, Section 2 for details). No changes will be made to the permit boundary. The maximum permitted final cover elevation will be increased from 946 ft-mean sea level (ft-msl) to 996 ft msl. The increase in height will decrease the size of the top deck of the landfill. The resulting capacity increase for this amendment is 10.8 million cubic yards (refer to Section 2.1 for a detailed project overview). This landfill expansion will provide for the long term disposal needs of Johnson County and surrounding areas.

The Turkey Creek Landfill has provided for the municipal solid waste (MSW) disposal needs of Johnson County and surrounding areas for approximately 35 years. This major permit amendment will ensure that this critical service will continue for the landfill's service area.

The General Application Requirements section (Parts I/II) of this permit amendment application for the Turkey Creek Landfill has been prepared consistent with the State of Texas requirements set forth in Title 30 Texas Administrative Code (TAC) §330.59, §330.61 and §305.45. Part II has been combined with Part I in accordance with Title 30 TAC §330.57(c)(2). Section 2, Supplementary Technical Report, presents an overview of the project and a detailed facility description as well as the types of waste that will be accepted at the facility. The remaining portions of Parts I/II present information on specific existing conditions on and around the site and regulatory matters related to the application process.

2 SUPPLEMENTARY TECHNICAL REPORT

2.1 Facility Location and Project Overview

Site Location

The Turkey Creek Landfill is an existing Type I municipal solid waste (MSW) facility (TCEQ Permit No. MSW-1417C) in Johnson County. The landfill is located approximately 2.5 miles south of Alvarado, Texas. The site entrance is located off the southbound Interstate Highway 35 West (IH-35W) Frontage Road immediately north of County Road 107. A general site location map is provided on Figure I/II-4.1.

This section addresses §305.45(a)(7), §305.45(a)(8), §330.57(i), §330.59(b), §330.61(b), §330.61(l), §330.61(o), and §330.61(p).

Owner and Operator

The existing landfill is owned and operated by Texas Regional Landfill Company, LP, which is a Delaware limited partnership qualified to do business in Texas. Texas Regional Landfill Company, LP's managing general partner is WCN TX GP Corporation, a subsidiary of Waste Connections Lonestar, Inc. For over 35 years, the landfill has been a part of the community and is the main recipient of waste from the residents and businesses in Johnson County and surrounding areas.

Major Permit Amendment Summary

The purpose of this Major Permit Amendment is to secure authorization to horizontally and vertically expand the existing Turkey Creek Landfill. Comparisons between (1) the existing permitted and proposed landfill completion plans and (2) the existing permitted and proposed excavation plans are shown on Figure I/II-2.1 and Figure I/II-2.2, respectively. As shown, the permit boundary will not be changed and the waste footprint will be expanded to the east and west for this permit amendment. Permit modifications must be submitted to request a change to the MSW permit.

The facility serves residences and businesses in Johnson County and surrounding communities. In addition, the landfill accepts waste from municipal, private, and public haulers from surrounding communities and counties. This service area is based on current economic conditions. As economic conditions and available landfill disposal capacity change, the landfill may accept waste from areas other than those identified above.

The quantity and types of waste accepted at the landfill and the site design and operations are discussed in the following subsections. Consistent with Title 30 TAC §330.61(b), the sources and characteristics of wastes are detailed in the following sections. In addition, waste screening and acceptance procedures are further discussed in Part IV – SOP. The types of waste to be accepted for disposal per TCEQ Permit No. MSW-1417D will be the same as those currently accepted at the site.

2.1.1 Waste Acceptance Plan

The Turkey Creek Landfill is currently operated as a Type I municipal solid waste disposal facility. The facility accepts waste for disposal from both public and private entities in and around Johnson County and surrounding counties. The proposed expansion of the site will not alter the current service area of the site. The design and operation of the facility considers the characteristics of the waste types discussed in this section.

The major classifications of solid waste to be accepted at the Turkey Creek Landfill include municipal solid waste, household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes. Each classification of waste is defined by Title 30 TAC §330.3 as follows (note that not all of the special wastes listed in §330.3(148) will be accepted at this site – refer to Part IV – Site Operating Plan for additional information):

- **Municipal Solid Waste:** Solid waste resulting from or incidental to municipal, community, commercial, institutional, and recreational activities, including garbage, rubbish, ashes, street cleanings, dead animals, abandoned automobiles, and all other solid waste other than industrial solid waste.
- **Household Waste:** Any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels, motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas); does not include brush.
- **Yard Waste:** Leaves, grass clippings, yard and garden debris, and brush, including clean woody vegetative material not greater than 6 inches in diameter, that results from landscaping maintenance and land-clearing operations. The term does not include stumps, roots, or shrubs with intact root balls.

- **Commercial Solid Waste:** All types of solid waste generated by stores, offices, restaurants, warehouses, and other non-manufacturing activities, excluding residential and industrial wastes.
- **Industrial Waste (Nonhazardous):** Solid waste resulting from or incidental to any process of industry or manufacturing, or mining or agricultural operations, classified as follows:
  - Class 1 Non-hazardous Industrial Solid Waste – any industrial solid waste or mixture of industrial solid wastes that because of its concentration or physical or chemical characteristics is toxic, corrosive, flammable, a strong sensitizer or irritant, a generator of sudden pressure by decomposition, heat, or other means, and may pose a substantial present or potential danger to human health or the environment when improperly processed, stored, transported, or disposed of or otherwise managed, as further defined in Title 30 TAC §335.505 (relating to Class 1 Waste Determination).

    Class 2 Industrial Solid Waste – any individual solid waste or combination of industrial solid waste that are not described as Nonhazardous Class 1 or Class 3 as defined in Title 30 TAC §335.506 (relating to Class 2 Waste Determination).
  - Class 3 Industrial Solid Waste – inert and essentially insoluble industrial solid waste, usually including, but not limited to, materials such as rock, brick, glass, dirt, and certain plastics and rubber, etc., that are not readily decomposable, as further defined in Title 30 TAC §335.507 (relating to Class 3 Waste Determination).
- **Construction-Demolition Waste:** Waste resulting from construction or demolition projects; includes all materials that are directly or indirectly the by-products of construction work or that result from demolition of buildings and other structures, including but not limited to, paper, cartons, gypsum board, wood, excelsior, rubber, and plastics.
- **Special Waste:** Any solid waste or combination of solid wastes that because of its quantity, concentration, physical or chemical characteristics, or biological properties requires special handling and disposal to protect human health or the environment. If improperly handled, transported, stored, processed, or disposed of or otherwise managed, it may pose a present or potential danger to human health or the environment. Refer to Part IV of the application for additional information regarding the acceptance of special waste.

As noted above, the site has been designed to accept Class 1 waste in certain areas (as detailed in Part III, Section 4.3.6 of the Site Development Plan Narrative and Appendix IIIA). The area dedicated for Class 1 non-hazardous industrial solid waste will be lined with a composite liner system consisting of a 60-mil HDPE

geomembrane liner overlying a 3-foot-thick compacted clay soil liner with a hydraulic conductivity of no more than $1x10^{-7}$ cm/s. As shown on Drawings A.8 and A.9 in Part III, Appendix IIIA-A and summarized below, there are two currently permitted Class 1 waste disposal area fill options.

- Above Grade Class 1 Waste Fill with Perimeter Berm/Containment Dike and Operational Step Dikes. As shown on Drawing A.8 in Part III, Appendix IIIA-A, this option allows for the disposal of Class 1 wastes above existing grade if operational step dikes are constructed along the exterior slope of the Class 1 waste disposal area. As shown on Drawing A.8 in Part III, Appendix IIIA-A, the thickness of the composite final cover system's infiltration layer, for the area below the separation layer, will be increased from 1.5 feet to 4.0 feet with a maximum hydraulic conductivity of $1x10^{-7}$ cm/s.
- Above Grade Class 1 Fill with Perimeter Berm/Containment Dike and Soil Cover System. As shown on Drawing A.9 in Part III, Appendix IIIA-A, this option allows for the disposal of Class 1 waste above existing grade by utilizing a 4.5-foot-thick cover soil layer that will be placed on the exterior sideslopes, extending from the top of the perimeter berm/containment dike (or previously constructed operational step dike). The soil cover layer will also be placed on the top slope of the Class 1 disposal areas when they are filled to final grade. The final cover will be constructed by stripping the upper 3.5 feet from the soil cover layer and constructing a final cover in compliance with Title 30 TAC §335.590(24)(E) containing a 4-foot-thick infiltration layer with a maximum hydraulic conductivity of $1x10^{-7}$ cm/s.

Consistent with Title 30 TAC §330.15, the facility will not accept for disposal liquid waste, regulated hazardous waste, prohibited PCBs, infectious medical waste, and other wastes prohibited by TCEQ regulations.

Class 1 industrial waste in excess of 20% of the total amount of waste may not be accepted in accordance with Title 30 TAC §330.173(e).

Non-Class 1 waste may also be disposed of in the Class 1 waste disposal area for each option listed above. Refer to Part III, Appendix IIIA, Section 6.0 for more information.

Liquid wastes may be accepted at the Liquid Waste Solidification Facility (refer to Figure I/II-3.1 for existing location of the Liquid Waste Solidification Facility). The liquid wastes will be solidified with bulking agents before disposal within the landfill (refer to Part IV, Appendix IVE for additional information).

Waste will only be disposed of in the 172.0-acre solid waste disposal footprint described in this permit application. No other waste disposal activities will occur within the 219.6-acre Turkey Creek Landfill permit boundary.

2.1.2 Disposal Rate and Volume of Waste

The following two subsections detail the volume of waste disposal capacity and the projected disposal rates.

Volume of Waste Disposal Capacity

The waste disposal capacity of the site is summarized in Table 2-1.

Table 2-1
Waste Disposal Capacity Summary

Item	Disposal Capacity[1]	
	Permit No. MSW-1417C	Permit No. MSW-1417D
Consumed Airspace	16,824,077	16,824,077
Remaining Airspace	10,075,923	20,875,923
Airspace Gained by Expansion	---	10,800,000
Total Capacity	**26,900,000**	**37,700,000**

[1] Disposal capacity is defined as waste and daily cover. The consumed airspace represents the waste that has been placed at the site as of January 2021.

Disposal Rate Projections

The disposal rate estimate is based on Texas Regional Landfill Company, LP's knowledge of market conditions, both currently and after the permit is issued.

The disposal rate projections are discussed in detail in Appendix IIIN and summarized in Table 2-2.

Table 2-2
Solid Waste Disposal Rate Summary

Initial Waste Inflow	Average Daily Projected Waste Inflow	Maximum Projected Waste Inflow	Population Equivalent (persons)	Site Life[1] (years)
899,000 tons/year 3,143 tons/day	1,108,822 tons/year 3,877 tons/day	1,221,321 tons/year 4,270 tons/day	1,215,147	12.9

[1] Based on the site projected to receive 3,497 tons/day (based on a 286-day operating schedule) in 2022.

Texas Regional Landfill Company, LP estimates that the waste inflow will increase to 1,000,000 tons per year (3,497 tons per day based on a 286-day operating schedule) in 2022. This increase is due to the proposed closure of the Weatherford Landfill and additional waste intake from Dallas. After 2022, the waste inflow rate is assumed to increase consistent with the projected growth rate for the facility's general service area.

Operating criteria for a range of waste acceptance rates are included in Part IV – SOP. The above projections are based on current market conditions and may vary as market conditions change. These waste acceptance rates are not a limiting parameter of this permit. The actual yearly waste acceptance rate is a rolling quantity based on the sum of the previous four quarters of waste acceptance (refer to Part IV – SOP for additional information).

The estimated maximum annual waste acceptance rate for the facility for 7 years is shown in the following table.

Year	Waste Acceptance Rate (tons per year)
2021	899,000
2022	1,000,000
2023	1,054,133
2024	1,070,496
2025	1,087,113
2026	1,103,988
2027	1,121,125

The projected waste acceptance rate for other years is summarized in Part III, Appendix IIIN.

2.1.3 Solid Waste Containment System

The design objective of the containment system [final cover, Subtitle D liner, pre-Subtitle D liner (overliner), and leachate management systems] is to isolate the solid waste and remove leachate (defined as a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste) that may collect on the liner system. The Subtitle D liner system proposed for the landfill consists of a composite liner (compacted clay, 60-mil HDPE geomembrane liner, and drainage geocomposite). The overliner system that will separate the existing waste in the pre-Subtitle D waste disposal area and the expansion disposal area will consist of a 2-foot compacted clay liner (or a geosynthetic clay liner), 40-mil LLDPE geomembrane liner and a drainage geocomposite layer. A generalized detail of the containment system for the Turkey Creek Landfill is shown in Figure 2.1 on page I/II-2-6. The containment system is

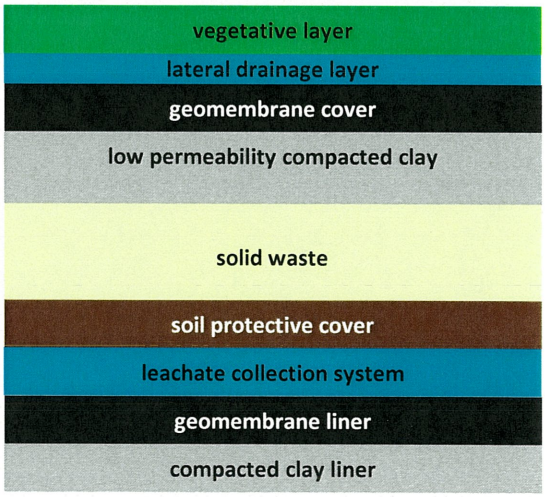


Figure 2.1. The composite liner and cover systems will be designed to meet or exceed all state and federal regulations.

described only for the MSW disposal areas. Refer to Part III, Appendix IIIA, Section 6 for the description of the extent of the Class 1 waste disposal area and the Class 1 waste containment system. Design information and the required QA/QC construction procedures for the individual components of the containment system are presented in Part III of this application.

2.1.4 Site Development Plan

The site development plan (SDP) is included in Part III of this application. This plan sets forth the overall design and operating characteristics of the landfill. Drawings showing the proposed landfill configuration during site development are presented in Parts I/II, Appendix I/IIA – Facility Layout Maps. A summary of the landfill configuration is provided below (refer to Figures I/II-2.1 and I/II-2.2 for additional information).

- The proposed permit boundary will include an area of 219.6 acres. No increase in the size or configuration of the permit boundary are proposed for this amendment application. The legal description for the permit boundary is included in Section 13 of Parts I/II.
- A summary of the capacity (volume of waste and cover soils) of the site is listed below:
  - Remaining capacity of existing site (TCEQ Permit No. MSW-1417C) =10.1 million cubic yards (as of January 8, 2021).
  - Increase due to major permit amendment application = 10.8 million cubic yards.
  - Remaining capacity of the site with the proposed expansion (TCEQ Permit No. MSW-1417D) = 20.9 million cubic yards (as of January 8, 2021). Of the total volume available for solid waste and daily cover, approximately 8.2 million cubic yards is available for Class 1 waste. Non-Class 1 waste may also be disposed of in this area.
- The maximum elevation of the final cover will be 996 ft-msl, and the maximum waste elevation will be 992.5 ft-msl.
- The elevation of deepest excavation (EDE) for the proposed landfill liner system excavation will be 648 ft-msl (i.e., bottom of liner system in deepest sump), which is the same as the currently approved EDE. This elevation represents the bottom of the liner system.
- A Subtitle D composite liner (2-foot-thick (3-foot for Class 1 areas) compacted clay liner overlain by a 60-mil HDPE geomembrane liner) and leachate collection system will be constructed according to Title 30 TAC §330.331(a)(2) and §330.333. Details for the liner and LCS are provided in Part III, Appendix IIIA-A – Liner, Overliner, and Final Cover System Details.

- This application includes a vertical expansion over the pre-Subtitle portion of the landfill. A containment system design for this area is provided to meet the requirements of Title 30 TAC §330.331(a)(2). The composite overliner system consists of a 2-foot thick clay liner (or a geosynthetic clay liner) overlain by a 40-mil LLDPE geomembrane, a drainage geocomposite leachate collection layer, and a 2-foot-thick protective layer. Details for the overliner system are provided in Part III, Appendix IIIA – Landfill Unit Design Information. The point of compliance demonstration is provided in Part III, Appendix IIIB.
- Above grade waste disposal will conform to the lines and grades set forth in Appendix I/IIA, Drawing I/II-A.8 – Landfill Completion Plan. Sideslope grades will not exceed 3.5H:1V from the toe of the side embankment to the top of the side embankment. The slope of the landfill top deck will be constructed at a six percent maximum slope.
- A final cover system will be constructed over the filled waste material, as shown in Part III, Appendix IIIA-A – Liner, Overliner, and Final Cover System Details. The final cover system is designed to minimize stormwater infiltration.
- The proposed expansion includes numerous drainage improvements to the existing permitted drainage system design. The final cover erosion control structures and perimeter channel system have been designed to effectively minimize erosion of final cover soils and increase detention of stormwater before it is discharged from the site. The proposed perimeter drainage system includes detention ponds, channels, and outlet control structures. The perimeter drainage system will be constructed in the general sequence shown in Parts I/II, Appendix I/IIA, Drawings I/II-A.4 through I/II-A.7.
- The site currently operates an existing liquid waste solidification facility. The existing solidification facility contains four concrete pits and is located in the southern portion of the site. The existing facility has been in operation since 2013. The existing solidification facility will continue to be used after the issuance of Permit No. 1417D. The facility will need to be relocated as needed to permit the development of the landfill footprint. Prior to relocating the facility, a permit modification will be submitted to TCEQ. Generalized construction details and a Liquid Waste Solidification Facility Operating Plan are included in Part IV, Appendix IVE. Additional liquid waste solidification units/processes may be used as outlined in Appendix IVE.

2.1.5 Site Monitoring Systems

To verify the integrity of the environmental protection systems, the following existing monitoring systems will be maintained.

- **Groundwater Monitoring System** – The purpose of the groundwater monitoring system is to verify the integrity of the containment systems and to confirm that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining groundwater samples from the monitoring wells on the perimeter of the landfill, which are screened in the uppermost aquifer. Appendix IIIH includes the details of the existing groundwater monitoring system.

  The existing groundwater monitoring system (TCEQ Permit No. 1417C) consists of 18 detection monitoring wells, including two upgradient background wells and 16 downgradient point of compliance wells. This major amendment application proposes revisions to the groundwater monitoring system that include the installation of additional wells and decommissioning of some of the existing wells to accommodate the phased development of the facility's proposed lateral waste disposal expansion areas. The proposed groundwater monitoring system network is further discussed in Part III, Appendix III H.

- **Landfill Gas Monitoring System** – The purpose of the landfill gas monitoring system is to monitor and verify that landfill gas does not migrate off-site. The existing approved landfill gas monitoring system consists of thirteen gas probes located along the existing permit boundary. The landfill gas monitoring system is discussed more in Part III, Appendix III I.

- **Surface Water Monitoring Requirements** – The Turkey Creek Landfill is subject to TCEQ stormwater permit requirements. Turkey Creek Landfill has secured coverage under the Texas Pollutant Discharge Elimination System (TPDES) general permit. Texas Regional Landfill Company, LP maintains a current stormwater pollution prevention plan prepared consistent with multi-sector general permit (TXR05AP29). TCEQ approval for the existing TPDES is included in Appendix I/IIE. Surface water monitoring will be conducted consistent with TPDES requirements.

2.1.6 Site Operations

The Turkey Creek Landfill is now and will continue to be operated by trained and TCEQ-certified personnel. The site operating plan (SOP) for the Turkey Creek Landfill is presented in Part IV of this permit application. The operating plan details, the equipment, personnel, and safety procedures required to operate the site in accordance with Title 30 TAC §330.65. At the end of each working day, the active landfill area will be covered with soil or an approved ADC to prevent potential nuisance conditions such as odors and vectors. The Turkey Creek Landfill will continue to be inspected by the TCEQ on a regular basis for compliance with state regulations.

2.2 Regulatory Agency Coordination

Documentation of coordination with the following regulatory agencies is included in Appendix I/IIB:

- Federal Aviation Administration
- Texas Historical Commission
- Texas Department of Transportation
- Texas Parks and Wildlife Department
- U.S. Army Corps of Engineers
- U.S. Department of the Interior, Fish and Wildlife Service
- North Central Texas Council of Governments

2.3 Texas Historical Commission Review

As noted in Section 2.2, a Texas Historical Commission (THC) coordination letter is included in Appendix I/IIB. THC response will be submitted to TCEQ upon receipt.

2.4 North Central Texas Council of Governments

The expansion of the Turkey Creek Landfill is consistent with the North Central Texas Council of Governments' (NCTCOG) Regional Solid Waste Plan. The Turkey Creek Landfill is identified as a key part of the NCTCOG Regional Solid Waste Plan. The continued development of the facility will provide a regional facility that will ensure long-term, cost-effective, and environmentally-suitable disposal capacity for the region. This is a major goal of the NCTCOG Regional Plan. Parts I/II of this application were submitted to the NCTCOG on February 22, 2022. A letter documenting that Parts I/II were submitted to the NCTCOG is included in Appendix I/IIB. The NCTCOG found the application to be consistent with the goals of the Regional Management Plan. NCTCOG letter is included in Appendix I/IIB.

2.5 Abandoned Oil and Water Wells

An August 2021 search for water wells within a one-mile radius of the site conducted by GeoSearch and WCG included review of records from the Texas Water Development Board, the TCEQ, and other database records (refer to Appendix IIIG of Part III for more information). One facility water well exist within the permit boundary onsite which provides water to Turkey Creek Landfill (see Figure I/II-4.3 for location). The other identified water wells are located outside of the permit

boundary. In addition to the database record searches, WCG completed a reconnaissance survey from area roadways to identify apparently unregistered water wells. No apparent unregistered water wells were identified.

At the time of this submittal, there are no known abandoned onsite oil, gas, or water wells documented within the RRC, SSDRD, TCEQ, and TWBD plugged well databases. However, if an abandoned oil, gas, or water well is located during the course of facility development, the Landfill Manager will provide written notification to the TCEQ's Executive Director of their location within 30 days after discovery during the course of facility development. As the site is developed, if any wells are encountered, they will be exposed, the casing cut to a minimum of 2 feet below the excavation, and the well capped and plugged in accordance with all applicable rules and regulations of the TCEQ, the Railroad Commission of Texas, or other applicable state agency.

The Landfill Manager will provide written notification to the Executive Director of the location of any existing or abandoned water wells within the facility upon discovery during site development. Within 30 days of such a discovery, the Landfill Manager will provide written notification and certification to the Executive Director of the TCEQ that all such wells have been capped, plugged, and closed in accordance with all applicable rules and regulations of the TCEQ or other applicable state agency.

For crude oil or natural gas wells, or other wells associated with mineral recovery that are under the jurisdiction of the Railroad Commission of Texas, within 30 days after the plugging of any such well, the Landfill Manager will provide the Executive Director of the TCEQ with written certification that all such wells have been properly capped, plugged, and closed in accordance with all applicable rules and regulations of the Railroad Commission of Texas.

A copy of the well plugging report to be submitted to the appropriate state agency will also be submitted to the executive director of the TCEQ within 30 days after the well has been plugged.

In the event that an abandoned well causes a change to the liner installation plan, a permit modification will be submitted to the Executive Director in accordance with Title 30 TAC §330.131(d).

2.6 Internet Posting

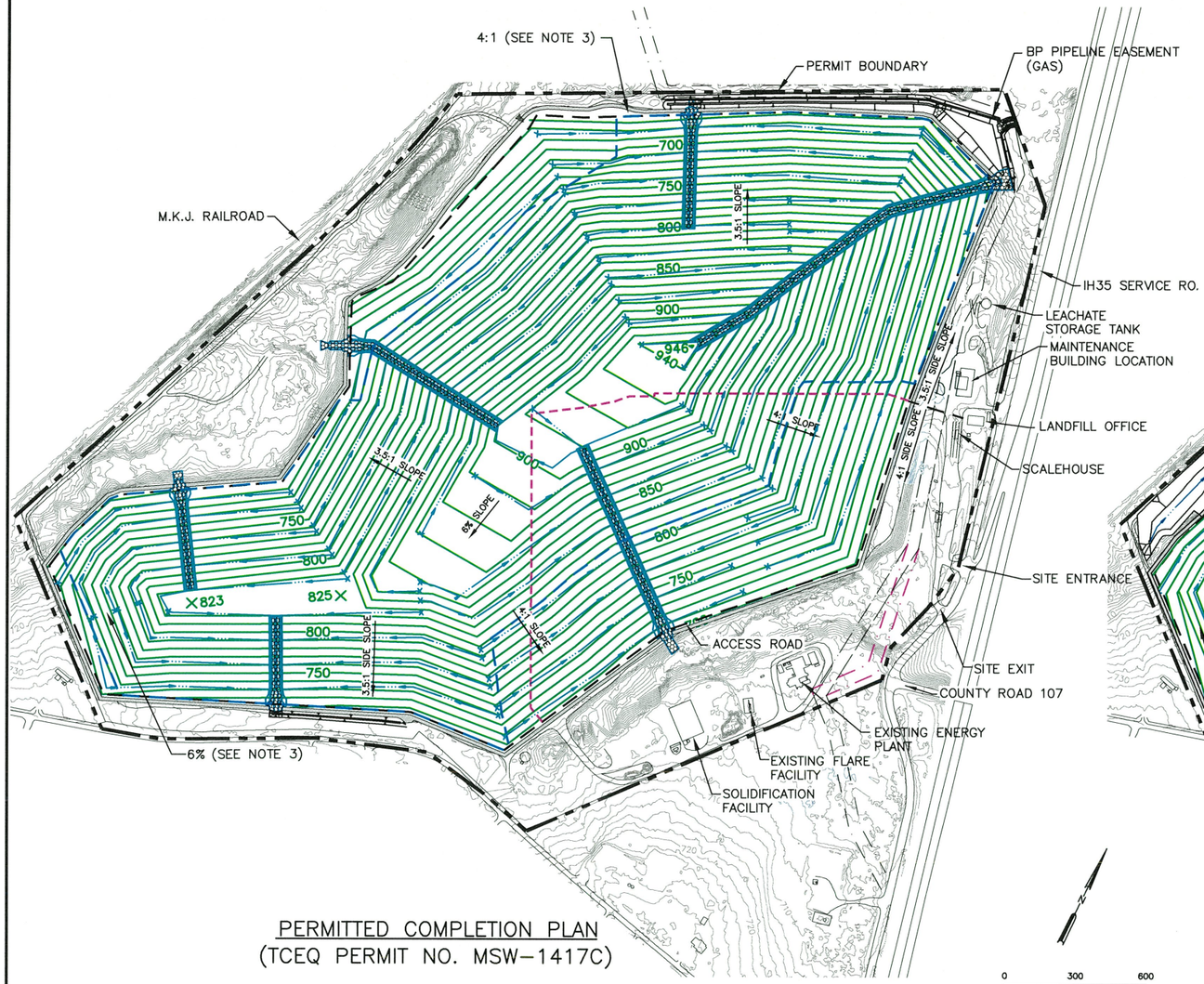
In accordance with Title 30 TAC §330.57(i), a complete copy of this permit application will be posted to the internet at the following publicly accessible website: http://www.ftwweaverboos.com. All future revisions or supplements to this permit application will also be posted at the same location. This internet posting is for informational purposes only.

2.7 Existing Permits/Authorizations

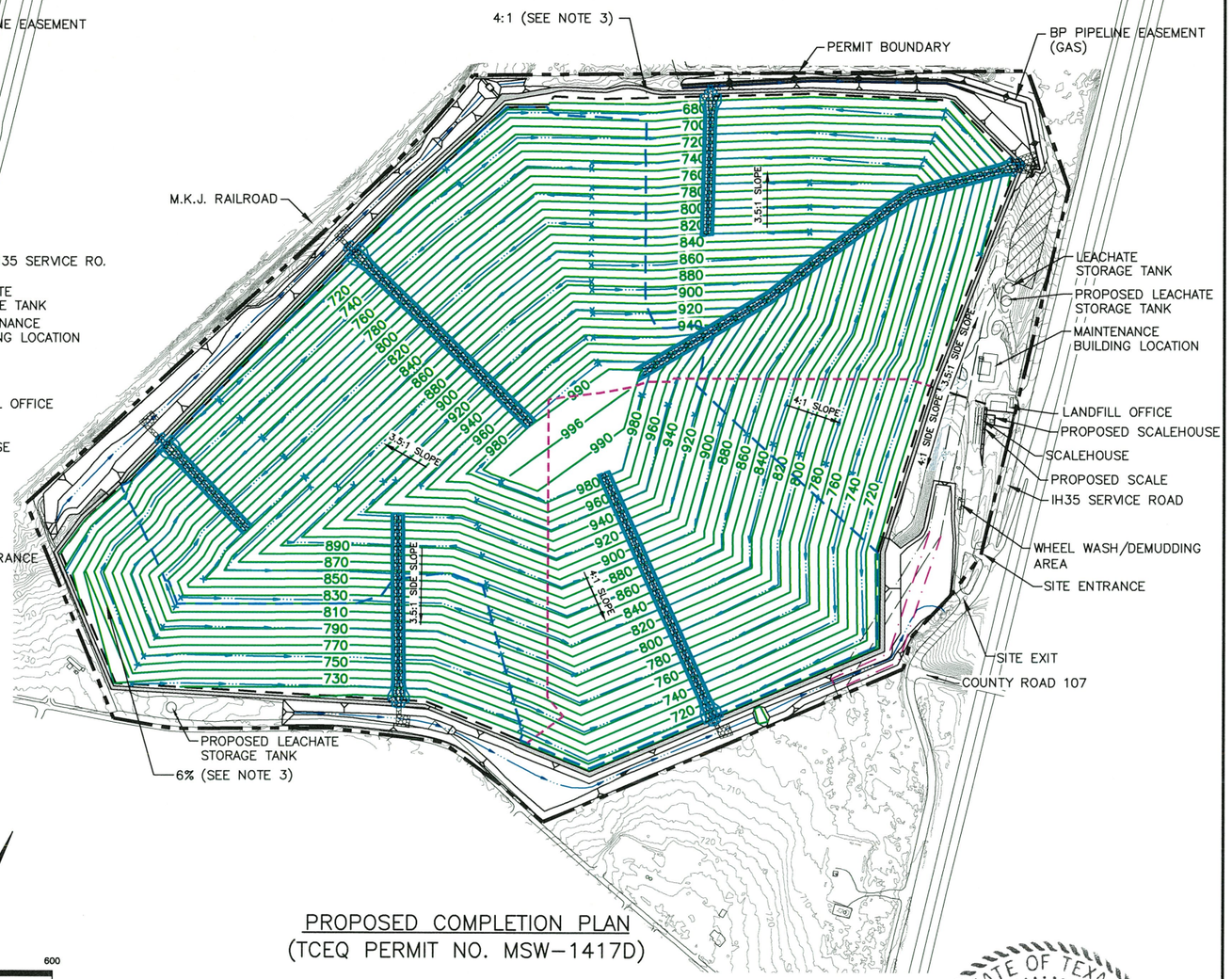
In accordance with Title 30 TAC §305.45(a)(7), the existing permits and authorizations for the facility are summarized in Table 2-3.

Table 2-3
Existing Permits/Authorizations

Description		Status
Hazardous Waste Management program under the Texas Solid Waste Disposal Act		No submittal is required nor has been applied for under the Hazardous Waste Management Program under the Texas Solid Waste Disposal Act.
Underground Injection Control (UIC) program under the Texas Injection Well Act		No submittal is required nor has been applied for under the Underground Injection Control Program under the Texas Injection Well Act.
Texas Pollutant Discharge Elimination System (TPDES) program under the Federal Clean Water Act (CWA) and Waste Discharge program under the Texas Water Code, Chapter 26		Refer to Appendix I/IIE for more information regarding the site's Multi-Sector Stormwater Permit (TCEQ Permit No. TXR05AP29).
Prevention of Significant Deterioration (PSD) Program under the Federal Clean Air Act		No submittal for a Prevention of Significant Deterioration Program under the Federal Clean Air Act (FCAA) is required or has been applied for.
Nonattainment Program under the Federal Clean Air Act (FCAA)		No submittal for a non-attainment permit under the FCAA is required or has been applied for.
National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the FCAA		No submittal is required nor been applied for under the NESHAPS preconstruction approval under the FCAA.
Ocean dumping permits under the Marine Protection Research and Sanctuaries Act		No submittal is required nor have ocean dumping permits been applied for under the Marine Protection Research and Sanctuaries Act.
Dredge or fill permits under the Federal Clean Water Act		No dredge permits are required under the Federal Clean Water Act. Refer to Parts I/II – Section 11 for additional information.
TCEQ Air Quality Permit or Registration		The emission sources at the landfill are currently authorized by 30 TAC §330, Subchapter U Air Standard Permit, No. 101354 issued February 16, 2017. In addition, the landfill is authorized by a Title V General Operating Permit (Permit No. O-01517) issued on December 21, 2017. The Title V Permit and air authorizations will be updated and revised, as needed.
Other Environmental Permits	Petroleum Storage Tank Registration	ID Type: Registration; ID Number: 37433; ID Status: Active



PERMITTED COMPLETION PLAN
(TCEQ PERMIT NO. MSW-1417C)



PROPOSED COMPLETION PLAN
(TCEQ PERMIT NO. MSW-1417D)

0 300 600
SCALE IN FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK AERIAL SURVEYS FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. PERMITTED COMPLETION PLAN FINAL COVER CONTOURS OBTAINED FROM TURKEY CREEK LANDFILL PERMIT NO. 1417C.
3. FINAL COVER SIDE SLOPES BETWEEN THE EXISTING AND NEWLY PERMITTED LIMITS OF WASTE LINES ARE KEPT AS PERMITTED. (I.E., NO EXPANSION ADDITIONAL WASTE FILL OVER THESE AREAS.
4. THE PROPOSED EASEMENT SHOWN IS FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE (SEE NOTE 3)
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE (SEE NOTE 3)
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 4)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- FUTURE LFGTE FACILITY LOCATION

STATE OF TEXAS
CHARLES R. MARSH
105073
PROFESSIONAL ENGINEER
LICENSED
2-22-22

☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 02/2022
FILE: 0771-368-11
CAD: 2.1-FINAL COVER COMPARISON.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE I/II-2.1

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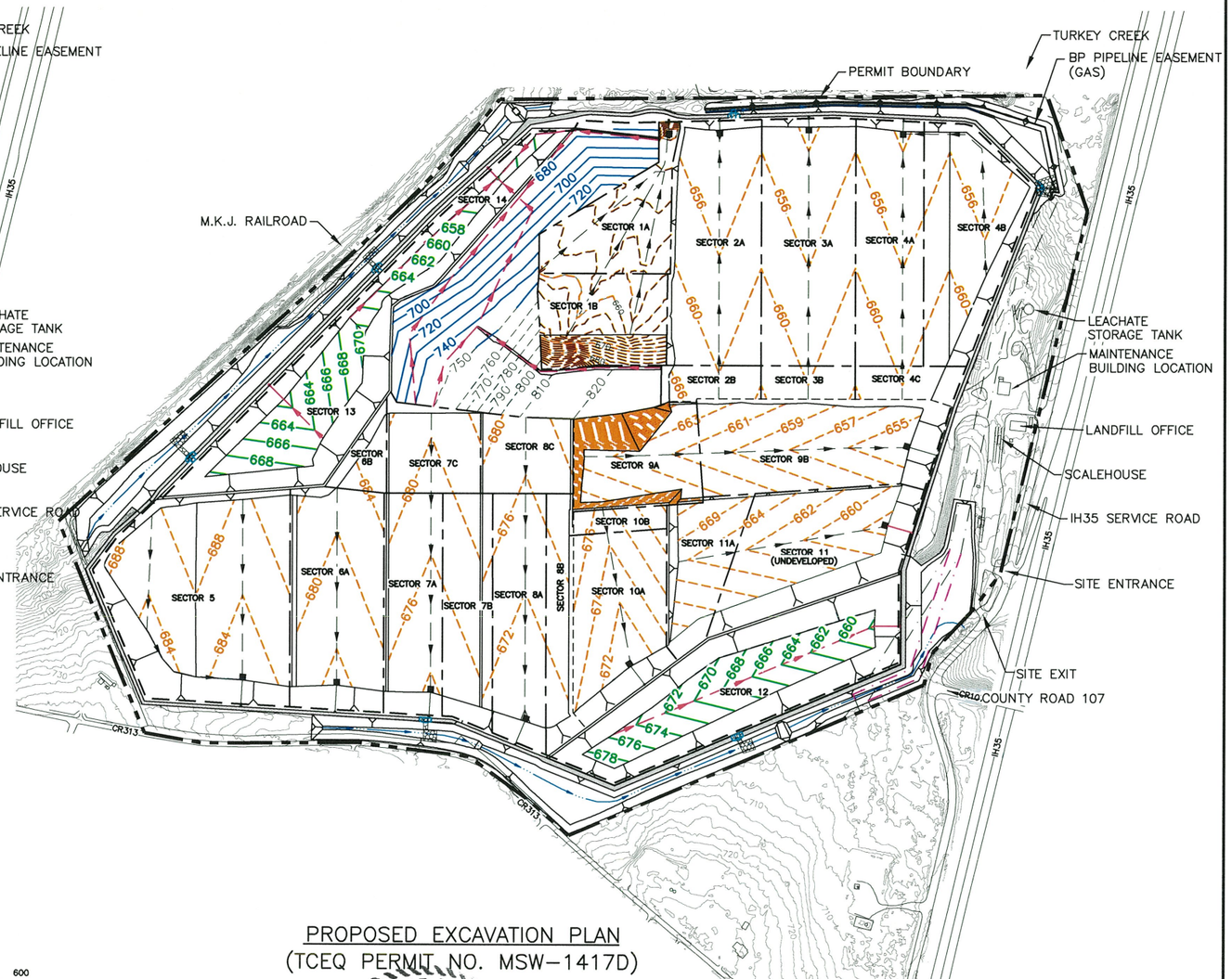
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 2.1-COMPLETION PLAN COMPARISON.dwg, rarrington, 1:2



PERMITTED EXCAVATION PLAN
(TCEQ PERMIT NO. MSW-1417C)



PROPOSED EXCAVATION PLAN
(TCEQ PERMIT NO. MSW-1417D)

0 300 600
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 3)
- SECTOR BOUNDARY
- 820 TOP OF OVERLINER CONTOUR
- 670 PERMITTED EXCAVATION CONTOUR
- 662 PROPOSED EXCAVATION CONTOUR
- PERMITTED LEACHATE LINE
- PROPOSED LEACHATE LINE
- PERMITTED SUMP
- PROPOSED SUMP

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK AERIAL SURVEYS FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. PERMITTED EXCAVATION CONTOURS OBTAINED FROM TURKEY CREEK LANDFILL PERMIT NO. 1417C. THE ELEVATION OF DEEPEST EXCAVATION (EDE) OF 648 FT-MSL WILL NOT CHANGE.
3. THE PROPOSED EASEMENT SHOWN IS FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED
PROFESSIONAL ENGINEER
2.22.22

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 02/2022
FILE: 0771-368-11
CAD: 2.2-EXCAVATION COMPARISON.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT EXISTING AND PROPOSED LANDFILL EXCAVATION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE I/II-2.2

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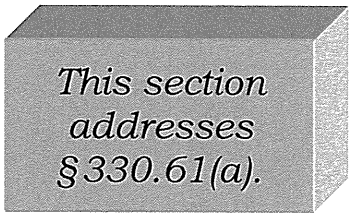
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 2.2-EXCAVATION PLAN COMPARISON.dwg, rarrington, 1:2

3 EXISTING CONDITIONS SUMMARY

3.1 Site History



The Turkey Creek Landfill is an existing 219.6-acre municipal solid waste (MSW) landfill (TCEQ Permit No. MSW-1417C) located approximately 2.5 miles south of the City of Alvarado in Johnson County, Texas.

The site was originally permitted as a 91-acre Type I MSW disposal facility in 1983 (Permit No. MSW-1417). A permit amendment (MSW-1417A) was issued in 1988 which did not add acreage, but made more efficient use of the permitted area. The permit was again amended in 1991 to include an expansion (Permit No. MSW-1417B). TCEQ Permit No. MSW-1417C was issued in 2020 to vertically expand the landfill. The current permit boundary size is 219.6 acres and the currently permitted waste disposal footprint is approximately 146.4 acres. An existing site plan is shown on Figure I/II-3.1. The existing permitted (TCEQ Permit No. MSW-1417C) excavation plan and final contour plan are reproduced in Figures I/II-3.2 and I/II-3.3.

3.2 Existing Liner System

The filled areas of the existing landfill were constructed consistent with the permit requirements in effect at that time. The existing site consists of approximately 15.8 acres of pre-Subtitle D area and 130.6 acres of Subtitle D lined area. The existing liner systems are discussed below, as well as the existing leachate collection and storage systems.

3.2.1 Pre-Subtitle D Area

Figure I/II-3.1 shows the location of the pre-Subtitle D area. The pre-Subtitle D area was developed by excavating to the permitted grade and installing a 3-foot compacted clay liner, consistent with the permit requirements of Permit No. MSW-1417.

3.2.2 Subtitle D Lined Area

Sectors 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 4C, 5, 6A, 6B, 7A, 7B, 7C, 8A, 8B, 8C, 9A, 9B, 10A, and 10B were constructed to Subtitle D standards under Permit No. MSW-1417B. Sectors 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 4C, 5, 6A, 6B, 7A, 7B, 7C, 8A, 8B, 8C, have a liner system consisting of 2 feet of compacted clay liner, 60-mil HDPE geomembrane, drainage geocomposite, and a protective cover layer.

Sectors 9A, 9B, 10A, 10B, and 11A have been constructed, and future Section 11 will be developed as Class 1 waste disposal areas and have a liner system consisting of 3 feet of compacted clay liner, 60-mil HDPE geomembrane liner, drainage geocomposite, and a protective cover layer.

3.2.3 Existing Leachate Collection System

The existing leachate collection systems for the Subtitle D lined areas consist of a geocomposite (single-sided on the floor grades and double-sided on the sideslopes) placed over 1 foot of tire chips and 1 foot of general fill. The leachate collection layer slopes to drain toward perforated leachate collection pipes surrounded by drainage stone. The leachate collection pipes convey leachate to the leachate sumps. Leachate from the leachate collection sumps is pumped via a leachate forcemain to one of two existing leachate storage tanks.

3.3 Groundwater Monitoring System

The existing Subtitle D groundwater monitoring system was approved by the TCEQ as part of a Major Permit Amendment for TCEQ permit No. 1417C. The site is monitored by 18 monitoring wells which include two upgradient background wells (MW-17 and MW-18) and 16 downgradient point of compliance wells (MW-3B, MW-7, MW-9, MW-13, MW-15, MW-19, MW-20, MW-21, MW-26, MW-27, MW-28, MW-29, MW-30, MW-31, MW-32, and MW-33).

The screened intervals of the monitoring wells is based on the technical demonstration submitted as part of the 2008 well spacing permit modification and was designed to optimize detection of a potential release from the landfill unit. All wells monitor the uppermost aquifer. This permit amendment proposes revisions to the groundwater monitoring system that include the installation of additional wells and decommissioning of existing wells to accommodate the phased development of the facility's proposed lateral waste disposal expansion areas. The proposed groundwater monitoring system network is further discussed in Part III, Appendix IIIH. At the time of this submittal all wells are in detection monitoring status and there are no monitoring wells in assessment or corrective action monitoring status. The groundwater monitoring system is further discussed in Appendix IIIH and Appendix IIIG of Part III.

3.4 Landfill Gas Monitoring System

The existing, TCEQ-approved landfill gas monitoring system consists of thirteen gas probes located along the permit boundary. Monitoring of these probes is conducted quarterly. As shown on Figure I/II-3.5, the site currently has a landfill gas collection and control system (GCCS), which includes vertical LFG extraction wells, a piping network, condensate management system, and a blower/flare facility. The gas collection piping system conveys the extracted LFG from the collection points to the flare facility. Additionally, a Type I X-registered facility, operated by Turkey Creek Renewables, LLC, is located on the east side of the permit boundary.

3.5 Existing Landfill Air Permits

The site currently has a Title V Operating Permit approved on December 21, 2017, Permit No. O-01517 and a New Source Review Permit (Permit No. 101354).

3.6 Liquid Waste Solidification Facility

The existing liquid waste solidification facility accepts sludges; septic waste; grease and grit trap wastes; Class 1, 2, and 3 nonhazardous industrial wastes; Railroad Commission wastes; and other nonhazardous bulk liquids for solidification. Once solidified, the waste is transported to the working face for disposal. Generalized construction details of the existing Liquid Waste Solidification Facility Operating Plan are included in Part IV, Appendix IVE.



0 200 400
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- 32° 21' 20" GEODETIC COORDINATE
- EASEMENT
- SECTOR BOUNDARY
- EXISTING SUBTITLE D COMPOSITE LINED AREA
- MW-7 PERMITTED GROUNDWATER MONITORING WELL
- GMP-12 PERMITTED GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.

LINER TYPE BREAKDOWN	
LINER AREA	ACREAGE
PRE-SUBTITLE D	15.8 (SEE NOTE 1)
OVERLINER	9.1
SUBTITLE D MSW	96.9
SUBTITLE D CLASS 1	33.7
TOTAL	146.4

1. A PORTION OF THE PRE-SUBTITLE D AREA WILL RECEIVE OVERLINER.

STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED
PROFESSIONAL ENGINEER
2.22.22

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DATE: 02/2022
FILE: 0771-368-11
CAD: 3.1-EXISTING SITE PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBP
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MAJOR PERMIT AMENDMENT
EXISTING SITE PLAN
(TCEQ PERMIT NO. MSW-1417C)

TURKEY CREEK LANDFILL
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FIGURE I/II-3.1

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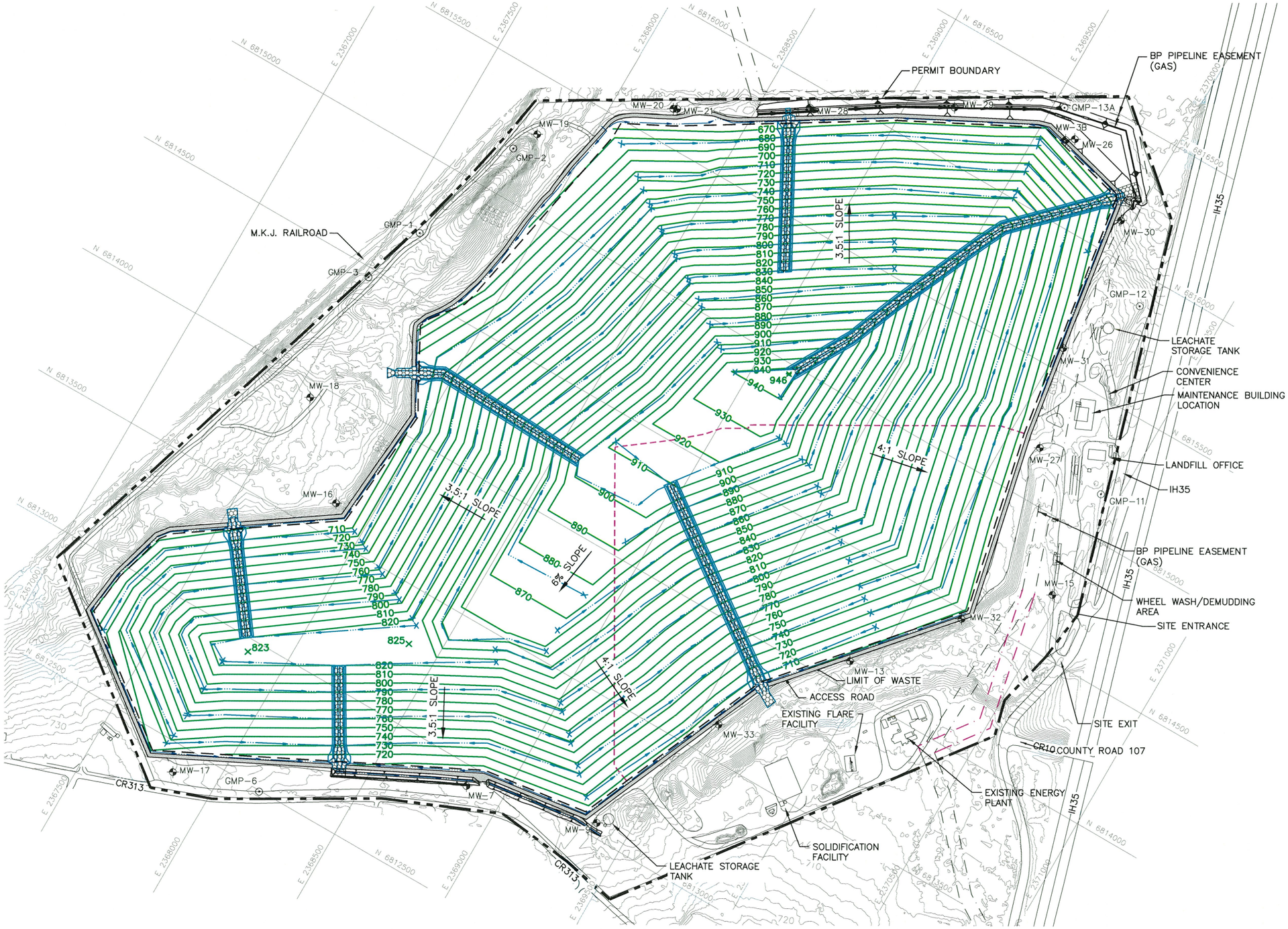
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 3.1-EXISTING SITE PLAN.dwg, rarrington, 1:2



0 200 400
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- 32° 21' 20" GEODETIC COORDINATE
- EASEMENT
- 800 FINAL COVER CONTOUR
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- GABIONS
- MW-2 PERMITTED GROUNDWATER MONITOR WELL
- GMP-4 PERMITTED LANDFILL GAS MONITOR PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. PERMITTED COMPLETION PLAN FINAL COVER CONTOURS OBTAINED FROM TURKEY CREEK LANDFILL PERMIT NO. 1417C.

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LICENSED
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PERMITTED FINAL COVER PLAN
(TCEQ PERMIT NO. MSW-1417C)

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FIGURE I/II-3.2

0:\0771\368\EXPANSION 2021\PARTS I-II\FIG 3.2-PERMITTED FINAL COVER PLAN.dwg, rarrington, 1:2



NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. PERMITTED EXCAVATION CONTOURS OBTAINED FROM TURKEY CREEK LANDFILL PERMIT NO. 1417C. THE ELEVATION OF DEEPEST EXCAVATION (EDE) OF 648 FT-MSL WILL NOT CHANGE.

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FIGURE I/II-3.3

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O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 3.3-PERMITTED EXCAVATION PLAN.dwg, rarrington, 1:2



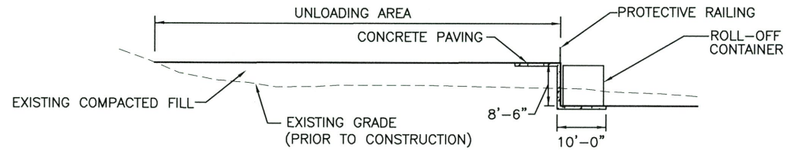
0 30 60
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- EASEMENT
- SECTOR BOUNDARY
- MW-27 — EXISTING GROUNDWATER MONITORING WELL

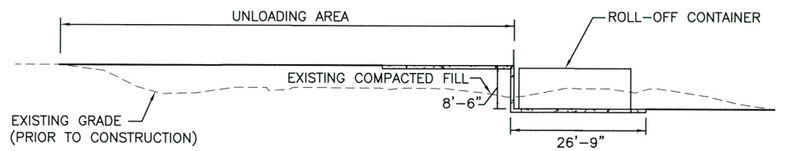
NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. REFER TO PARTS I/II, APPENDIX I/IIA FOR CITIZENS CONVENIENCE CENTER DRAWINGS.



CONVENIENCE CENTER SECTION A (3.4 | 3.4)

0 15 30
SCALE IN FEET



CONVENIENCE CENTER SECTION B (3.4 | 3.4)

0 15 30
SCALE IN FEET

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MAJOR PERMIT AMENDMENT
CITIZENS CONVENIENCE CENTER PLAN

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FIGURE I/II-3.4

O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 3.4-CITIZENS CONVENIENCE CENTER.dwg, rarrington, 1:2

PERMIT BOUNDARY
BP PIPELINE EASEMENT (GAS)
GMP-2A
MW-37A
MW-19
MW-20
MW-21
MW-28
MW-29
GMP-13A
MW-3B
MW-26
MW-36
GMP-1A
M.K.J. RAILROAD
MW-30
IH35
MW-35
GMP-3A
GMP-12
LEACHATE STORAGE TANK
CONVENIENCE CENTER
MW-34
GMP-4A
MW-31
LANDFILL OFFICE
MW-27
IH35 SERVICE ROAD
GMP-14
SCALEHOUSE
GMP-11
BP PIPELINE EASEMENT (GAS)
GMP-5B
SITE ENTRANCE
LIMIT OF WASTE
ACCESS ROAD
GMP-10B
SITE EXIT
MW-38
CR10 COUNTY ROAD 107
GMP-15
MW-17
GMP-6
CR313
GMP-16
MW-42
GMP-7B
MW-39
GMP-17
GMP-9B
MW-40
SOLIDIFICATION FACILITY
LEACHATE STORAGE TANK
MW-41
GMP-8A
CR313

0 200 400
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- 32° 21' 20" GEODETIC COORDINATE
- EASEMENT
- MW-7 PERMITTED GROUNDWATER MONITORING WELL
- GMP-12 PERMITTED GAS MONITORING PROBE
- EXISTING LFG TRENCH VENT
- EXISTING LEACHATE FORCEMAIN
- EW-A9 EXISTING LFG EXTRACTION WELL
- EXISTING LFG COLLECTION PIPING
- HZ-5 EXISTING HORIZONTAL LFG COLLECTOR WITH CHIMNEY WELLS
- LCR-1 EXISTING LEACHATE CLEANOUT RISER CONNECTION
- CS-3 EXISTING CONDENSATE SUMP
- IV-2 EXISTING ISOLATION VALVE
- EXISTING REMOTE WELLHEAD
- EXISTING ROAD CROSSING
- EXISTING BLIND FLANGE
- EXISTING HDPE CAP
- EXISTING PIPE REDUCER
- EXISTING AIR SUPPLY PIPING
- EXISTING CONDENSATE FORCEMAIN
- EXISTING AIR/FORCEMAIN VALVE

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NOTES:
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EXISTING GCCS PLAN
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FIGURE I/II-3.5

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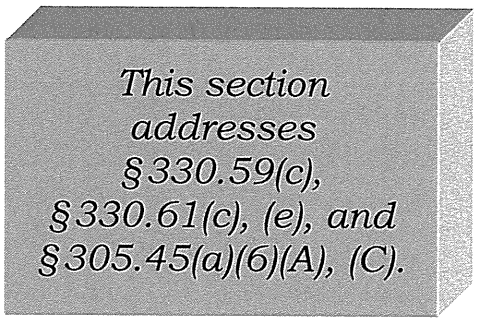
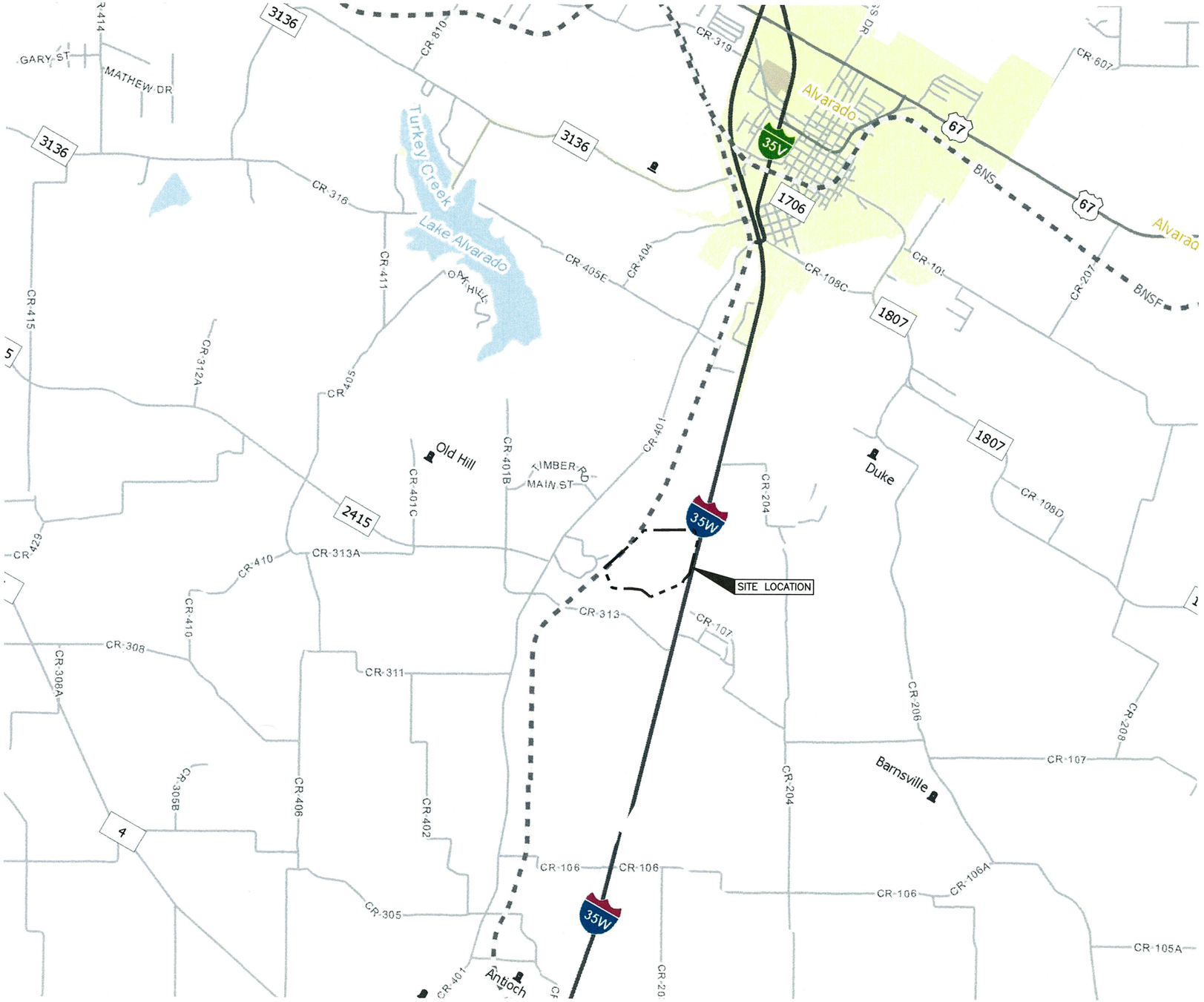
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 3.5-EXISTING GCCS PLAN.dwg, rarrington, 1:2

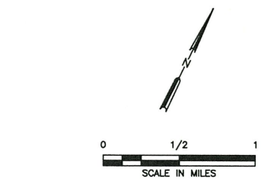
4 MAPS



A site location map and general topographic map are presented on Figures I/II-4.1 and I/II-4.2. Structures and inhabitable buildings located within 500 feet, as well as the nearest residence, are shown on Figure I/II-4.3.

Figure I/II-4.1 and Figure I/II-4.2 show surface water bodies in accordance with Title 30 TAC §330.59(c)(1) and §305.45(a)(6)(A). As noted on Figure I/II-4.2, no springs have been documented within a 1-mile radius of the site. Water wells within 500 feet are shown on Figure I/II-4.3.





LEGEND

PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

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NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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DESIGN BY: JBP
REVIEWED BY: NT

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MAJOR PERMIT AMENDMENT
SITE LOCATION MAP

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FIGURE I/II-4.1

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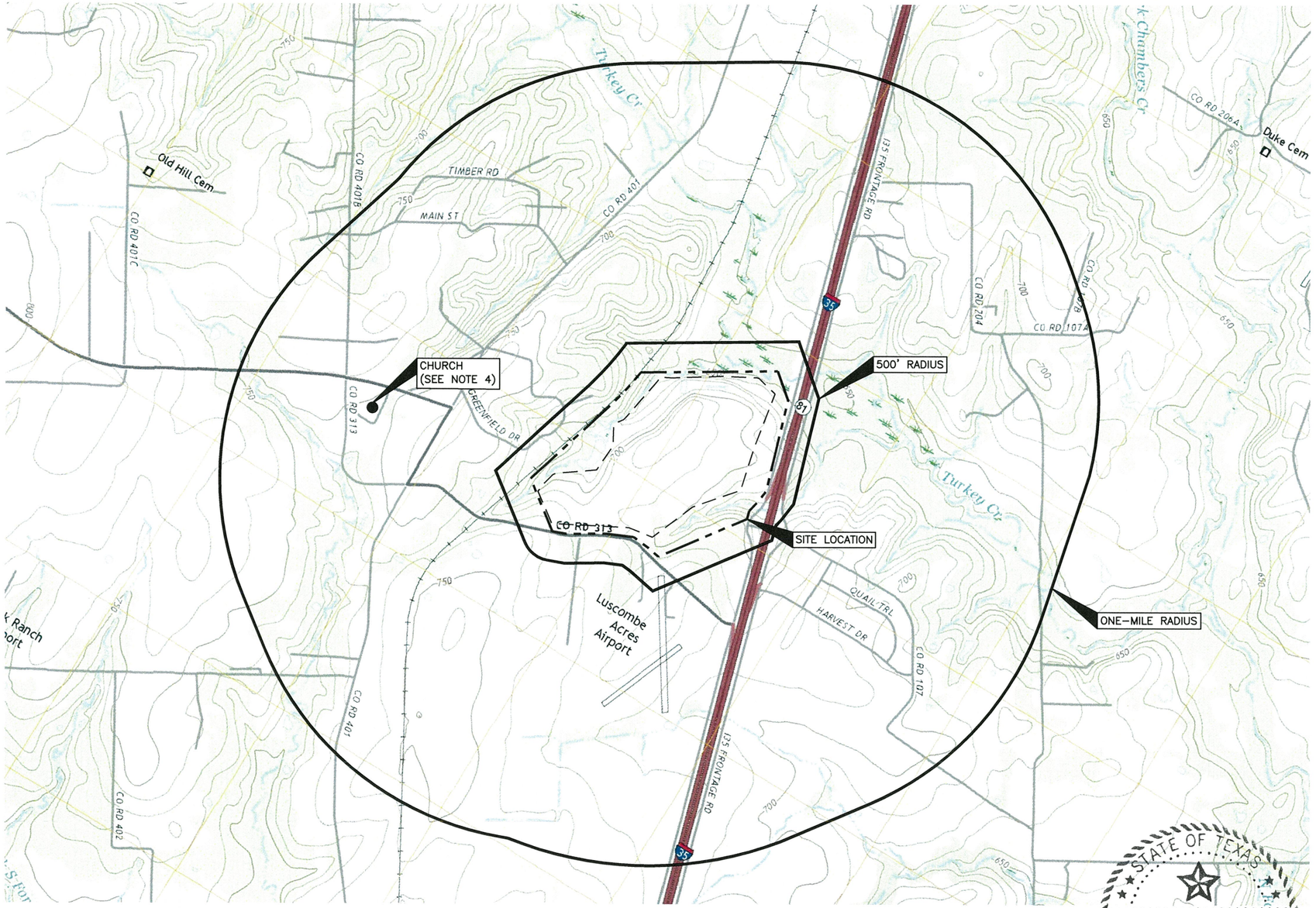
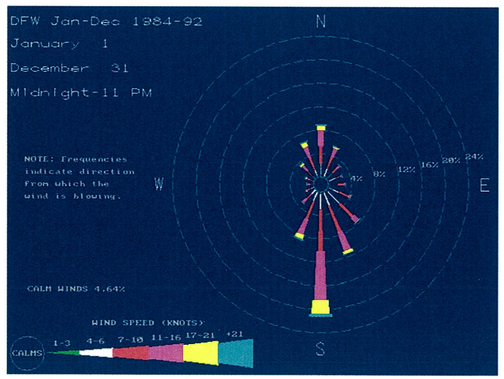
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 4.1-SITE LOCATION MAP.dwg, tarrington, 1:2







0 1000 2000
SCALE IN FEET

LEGEND

PERMIT BOUNDARY

LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

ALVARADO, TX
2019

GRANDVIEW, TX
2019

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads..... U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2000 - 2018
Contours.....National Elevation Dataset, 2003 - 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 1981

NOTES:

1. THE SITE ACCESS ROADS WITHIN ONE MILE OF THE SITE ARE IH-35, COUNTY ROADS 313, 107, 204, 401, AND FM 2415. REFER TO SECTION 8 FOR ADDITIONAL INFORMATION.
2. SEE FIGURE I/II-5.1 FOR PROPERTY OWNERS WITHIN 1/4-MILE OF THE SITE.
3. SEE SECTION 7.2 FOR DISCUSSION OF WATER WELLS. WATER WELLS LOCATED WITHIN 500 FEET OF THE PERMIT BOUNDARY ARE SHOWN ON FIGURE I/II-4.3. REFER TO APPENDIX IIIG WATER WELLS WITHIN ONE MILE OF THE PERMIT BOUNDARY.
4. THERE IS ONE CHURCH WITHIN ONE MILE OF THE PROPOSED PERMIT BOUNDARY. THE CHURCH IS LOCATED APPROXIMATELY 4,300 FEET (0.81 MILES) WEST OF THE PERMIT BOUNDARY. THERE ARE NO KNOWN SCHOOLS, HISTORIC SITES, DAY CARE CENTERS, KNOWN ARCHEOLOGICALLY SIGNIFICANT SITES, CEMETERIES OR SITES OF EXCEPTIONAL AESTHETIC QUALITY LOCATED WITHIN ONE MILE OF THE PERMIT BOUNDARY. REFER TO SECTION 7 FOR ADDITIONAL INFORMATION.
5. NO SPRINGS ARE DOCUMENTED WITHIN ONE-MILE OF THE PERMIT BOUNDARY.
6. REFER TO FIGURE 4.3 FOR LOCATION OF THE NEAREST RESIDENCE.
7. REFER TO SECTION 8 FOR AIRPORTS LOCATED WITHIN 6-MILES OF THE PERMIT BOUNDARY.
8. REFER TO APPENDIX I/IIA, DRAWING I/IIA.1 FOR EASEMENT INFORMATION AND DRAWING I/IIA.11 FOR ACCESS CONTROL INFORMATION.
9. THE WIND ROSE IS REPRODUCED FROM THE TEXAS AUTOMATED SURFACE OBSERVING SYSTEM (ASOS) AT THE DFW AIRPORT. THE ASOS IS A JOINT PROGRAM OF THE NATIONAL WEATHER SERVICE, THE FEDERAL AVIATION ADMINISTRATION AND THE DEPARTMENT OF DEFENSE.
10. ALL TOPOGRAPHIC INFORMATION REPRODUCED FROM UNITED STATES GEOLOGICAL SURVEY 7 1/2 MINUTE QUADRANGLE SHEETS COMMERCE ALVARADO, TX; GRANDVIEW, TX.

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MAJOR PERMIT AMENDMENT
GENERAL TOPOGRAPHIC MAP

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FIGURE I/II-4.2

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O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 4.2-GENERAL TOPO MAP.dwg, farrington, 1:2



N

0 300 600

SCALE IN FEET

LEGEND

- PROPERTY/PERMIT BOUNDARY
- LIMITS OF WASTE
- OSWW — ON-SITE WATER WELL IDENTIFIED DURING SITE RECONNAISSANCE AND IN FACILITY RECORDS
- R — RESIDENTIAL (SEE NOTE 2)
- A — AGRICULTURAL/OPEN SPACE (INCLUDING SCATTERED RESIDENCES, SEE NOTE 2)

NOTES:

1. AERIAL IMAGERY PROVIDED BY GOOGLE EARTH, DATED MARCH 21, 2018.
2. ALL STRUCTURES WITHIN 500 FEET ARE SHOWN ON THIS FIGURE. EACH STRUCTURE IS ASSUMED TO BE HABITABLE. LAND USE WITHIN A 500 FOOT RADIUS OF THE SITE CONSISTS OF RESIDENTIAL AND AGRICULTURAL AREAS. THE NEAREST STRUCTURE TO THE PERMIT BOUNDARY IS APPROXIMATELY 50 FEET WEST OF THE PERMIT BOUNDARY. THERE ARE SEVERAL RESIDENCES ON THE WEST AND SOUTH SIDES OF THE LANDFILL THAT ARE WITHIN 500 FEET OF THE PERMIT BOUNDARY.
3. REFER TO APPENDIX IIIG FOR ADDITIONAL WATER WELL INFORMATION.

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0:\0771\368\EXPANSION 2021\PARTS I-II\FIG 4.3-STRUCTURES AND BUILDINGS.dwg, rarrington, 1:2

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MAJOR PERMIT AMENDMENT
STRUCTURES, INHABITABLE BUILDINGS, AND WATER WELLS WITHIN 500 FEET

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-4.3

5 PROPERTY OWNERS LIST AND MAP

This section addresses §330.59(c) and §305.45(a)(6)(D).

The following list and figure provide the names, mailing addresses, and locations of the "Adjacent and Potentially Affected Landowners" within ¼ mile of the Turkey Creek Landfill. The numbers on the property owners list correspond to the numbers listed on Figure I/II-5.1. The list is based on records of the Johnson County Appraisal District as of February 2022. Refer to Figure I/II-5.1, Property Owners Map, for location of the properties. Based on a discussion with the Johnson County Appraisal District, they do not maintain mineral interest ownership records.

TABLE 5-1
PROPERTY OWNERS LIST

1. MARC STEVEN VANLIERE
   7600 CR 313
   GRANDVIEW TX 76050

2. BLAIRTOWN ENERGY CENTER LLC
   1993 DEWAR DR #1-291
   ROCK SPRINGS WY 82901-5780

3. ABEL P OVIEDO ET UX STACEY L
   7512 CR 313
   GRANDVIEW TX 76050-2906

4. DAVID A WEST
   1024 CR 705
   JOSHUA TX 76058-5536

5. JOHN COOLEY
   401 CR 810
   ALVARDO TX 76009

6. REECE COOLEY
   7537 CR 313
   GRANDVIEW TX 76050

7. JAMES F MARTIN
   PO BOX 1462
   ALVARADO TX 76009-1462

8. ERIC SHERRARD
   PO BOX 1318
   GRANDVIEW TX 76050

9. CR 313 LLC
   PO BOX 430239
   HOUSTON TX 77243-0239

10. TRINIDAD ORTEGA & BLANCA E GOMEZ
    7416 GREENFIELD DR
    ALVARADO TX 76009

11. YOSELIN RODRIGUEZ
    6207 CR 608
    BURLESON TX 76028

12. STACY L GRIMLAN
    7500 GREENFIELD DR
    ALVARADO TX 76009

13. JIM GRIMLAN
    7500 GREENFIELD DR
    ALVARADO TX 76009

14. YOLANDA GONZALEZ
    7504 GREENFIELD DR
    ALVARADO TX 76009

15. VERONICA COOLEY
    7512 GREENFIELD DR
    ALVARADO TX 76009

16. DU.S.TIN HARLEY REYNOLDS
    7516 GREENFIELD DR
    ALVARADO TX 76009

17. DANA L CURTIS
    7520 GREENFIELD DR
    ALVARADO TX 76009

18. MANETT BOTELLO
    7600 GREENFIELD DR
    ALVARADO TX 76009

19. TERRY GOSS
    7511 GREENFIELD DR
    ALVARADO TX 76009

20. JIM GRIMLAN ET UX CHERYL
    7500 GREENFIELD DR
    ALVARADO TX 76009

TABLE 5-1
PROPERTY OWNERS LIST (CONTINUED)

21. NELLIE CASTLEBERRY
7417 GREENFIELD DR
ALVARADO TX 76009

22. RICHARD G SHOEMAKE ET UX JO E
7417 GREENFIELD DR
ALVARADO TX 76009

23. TIM RHYS & LOV SENDIA
7409 GREENFIELD DR
ALVARADO TX 76009

24. JOEL RODRIGUEZ JR & ELENA MA RODRIGUEZ
3909 CR 401
ALVARADO TX 76009

25. BILLY C BAZE ET UX TIFANI G
7825 GREENFIELD DR
ALVARADO TX 76009

26. WILLIAM J GONYEA
286 CR 1388
YANTIS TX 75497-4562

27. GONYEA ENTERPRISES
7809 GREENFIELD DR
ALVARADO TX 76009

28. DARRELL & CARLA MILLER
7801 GREENFIELD DR
ALVARADO TX 76009-7203

29. DANNY & MELISSA P POWERS
7721 GREENFIELD DR
ALVARADO TX 76009-7279

30. BARBARA GRIFFIN
7709 GREENFIELD DR
ALVARADO TX 76009

31. JOHN O ELDER JR
7617 GREENFIELD DR
ALVARADO TX 76009-8206

32. SANTOS GALVEZ ET UX MARIA DEL ROSARIO
7609 GREENFIELD DR
ALVARADO TX 76009

33. JOASIM LOZANO SUAREZ ET UX
6216 66TH ST APT 1603
LUBBOCK TX 79424-5948

34. JOSE & ORELIA DUENEZ ALBERTO
7616 GREENFIELD DR
ALVARADO TX 76009

35. ROBERT ORSO
7700 GREENFIELD CT
ALVARADO TX 76009

36. DOYLE D TAYLOR
7712 GREENFIELD CT
ALVARADO TX 76009

37. STEPHEN J HEINLEIN
7716 GREENFIELD CT
ALVARADO TX 76009

38. MIKE KERBY
7713 GREENFIELD CT
ALVARADO TX 76009

39. SHERRIN ALEXANDER
7705 GREENFIELD CT
ALVARADO TX 76009

40. JAVIER DELGADO
7701 GREENFIELD CT
ALVARADO TX 76009

TABLE 5-1
PROPERTY OWNERS LIST (CONTINUED)

41. STEVEN A WEBB ET UX LORA DENISE
1530 PB LN
WICHITA FALLS TX 76302

42. ENERGY PROPERTY PARTNERS LLC
3000 N SAM HOUSTON PKWY E
HOUSTON TX 77032

43. LISA HARRIS
8825 S IH 35W
ALVARADO TX 76009

44. JOHN D BACON
8733 S IH 35W
ALVARADO TX 76009

45. ALBATROSS ACRES LLC
6603 CR 305
GRANDVIEW TX 76050

46. TOMMY AND JANET STEPPICK
REVOCABLE TRU.S.T TRU.S.TEES
3456 CR 204
ALVARADO TX 76009

47. IESI TX LANDFILL LP
3 WATERWAY SQUARE PL SUITE 110
THE WOODLANDS TX 77380

48. DAVID MICHAEL OVERTURF ET UX
JOYCE FAYE
9101 S IH 35W
GRANDVIEW TX 76050

49. AFFORDABLE LOGISTICS INC
11101 CALABASH AVE
FONTANA CA 92337

50. CRISP FAMILY LIMITED
5201 SAUNDERS ROAD
FORT WORTH TX 76119

51. WILLIAM CALAWAY
PO BOX 622
MANSFIELD TX 76063-0622

52. FERNANDO LARIZ JR
8101 HARVEST DR
GRANDVIEW TX 76050

53. MICHAEL RAMIREZ ET UX GLENDA
8009 HARVEST DR
GRANDVIEW TX 76050

54. BONNIE J SMITH
8001 HARVEST DR
GRANDVIEW TX 76050

55. LUCYE BULL PRCIN
6104 LOUISVILLE DR
LUBBOCK TX 79413

56. DEAN L JOHNSON ET UX
86 BELMONT LN
VAN ALSTYNE TX 75495

57. ENRIQUE OJEDA
PO BOX 638
GRANDVIEW TX 76050

58. JASON ARTHUR WEIGLER
2207 COUNTRY CLUB RD
CLEBURNE TX 76033

59. CHRISTILYNN DAWN JONES
PO BOX 519
ALVARADO TX 76009

60. HARRY L PHILLIPS & BARBARA J & JANET M
8032 CR 313
GRANDVIEW TX 76050

TABLE 5-1
PROPERTY OWNERS LIST (CONTINUED)

61. HARRY L PHILLIPS & BARBARA J
8024 CR 313
GRANDVIEW TX 76050

62. SEAN BURKETT ET UX JENNIFER
8016 CR 313
GRANDVIEW TX 76050

63. JESSICA DOWLING SANCHEZ
ET VIR DAVID
8000 CR 313
GRANDVIEW TX 76050

64. MAX A GIBBS & EDNA L
8004 CR 313
GRANDVIEW TX 76050

65. CHARLES M BARRETT JR
7964 CR 313
GRANDVIEW TX 76050

66. MAGDELENO CASTRO ET UX BEATRIZ
7908 CR 313
GRANDVIEW TX 76050

67. JIMMY J ATLAS ET UX CLAUDIA
4920 CR 401
GRANDVIEW TX 76050

68. U.S.AMA MU.S.TAFA SAEED AWAD
705 S CENTER ST APT 7
ARLINGTON TX 76010

69. JHHB LLC
PO BOX 270285
FLOWERMOUND TX 75027

70. JOHN COOLEY
7537 CR 313
GRANDVIEW TX 76050

71. MARY PARRISH ELLIS
7609 GREENFIELD DR
ALVARADO TX 76009

72. JONATHAN E MINGUS DAB NATIONAL HOMES
617 PLEASANT VALLEY DR
BURLESON TX 76028

73. ALBATROSS ACRES LLC
PO BOX 440
GRANDVIEW TX 76050

74. WILLIAM P & AUGU.S.TA ZIELINSKI
9316 WHEATFIELD RD
GRANDVIEW TX 76050

75. SEAN BURKETT ET UX JENNIFER
8016 CR 313
GRANDVIEW TX 76050



0 500 1000
SCALE IN FEET

LEGEND

- LANDFILL PERMIT BOUNDARY
- 43 — PARCEL NUMBER (SEE NOTES 1 AND 2)
- 1/4 MILE COVERAGE AREA (SEE NOTE 3)

NOTES:

1. REFERS TO LANDOWNERS LISTED ON PROPERTY OWNERS LIST IN SECTION 5, PROPERTY OWNERS LIST AND MAP.
2. PROPERTY OWNERS LIST AND PARCEL LOCATIONS WERE OBTAINED FROM JOHNSON COUNTY APPRAISAL DISTRICT RECORDS.
3. THE HATCH SHOWN REPRESENTS A ¼ MILE DISTANCE FROM THE LANDFILL PERMIT BOUNDARY.

STATE OF TEXAS
CHARLES R. MARSH
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PROFESSIONAL ENGINEER
2.22.22

0:\0771\368\EXPANSION 2021\PARTS I-II\FIG 5.1-PROPERTY OWNER MAP.dwg, jwilson, 1:2

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REVIEWED BY: NT

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MAJOR PERMIT AMENDMENT
PROPERTY OWNERS MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-5.1

6 AERIAL PHOTOGRAPH

An aerial photograph of the site and the surrounding area (minimum of 1-mile radius from the site) is presented on Figure I/II-6.1.

This section addresses §330.61(f).





0 1000 2000
SCALE IN FEET

LEGEND

PROPERTY/PERMIT BOUNDARY

PERMITTED LIMITS OF WASTE

PROPOSED LIMITS OF WASTE

NOTES:

1. AERIAL PHOTOGRAPH PROVIDED BY GOOGLE MAPS FROM AERIAL PHOTOGRAPHY FLOWN MARCH 21, 2018.



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MAJOR PERMIT AMENDMENT
AERIAL PHOTOGRAPH

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-6.1

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O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 6.1-AERIAL MAP.dwg, rarrington, 1:2

7 LAND USE

7.1 Background

This section addresses §330.61(g), §330.61(h), and §305.45(a)(6)(B).

The Turkey Creek Landfill is located in eastern Johnson County, approximately 2.5 miles south of Alvarado, Texas. The property is approximately 219.6 acres in size, and is highly disturbed from ongoing landfill development and facility operations. The primary route of access to the landfill is by Interstate Highway 35 West (IH-35W), which borders the eastern boundary of the landfill property. Several secondary rural routes also can be used to access the landfill property. The landfill property is located approximately 2.5 miles south of Alvarado, 6 miles north of Grandview, and 11 miles east of Cleburne, Texas.

General observations of residential growth in the vicinity of the landfill indicates that slow growth is occurring, with most growth being single homes or trailers located on rural acreage. Observations of commercial and light industrial development between Alvarado to the north and the landfill property indicates some growth, with several major commercial or light industrial facilities observed.

7.2 Land Use

A land use evaluation was performed for the area within 1 mile of the landfill permit boundary. Land use information is summarized on the following maps.

- Figure I/II-7.1 (Land Use Map – Aerial). This map highlights land use within a 1-mile radius of the site on an aerial photograph.
- Figure I/II-7.2 (Land Use Map). This map highlights land use within a 1 mile radius of the property boundary.
- Figure I/II-7.3 (Zoning Map). This map indicated major land uses within 1 mile of the site.
- Figure I/II-7.4 (Cities within 5-Mile Radius). This map is used to show area cities within 5 miles and to summarize growth trends.

7.3 Location and Zoning

Review of the City of Alvarado zoning map indicates the landfill property is within the Extraterritorial Jurisdiction (ETJ) of the City of Alvarado, but not subject to City of Alvarado zoning requirements. An ETJ designation allows the City of Alvarado to regulate some activities of properties located within their ETJ. A discussion with a representative of the City of Alvarado Development and Permitting Services confirmed that the ETJ designation imposes no restrictions on the development, permitting, or continued operation of the landfill, including future expansion of the landfill.

7.4 Surrounding Land Use

Land use within a 1-mile radius of the landfill property is predominantly wooded floodplain, open/agricultural lands, and rural residential with scattered commercial and light industrial facilities located in the near vicinity of the landfill property, primarily along the landfill's western and northern property boundaries, and along the IH-35W corridor.

Major commercial/light industrial facilities located within the 1-mile radius of the landfill property include oilfield service and technology providers, which include equipment staging, warehouse facilities, manufacturing, offices, and other associated activities. An equipment maintenance and/or salvage yard is observed south of the landfill property (east of IH-35W) with numerous oilfield construction, drilling and mineral recovery pads distributed across the 1-mile radius.

There are several rural residential areas scattered to the east and west of the landfill property, including rural residential properties located east of the landfill property, across IH-35W.

South beyond the landfill property, and north and northwest of the property are mostly wooded and open/agricultural areas, with scattered rural residential homesteads. The rural residential neighborhoods within 1 mile include approximately 160 to 180 rural homesteads. There are an estimated 10 or less commercial/light industrial facilities (multiple structures at each facility) located within the 1-mile radius of the landfill property.

Review of historical aerial photographs indicate that much of the rural residential and commercial/light industrial development within the vicinity of the landfill property has been in existence for over 20 years. The rural residential area west of the landfill property (west of the floodplain of Turkey Creek and the railroad right-of-way) has experienced some minor growth of rural development in the past 20 years.

7.5 Growth Trends of the Nearest Community

The facility property is located within the ETJ of Alvarado, but is not located within the city limits. The city of Alvarado is the only city located within the 5-mile radius of the landfill property (see figure I/II-7-3). As indicated in the November 2020 Estimates of the Total Populations of Counties and Places in Texas for July 1, 2019 and January 1, 2020, developed by the Texas Demographic Center, Johnson County had an estimated population of 175,987 persons in 2020 and experienced a 16.6 percent growth for the period 2010 to 2020 (approximately 1.5 percent annual growth). Similarly, the City of Alvarado had a 2020 estimated population of 4,647 persons with a 22.8 percent growth over the same period (approximately 2.07 percent annual growth).

Future growth trends for Johnson County were further assessed by review of the population projections prepared by the Texas Water Development Board (TWDB) as presented in their 2021 Regional Water Plan. Growth trend projections are presented in Table 7-1.

Table 7-1
Growth Trends
Projected Average Annual Growth Rate

Community	2021-2030	2031-2040	2041-2050
Johnson County	1.54%	1.38%	1.33%

Based on the information above, and the fact that Alvarado is located approximately 18 miles south of the growing metropolitan area of Fort Worth, steady growth is expected to continue into the future. Additionally, growth will come from the more densely populated, smaller communities located to the north and west of Alvarado and the landfill property.

It is anticipated that the growth patterns will be consistent with the growth patterns over the last several years (i.e., scattered rural houses and commercial and light industrial businesses will continue to be built in the area with most of the growth concentrated along the IH-35W corridor).

7.6 Proximity to Residences and Other Uses

The nearest identified residence is found approximately 50 feet from the landfill property along the southwest property boundary. The nearest business property (Halliburton or a subsidiary company) is located to the north, with approximately 145 feet measured between fence line to fence line of the properties on aerial photography.

A private, grass field airfield (Luscombe Acres) is located approximately 500 feet south of the landfill property. The airfield includes 2 grass runways used by piston aircraft. The airfield appears to be used primarily by residences that border the runways. Additional information related to the airfield is provided in Section 8.2.

One church was identified as being located within the 1-mile radius of the landfill property. The Greenbriar Baptist Church is located approximately 4,300 feet west of the landfill property, on County Road 313. A previous land use evaluation prepared for the landfill property indicates that a historical marker was placed at the church for educational purposes, but that the church is not a registered historical landmark, as was verified with the Texas Historical Commission. There are no known hospitals, archaeological sites, historical sites, lakes, or sites with exceptional aesthetic qualities located within a 1-mile radius of the landfill permit boundary.

7.7 Land Use Conclusions

The continued development and use of this property as a landfill represents a compatible land use for the following reasons:

- The site is located in a rural area, with ongoing growth within the 1-mile radius of the landfill property appearing to be minimal over the previous 20 plus years (based on review of aerial photography).
- The landfill is designed and operated to have minimal impact on the surrounding areas and land uses. A substantial vegetation screening buffer is provided by wooded vegetation existing along the north, northwest, southwest, and southeast boundaries of the landfill. The wooded vegetation helps to minimize the visual and noise impact of the landfill operations.
- With the nearby development being primarily rural residential, open lands and agricultural, with some distributed commercial and light industrial development, the landfill is a compatible land use.

7.8 Water Wells Within 500 Feet

A search to identify water wells within a 1-mile radius of the landfill permit boundary was completed by GeoSearch (September 2021) and WCG (August 2021), the results of which are provided in Part III, Appendix IIIG, Section 2.5 and Appendix IIIG-A. The water well locations are plotted on the Figure IIIG-A-6 (Water Wells Within One-Mile Radius map). In summary, the only identified water well located within 500 feet of the permit boundary is the on-site water well which provides water to Turkey Creek Landfill. The location of the onsite water well is indicated on Figure I/II-4.3.

As the site is developed, any wells encountered in the waste cell construction areas will be plugged in accordance with the Site Operating Plan and the applicable rules and regulations of the TCEQ, the TWDB, the Railroad Commission of Texas, or other applicable state agencies.



N

0 1000 2000
SCALE IN FEET

LEGEND

	PROPERTY/PERMIT BOUNDARY
	PERMITTED LIMITS OF WASTE
	PROPOSED LIMITS OF WASTE
F	FEMA 100-YEAR FLOODPLAIN (SEE NOTE 7)
L	LANDFILL
C	COMMERCIAL
R	RESIDENTIAL
AF	AIRFIELD
CH	CHURCH

NOTES:

1. AERIAL PHOTOGRAPH PROVIDED BY GOOGLE MAPS FROM AERIAL PHOTOGRAPHY FLOWN MARCH 21, 2018.
2. LAND USE IS SHOWN WITHIN THE ONE-MILE BOUNDARY.
3. THERE ARE NO KNOWN SCHOOLS, LICENSED DAY-CARE FACILITIES, HOSPITALS, LAKES, ARCHAEOLOGICAL SITES, OR SITES WITH EXCEPTIONAL AESTHETIC QUALITIES WITHIN THE ONE-MILE RADIUS. A FEW SMALL STOCK PONDS ARE WITHIN THE ONE-MILE RADIUS.
4. THE PRIMARY SITE ACCESS ROADS WITHIN 1-MILE OF THE SITE INCLUDES INTERSTATE HIGHWAY 35W. REFER TO SECTION 8 FOR ADDITIONAL INFORMATION.
5. EXCEPT AS OTHERWISE SHOWN, LAND USE IS AGRICULTURAL (CATTLE GRAZING, CROPLAND, OPEN SPACE).
6. AREAS LABELED "RESIDENTIAL" REPRESENT AREAS WITH SEVERAL CLUSTERED RESIDENCES, AND RURAL RESIDENTIAL PROPERTIES.
7. FLOODPLAIN LIMITS REPRODUCED FROM FEMA FIRM PANEL NUMBER 48251C0350J FOR JOHNSON COUNTY, TEXAS AND INCORPORATED AREAS, EFFECTIVE DATE DECEMBER 4, 2012.

STATE OF TEXAS
CHARLES R. MARSH
105073
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PROFESSIONAL ENGINEER
2.22.22

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MAJOR PERMIT AMENDMENT
LAND USE MAP-AERIAL

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-7.1

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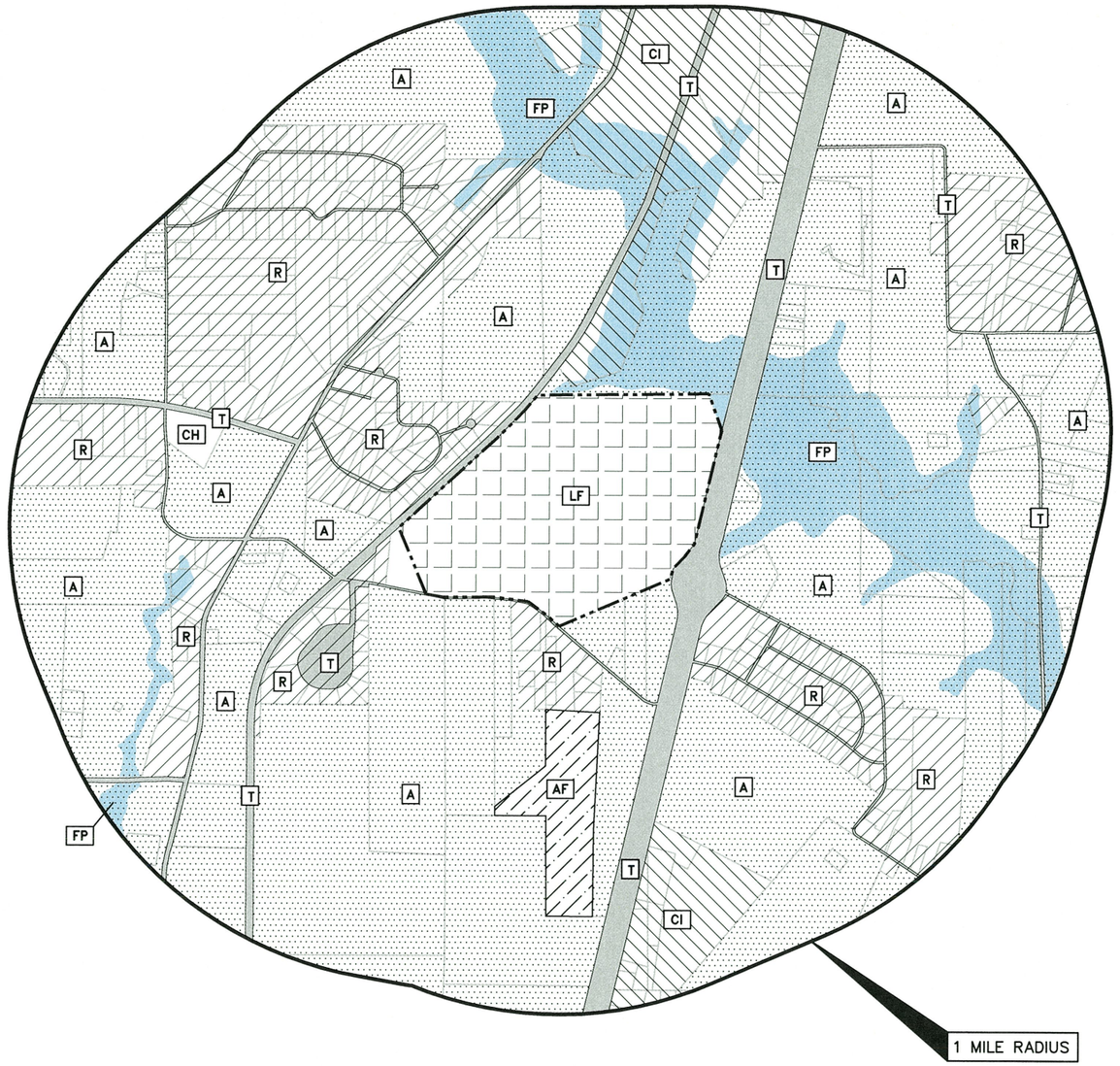
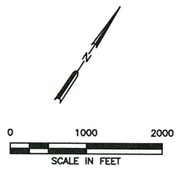
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 7.1-LAND USE MAP.dwg, rarrington, 1:2







LEGEND

- LANDFILL PERMIT BOUNDARY
- A — AGRICULTURE/OPEN SPACE (INCLUDING SCATTERED RESIDENCES)
- AF — AIR FIELD
- CH — CHURCH
- CI — COMMERCIAL, LIGHT INDUSTRIAL
- FP — FLOODPLAIN
- R — RESIDENTIAL, RURAL RESIDENTIAL
- T — TRANSPORTATION CORRIDOR
- LF — TURKEY CREEK LANDFILL

LAND USE WITHIN 1 MILE OF PERMIT BOUNDARY

	ACRES	PERCENT
AGRICULTURE/OPEN SPACE (INCLUDING SCATTERED RESIDENCES)	2020.4	54.6%
AIR FIELD	49.5	1.3%
CHURCH	9.0	0.2%
COMMERCIAL/LIGHT INDUSTRIAL	274.1	7.4%
FLOODPLAIN*	389.8	–
RESIDENTIAL, RURAL RESIDENTIAL	537.9	14.5%
TRANSPORTATION CORRIDOR	590.3	16.1%
TURKEY CREEK LANDFILL	219.6	5.9%
TOTAL	3700.9	100.0%

* THE AREA OF FLOODPLAIN (389.8 ACRES) IS NOT USED TO CALCULATE THE PERCENT AREA OR TOTAL ACREAGE IN THE ABOVE TABLE.

NOTES:

1. REFER TO FIGURE I/II–7.1 FOR LOCATION OF RESIDENCES.
2. MINERAL EXPLORATION PADS (OIL AND GAS) ARE VISIBLE ON FIGURE I/II–7.1, BUT HAVE NOT BEEN REPRESENTED ON THIS MAP.
3. LAND USE IS SHOWN WITHIN THE ONE–MILE BOUNDARY.
4. THERE ARE NO KNOWN LICENSED DAYCARES, HOSPITALS, RECREATION AREAS, LAKES, ARCHAEOLOGICAL SITES, OR SITES WITH EXCEPTIONAL AESTHETIC QUALITIES LOCATED WITHIN THE ONE MILE RADIUS.
5. THERE ARE SEVERAL STOCK PONDS LOCATED WITHIN ONE MILE OF THE SITE THAT ARE USED FOR AGRICULTURAL PURPOSES.
6. EXCEPT AS OTHERWISE SHOWN, LAND USE IS PREDOMINANTLY AGRICULTURAL/OPEN SPACE/WOODED, AND RURAL RESIDENTIAL WITH SOME INDUSTRIAL/COMMERCIAL FACILITIES WITHIN ONE MILE.
7. FLOODPLAIN LIMITS REPRODUCED FROM FEMA FIRM PANEL NUMBER 48251C0350J FOR JOHNSON COUNTY, TEXAS AND INCORPORATED AREAS, EFFECTIVE DATE DECEMBER 4, 2012.

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NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT LAND USE MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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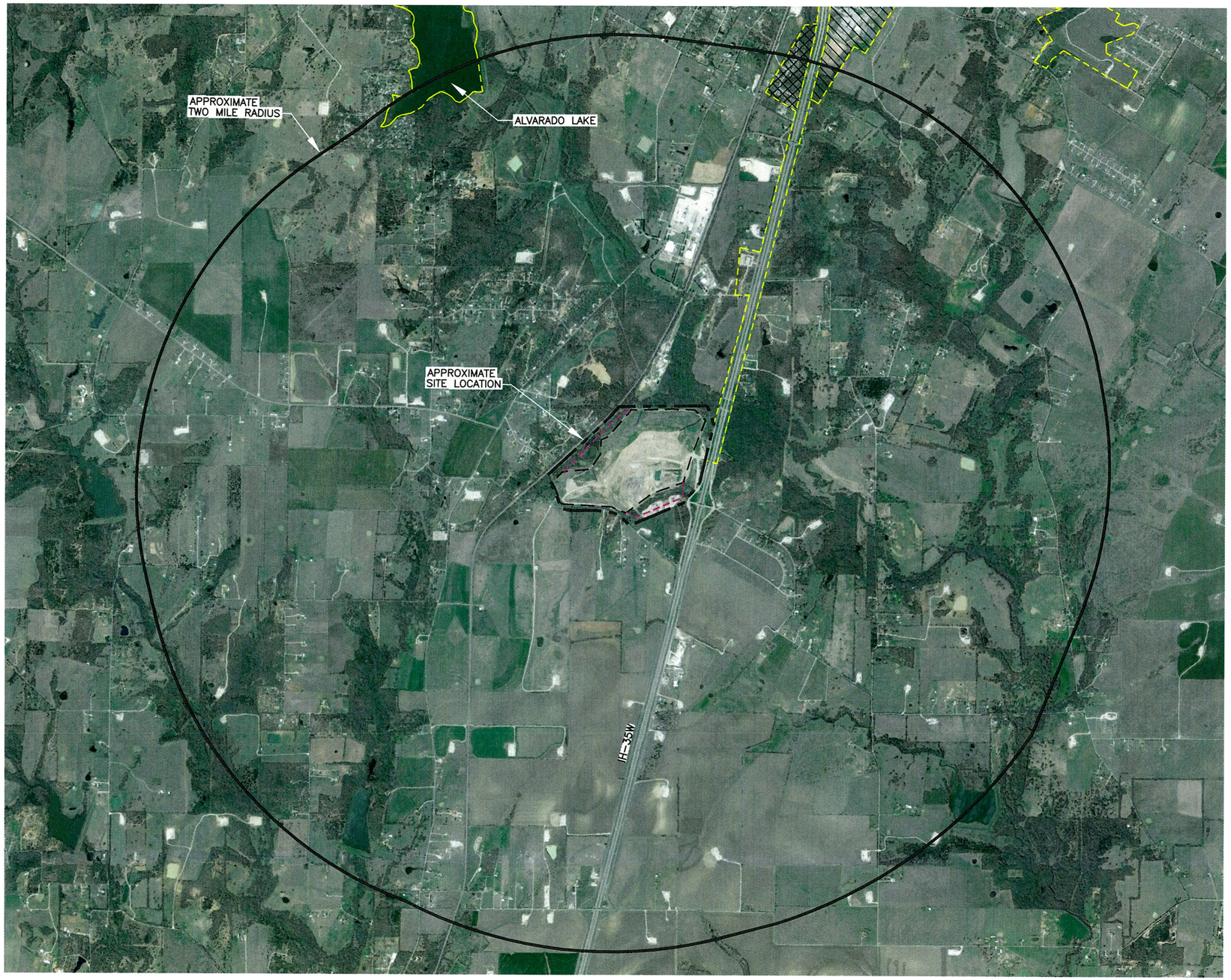
FIGURE I/II–7.2

O:\0771\368\EXPANSION 2021\PARTS I–II\FIG 7.2–LAND USE MAP.dwg, rarrington, 1:2





0 1500 3000
SCALE IN FEET

LEGEND

- PROPERTY/PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- INCORPORATED LIMITS CITY OF ALVARADO (SEE NOTE 3)
- MANUFACTURED HOME PARK DISTRICT 2
- INSTITUTIONAL DISTRICT

NOTES:

1. AERIAL PHOTOGRAPH PROVIDED BY GOOGLE MAPS FROM AERIAL PHOTOGRAPHY FLOWN MARCH 21, 2018.
2. ZONING INFORMATION PROVIDED BY THE CITY OF ALVARADO ZONING MAP 2017.
3. THE PROPERTY/PERMIT BOUNDARY BORDERS THE ALVARADO CITY LIMITS BUT DOES NOT CROSS INTO THE CITY.



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MAJOR PERMIT AMENDMENT ZONING MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-7.3

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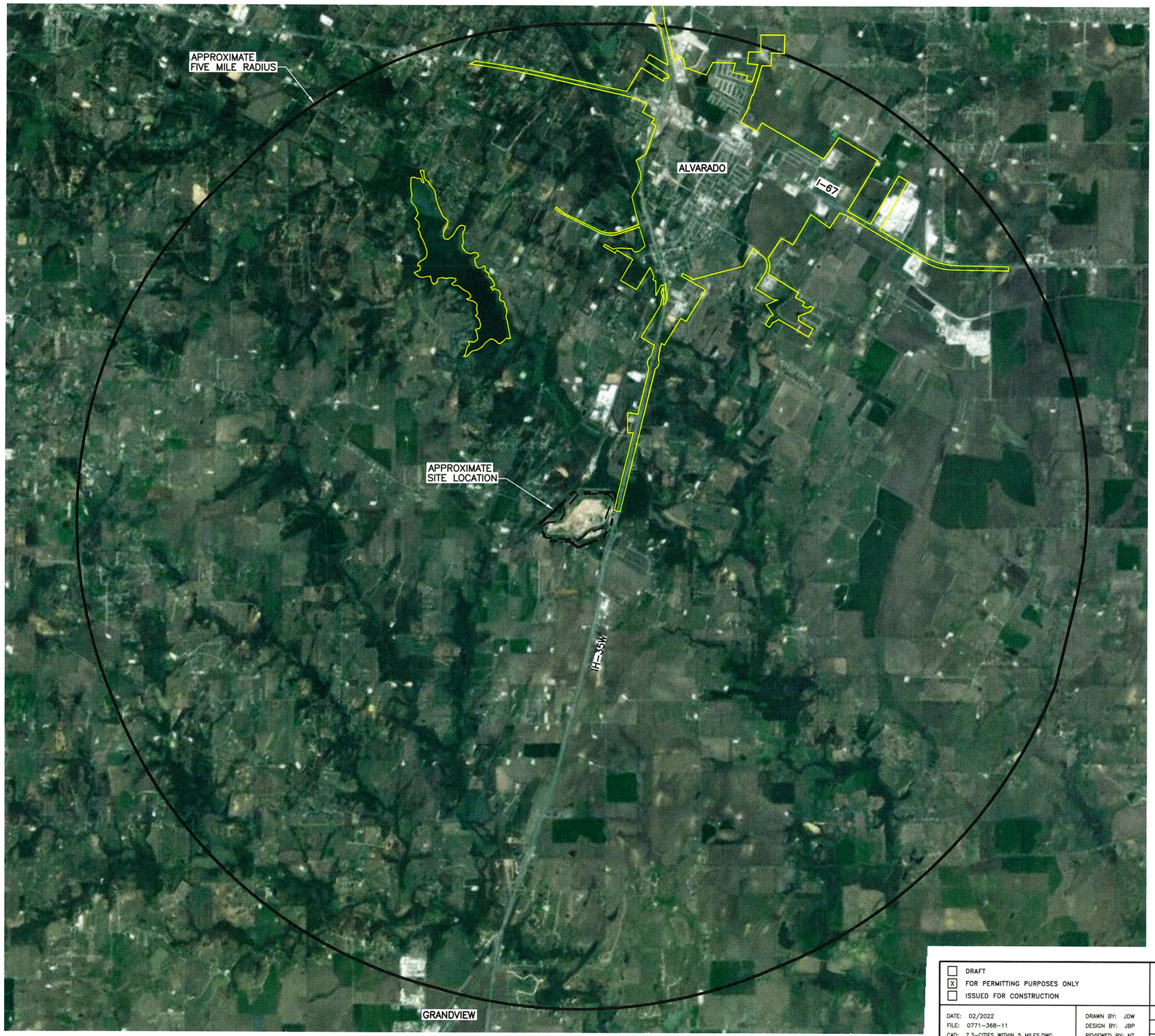

N

0 3000 6000
SCALE IN FEET

LEGEND

- PROPERTY/PERMIT BOUNDARY
- LIMITS OF WASTE
- INCORPORATED LIMITS CITY OF ALVARADO (SEE NOTE 2)

NOTES:

1. AERIAL PHOTOGRAPH PROVIDED BY GOOGLE MAPS FROM AERIAL PHOTOGRAPHY FLOWN MARCH 21, 2018.
2. THE PROPERTY/PERMIT BOUNDARY BORDERS THE ALVARADO CITY LIMITS BUT DOES NOT CROSS INTO THE CITY.

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NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
CITIES WITHIN 5-MILE RADIUS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-7.4

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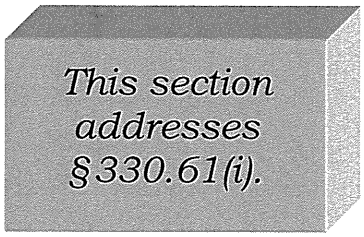
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG 7.4-CITIES WITHIN 5 MILES.dwg, rarrington, 1:2

8 TRANSPORTATION

8.1 Traffic Information



8.1.1 Availability and Adequacy of Roads

The Turkey Creek Landfill is located approximately 2.5 miles south of Alvarado, Texas, on Interstate Highway 35 West (IH-35W). The site is easily accessed from principal population centers via IH-35W. In addition to IH-35W, County Roads 107, 204, and 401 as well as Farm to Market road 2415 are utilized to access the landfill. In general, landfill vehicles originating north of the site utilize the IH-35W southbound frontage road to the landfill entrance road; and landfill vehicles originating south of the site use the IH-35W northbound frontage road, cross IH-35W on the FM 107 bridge, then travel north on the IH-35W southbound frontage road to the landfill entrance road. Local hauling vehicles utilize the referenced county and farm-to-market roads to access the IH-35W frontage roads and landfill.

A traffic impact study was prepared by WCG in January 2022 to evaluate the continued development of the Turkey Creek Landfill on local roadways and traffic. The traffic study is included in Parts I/II, Appendix I/IID.

In summary, the traffic study concludes that access roads within 1 mile of the landfill provide adequate access to the site. Coordination with TxDOT regarding traffic and location restrictions is included in Appendix I/IIB (TxDOT Tab).

8.2 Airport Safety

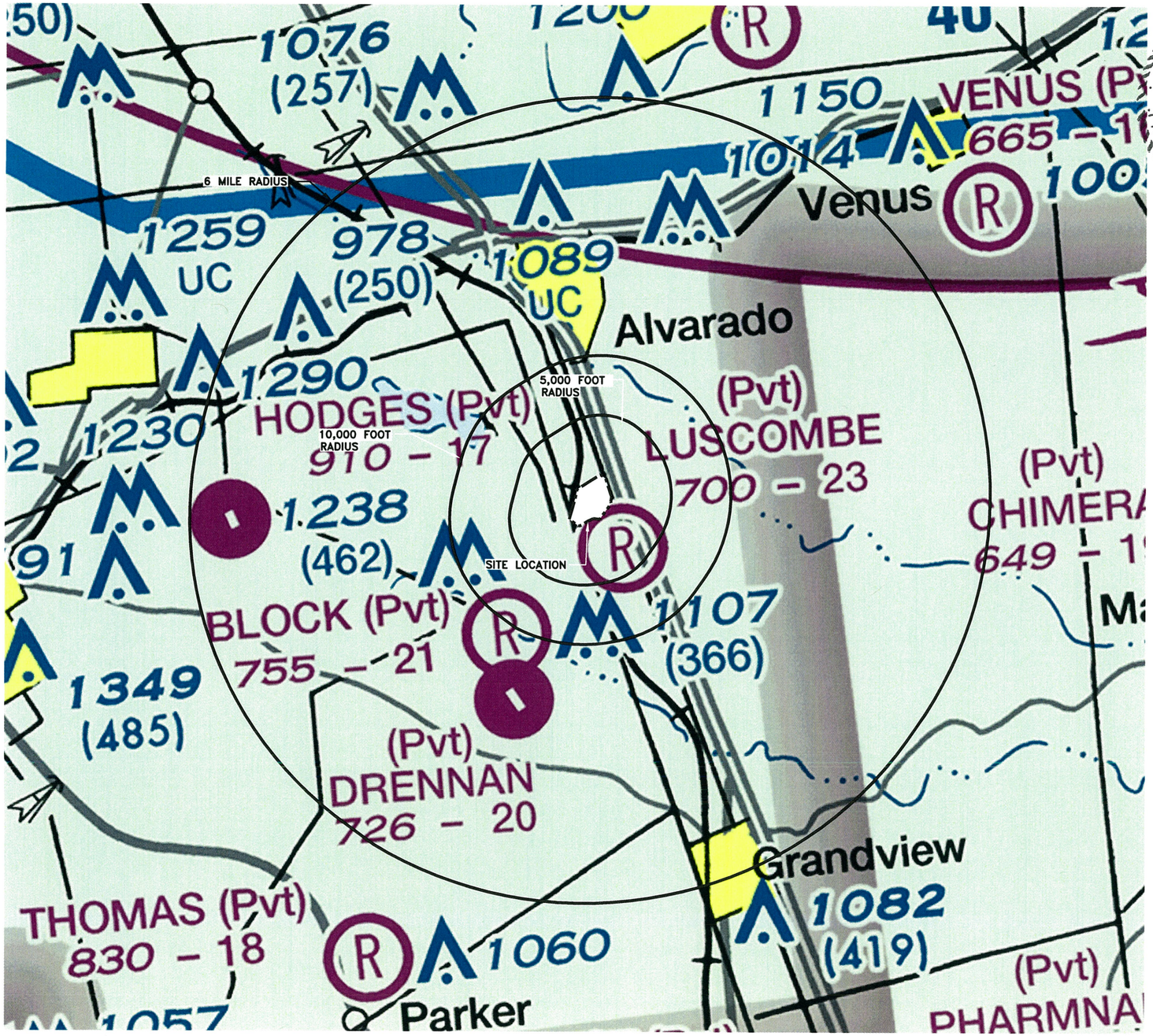
TCEQ distance restrictions set forth in Title 30 TAC §330.545 require municipal solid waste disposal facilities seeking vertical expansions located within 10,000 feet of any runway end used by turbojet aircraft or within 5,000 feet of any runway end used by piston-engine aircraft to demonstrate that the units are designed and operated so that the municipal solid waste landfill unit does not pose a bird hazard to aircraft. Title 30 TAC §330.545(d) further requires that landfill facilities within a 6-mile radius of any small general service airport runway or within a five-mile radius of any large general public commercial airport shall be critically evaluated to determine if an incompatibility exists.

As shown on Figure I/II-8.1, one privately-owned airport is identified as being located within the 5,000-foot radius of the landfill (Luscombe Acres Airport). Luscombe is a private use, turf runway airport. A second airport (Block Ranch Airport) is shown as being located within the 10,000-foot radius of the landfill. However, Block also is a private use, turf runway airport, and not suitable for turbojet aircraft. Also as shown on the map, two additional airports (Drennan Airport and Hodges Air Field) are identified as being located within the 6-mile radius of the landfill. Both airports are private use with asphalt runways.

The FAA reviewed the proposed changes for this application to determine the potential for the site to be a hazard to air navigation. As documented in letters, the FAA has determined that the proposed changes do not pose a hazard to air navigation (refer to Appendix I/IIB for more information).

In addition, Title 30 TAC §330.545(b) requires that small general service airports located within a 6-mile radius of a lateral expansion be notified of the proposed expansion. Title 30 TAC §330.545(b) also requires that large general public commercial airports located within a 5-mile radius of a lateral expansion be notified of the proposed expansion. Additionally, consistent with Title 30 TAC §330.545(d), landfills disposing of putrescible waste shall not be located in areas where the attraction of birds can cause a significant bird hazard to low-flying aircrafts. As shown on Figure 1/II-8.1, no small general service airports are located within a 6-mile radius of the site and no large general public commercial airports are located within a 5-mile radius of the site.

The Airport Safety Location Restriction is included in Appendix I/IIC.



STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED
PROFESSIONAL ENGINEER

N

0 5,000 10,000
SCALE IN FEET

AIRPORTS

Other than hard-surfaced runways — Seaplane Base

Hard-surfaced runways 1500 ft. or greater

Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, or VORTAC location.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification. Airports may be public or private.

ADDITIONAL AIRPORT INFORMATION

(R) Private "(Pvt)" - Non-public use having emergency or landmark value.

Military - Other than hard-surfaced. All military airports are identified by abbreviations AFB, NAS, AAF, etc. For complete airport information consult DOD FLIP.

(H) Heliport Selected

(U) Unverified

Abandoned - paved having landmark value, 3000 ft. or greater

(F) Ultralight Flight Park Selected

Services-fuel available and field tended during normal working hours depicted by use of ticks around basic airport symbol. (Normal working hours are Mon thru Fri 10:00 A.M. to 4:00 P.M. local time.) Consult A/FD for service availability at airports with hard-surfaced runways 1500 ft. or greater.

☆ Rotating airport beacon in operation Sunset to Sunrise.

RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES

122.1R 122.6 123.6
OAKDALE (T)
362 *116.8 OAK

Underline indicates no voice on this frequency.

★ - Operates less than continuous or On-Request.

(T) - TWEB (H) - HIWAS

(A) - ASOS/ AWOS

122.1R
MIAMI

FSS providing voice communication

122.1R
CHICAGO CHI

Heavy line box indicates Flight Service Station (FSS). Frequencies 121.5, 122.2, 243.0, and 255.4 (Canada - 121.5, 126.7 and 243.0) are normally available at all FSSs and are not shown above boxes. All other frequencies are shown. For Local Airport Advisory use FSS frequency 123.6.

R - Receive only

Frequencies above thin line box are remoted to NAVAID site. Other frequencies at FSS providing voice communication may be available as determined by altitude and terrain. Consult Airport/Facility Directory for complete information.

TOPOGRAPHIC INFORMATION

Roads

35 40 Road Markers

Railroad

Bridges And Viaducts

Power Transmission Lines

Aerial Cable

Landmark Feature - stadium, factory, school, golf course, etc.

Outdoor Theatre

Lookout Tower P-17 (Site Number) 618 (Elevation Base of Tower)

CG Coast Guard Station

Race Track

Tank - water, oil or gas

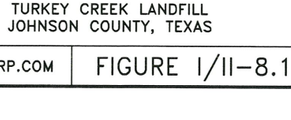
Oil Well • Water Well

Mines And Quarries

Mountain Pass

11823 (Elevation of Pass)

(Pass symbol does not indicate a recommende route or direction of flight and pass elevation d not indicate a recommended clearance altitude Hazardous flight conditions may exist within ar near mountain passes.)



OBSTRUCTIONS

1000 ft. and higher AGL — below 1000 ft. AGL

or Group Obstruction

or Obstruction with high-intensity lights May operate part-time

2049 (1149) UC

Elevation of the top above mean sea level

Height above ground

Under construction or reported: position and elevation unverified

NOTICE: Guy wires may extend outward from structures.

NOTES:

1. THIS MAP REPRODUCED FROM THE FAA DALLAS–FORT WORTH SECTIONAL AERONAUTICAL CHARTS DATED MARCH 1, 2018.
2. THERE ARE NO PUBLIC AIRPORTS WITHIN A 10,000 FOOT RADIUS OF THE SITE.
3. THERE ARE FOUR SMALL PRIVATELY OWNED, PRIVATE USE AIRPORTS WITHIN A 6–MILE RADIUS OF THE SITE.

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☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 02/2022
FILE: 0771–368–11
CAD: 8.1–AREA AIRPORTS.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
AREA AIRPORTS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

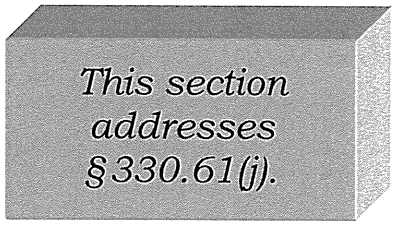
WWW.WCGRP.COM

FIGURE I/II–8.1

O:\0771\368\EXPANSION 2021\PARTS I–II\FIG 8.1–AREA AIRPORTS.dwg, rarrington, 1:2

9 GENERAL GEOLOGY AND SOILS STATEMENT

9.1 Geology and Soils



According to the Bureau of Economic Geology (Geologic Atlas of Texas: Dallas Sheet, 1987), the Turkey Creek Landfill is located on an outcrop of Woodbine Formation which regionally consists predominately of sand, sandstone, clay, shale, and lignite deposited in fluvial and marine deltaic environments.

The Woodbine Formation is classified by the Texas Water Development Board as a minor Texas aquifer and unconformably overlies the Washita and Fredericksburg group sediments. The Washita Group sediments are described as predominately low permeability limestone, marl, and clay deposited in marine environment which function regionally as a lower confining unit to the overlying saturated Woodbine Aquifer.

Based on the lithologic logs from 134 facility exploratory borings and nearby water well logs, subsurface geology can be divided into three site-specific stratigraphic units. The geologic deposits at the site include (in descending order): a surficial Upper Sand unit, an underlying Bounding Shale unit, and an underlying and interjecting Lower Sand unit. In addition, the regional geologic information and local water well logs identify the Grayson Marl Formation as the lower confining unit to the saturated Woodbine Formation sediments. Regional and site-specific geologic and hydrogeologic conditions are discussed in detail by investigations included in Appendix IIIG of Part III.

9.2 Fault Areas

Turkey Creek Landfill and the surrounding area were examined for the presence of geologic faulting in conformance with Title 30 TAC §330.555 criteria. This included a physical inspection of the site and surrounding area, review of previous fault investigations, available literature and maps, and a current aerial photograph.

No unusual scarps or topographic breaks were interpreted within 200 feet of the site. No evidence of faulting was found associated with on-site or adjacent roadways. No structural influence of stream courses was observed within 200 feet of the proposed permit boundary. In addition, no unusual relief or topographic features, such as sag ponds, truncated alluvial spurs, or offset tributary alignments, were observed. Therefore, the site is in compliance with the fault areas location restriction. The certification of compliance with the fault area location restriction is presented in Appendix I/IIC.

9.3 Seismic Impact Zones

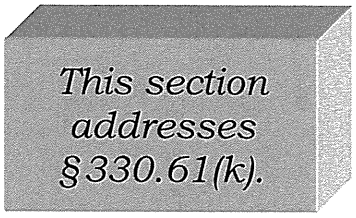
The seismic impact zone location restriction defined by Title 30 TAC §330.557 is an area with a 10 percent or greater probability that the maximum horizontal acceleration in rock, expressed as a percentage of the earth's gravitational pull, will exceed 0.10g in 250 years. According to the U.S.GS earthquake hazard data, the site-specific maximum horizontal seismic acceleration estimated at a 10 percent probability of exceedance in a 250-year time period is 0.037g (3.7 percent of the force of gravity as estimated from the 2018 U.S.GS seismic impact zone map). As such, the U.S.GS-derived site-specific horizontal acceleration is lower than the 10 percent of the force of gravity or greater horizontal acceleration required for seismic impact zone classification. Drawing I/IIC-4 in Appendix I/IIC presents the 2018 U.S.GS seismic impact zone map. As shown on this drawing, the site is not located within a seismic impact zone. For these reasons, the Turkey Creek Landfill is in compliance with the seismic impact zone location restriction. The seismic impact zone location restriction demonstration is included in Appendix I/IIC.

9.4 Unstable Areas

Title 30 TAC §330.359 notes that an unstable area is defined to be a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of a landfill's structural components responsible for preventing releases from the landfill: unstable areas can include poor foundation conditions, areas susceptible to mass movement, and karst terrains. As discussed in Appendix I/IIC, Section 10, the bottom liner is founded within Woodbine Formation shale and sand facies that will provide an excellent foundation layer, the final cover system is designed to withstand the predicted differential settlement, and the stability analysis shows that each landfill component will be stable and no mass movements will occur. The unstable areas location restriction demonstration is included in Appendix I/IIC.

10 GROUNDWATER AND SURFACE WATER STATEMENT

10.1 Groundwater Statement



Groundwater conditions at the site were determined using data from piezometers and monitor wells that are part of the approved Subtitle D groundwater monitoring system. Details and logs of on-site borings, monitor wells and piezometers, as well as potentiometric surface contour maps, are provided in Part III, Appendix IIIG. The uppermost aquifer, for groundwater monitoring purposes, occurs within the upper Woodbine Formation sediments. The uppermost aquifer is underlain by marl and limestone of the Washita and Fredericksburg groups. Based on local water well logs, this aquiclude is about 300 feet thick in the vicinity of Turkey Creek Landfill.

10.2 Surface Water Statement

The Turkey Creek Landfill permit boundary is located near the headwater of Turkey Creek. The permit boundary area drains to Turkey Creek on the northwest and northeast sides of the site and to an unnamed tributary of Turkey Creek on the southeast side of the site. Turkey Creek discharges to North Fork Creek approximately 2 miles east of the landfill.

For the proposed expansion, the final cover system will include erosion control structures to effectively minimize erosion of final cover soils. The proposed drainage system also includes a perimeter channel system and detention ponds that will convey stormwater collected from the landfill area. The perimeter channels have been designed to convey peak runoff generated by the 25-year frequency storm event. The detention ponds have been designed to release the collected stormwater at a rate that is consistent with the existing permitted drainage conditions. A detailed drainage design and analysis demonstrating that the existing permitted drainage patterns will not be adversely altered is included in Appendix IIIF.

The site is designed to prevent discharge of pollutants into waters of the state or waters of the United States, as defined by the Texas Water Code and the Federal

Clean Water Act, respectively. The Turkey Creek Landfill is subject to TCEQ's storm water permit requirements. A copy of the TPDES permit is included in Appendix I/IIE. Surface water monitoring will be conducted consistent with TPDES requirements. Given the above, the applicant understands and is in full compliance with TPDES requirements under the Clean Water Act, Section 402 as amended.

11 FLOODPLAINS AND WETLANDS STATEMENT

11.1 Floodplains Statement

As noted in Section 10.2, the floodplain of Turkey Creek forms the north boundary of the site. The landfill expansion includes the relocation of two tributaries of Turkey Creek to the north and southeast of the existing disposal footprint. A CLOMR for the expansion of the landfill has been submitted to FEMA for review. No portion of the waste disposal area will be located in the 100-year floodplain, and the perimeter berm will provide over 3 feet of freeboard between the 100-year floodplain and the top of the berm.

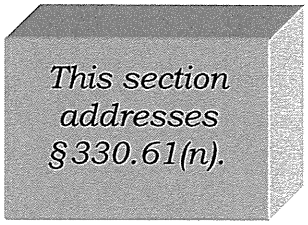
Compliance with the floodplain location restrictions is further discussed in Appendix I/IIC (each of the 4 items listed under Title 30 TAC §330.63(c)(2)(D) are addressed in Appendix I/IIC, Section 4).

11.2 Wetlands Statement

A Jurisdictional Waters of the U.S. Report for the Turkey Creek Landfill was prepared by WCG in April 2021. The report included the assessment of potential waters of the U.S. located within the permit boundary and the proposed waste footprint. This permit amendment proposes a horizontal and vertical expansion to the currently permitted waste disposal area within the currently approved permit boundary. The property within the currently approved permit boundary of the Turkey Creek Landfill was evaluated for compliance with wetlands provisions, including the determination and identification requirements in Title 30 TAC §330.61(m)(2) and (3) and the wetlands location restriction in Title 30 TAC §330.553(b). The assessment concluded that the horizontally and vertically expanded landfill unit at the Turkey Creek Landfill will not be located within jurisdictional wetlands or waters of the U.S., and the proposed development of the site complies with the location restrictions.

The jurisdictional waters report was transmitted to the U.S. Army Corps of Engineers (USACE) requesting concurrence from the USACE that the horizontal and vertical expansion does not impact jurisdictional waters. A copy of the jurisdictional waters report, and correspondence with the USACE are included in Appendix I/IIB.

12 PROTECTION OF ENDANGERED SPECIES



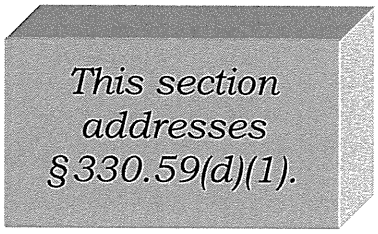
A Biological Assessment Report for the Turkey Creek Landfill was prepared by WCG in August 2021. The report, including the findings related to threatened or endangered species and their critical habitats was sent to the U.S. Fish and Wildlife Service (FWS) and the Texas Parks and Wildlife Department (TPWD), seeking concurrence that the project would not impact threatened or endangered species, or their critical habitat. Correspondence with the FWS and TPWD is included in Appendix I/IIB.

The 2021 WCG study concluded that the area within the landfill permit boundary does not provide habitat for any threatened or endangered species. Additionally, no federally-regulated critical habitat was identified on the permit property.

Therefore, it was concluded that the proposed horizontal and vertical expansion of the Turkey Creek Landfill will not result in the destruction or adverse modification of the critical habitat of any threatened or endangered species, or cause or contribute to the taking of any threatened or endangered species.

Given the above, the facility is in compliance with all applicable federal, state, and local laws regarding threatened or endangered species.

13 LEGAL DESCRIPTION



A legal description of the 219.6-acre permit boundary is included on the following page. This area is shown on the attached drawing.

Property records indicate the area within the permit boundary is owned by IESI TX Landfill, LP, which has changed its legal name to Texas Regional Landfill Company, LP. Current ownership records for the property may be found in Johnson County Real Property records.

LEGAL DESCRIPTION

Tract 1:

Being a tract of land located in the D. S. Henderson Survey, Abstract 334 and the Benaiah Jones Survey Abstract No. 449, Johnson County, Texas and being a portion of that tract of land described in Volume 1800, Page 25 and being more particularly described as follows;

Beginning at a ½ inch iron rod in the North line of the D. S. Henderson, Abstract 334, said point being North 60 degrees 10 minutes 47 seconds East, a distance of 3603.06 feet from the Northwest corner of said survey;

Thence South 48 degrees 26 minutes 00 seconds East, a distance of 525.43 feet to a ½ inch iron rod in the West R.O.W. line of I. H. 35 (a 175.00 foot R. O. W.);

Thence South 15 degrees 55 minutes 00 seconds East, with the West R. O. W. line of I. H. 35, a distance of 989.62 feet to a 1/2 inch iron rod;

Thence South 15 degrees 55 minutes 00 seconds East, continuing the West R.O.W. line of I. H. 35 a distance of 602.37 feet to an ½ inch iron rod at an angle point;

Thence South 08 degrees 08 minutes 00 seconds West, a distance of 208.49 feet to a ½ inch iron rod at an angle Point;

Thence South 14 degrees 05 minutes 00 seconds West a distance of 232.50 feet to a 1/2 inch iron rod at an angle point;

Thence South 13 degrees 52 minutes 25 seconds East, a distance of 145.35 feet to a found concrete monument and a point of leaving the I. H. 35 R. O. W.;

Thence South 37 degrees 32 minutes 43 seconds West, a distance of 1642.53 feet to a ½ inch iron rod at an angle point in County Road No. 313 (Greenfield Road);

Thence North 77 degrees 45 minutes 41 seconds West, continuing with said County Road a distance of 225.00 feet to a ½ inch iron rod at an angle point;

Thence North 82 degrees 53 minutes 28 seconds West, a distance of 314.01 feet to a 3/8 inch iron rod at an angle point;

Thence South 87 degrees 46 minutes 55 seconds West, a distance of 477.42 feet to a ½ inch iron rod for an angle point;

Thence South 60 degrees 25 minutes 18 seconds West, a distance of 883.78 feet to a ½ inch iron rod for an angle point; Thence South 70 degrees 44 minutes 01 seconds West, a distance of 247.05 feet to a ½ inch iron rod at an angle point;

Thence North 51 degrees 26 minutes 27 seconds West, leaving said County Road, a distance of 975.66 feet to a ½ inch iron rod in the East Row line of the MKTRR (100 foot ROW) for a corner;

Thence North 18 degrees 04 minutes 22 seconds East, with the East ROW line of the MKTRR, a distance of 820.99 feet to a 3/8 inch iron rod;

Thence North 18 degrees 06 minutes 17 seconds East, a distance of 1014.96 feet to a ½ inch iron rod at the Point of a curve to the left having a central angle of 7 degrees 35 minutes 08 seconds a radius of 5799.60 feet and a radius bearing North 72 degrees 39 minutes 28 seconds West;

Thence with the arc of said curve a distance of 769.51 feet to a ½ inch iron rod at the point of leaving said curve and the MKTRR Row;

Thence North 80 degrees 10 minutes 47 seconds East, a distance of 2327.28 feet to a point of beginning and containing 219.597 acres of land more or less.

Tract 2:

Being all that certain tract or parcel of land lying in the Daniel S. Henderson Survey, Abstract No. 334, of Johnson County, Texas and being a portion of that certain tract of land conveyed by Harry W. Ellis and Adaline Mae Ford to Wayne A. Coble, Ralph T. Cravens, and Benjamin L. Doskocil according to the Warranty Deed filed of record in Volume 979, Page 870, of the Real Records, Johnson County, Texas and being more particularly described by metes and bounds as follows;

Beginning at an iron rod found for corner of the Northwest corner of said Cravens Tract and the Southwest corner of a tract of land deeded to Willa Porter recorded in Volume 2738, Page 948, at the Deed Records, Johnson County, Texas and also being the Northwest corner of the tract herein described;

Thence North 70 degrees 07 minutes 17 seconds East, along the North line of said Porter tract and generally along a fence line, a distance of 638.86 feet to an iron rod found for corner;

Thence North 67 degrees 41 minutes 45 seconds East, a distance of 354.48 feet to a point in the approx center of Turkey Creek and being the most Northerly Northeast corner of this tract;

Thence along said Turkey Creek, the following courses and distances:

South 49 degrees 12 minutes 48 seconds East, 200.98 feet;
South 10 degrees 00 minutes 00 seconds West, 200.00 feet;
South 62 degrees 21 minutes 14 seconds East, 107.67 feet;
North 51 degrees 09 minutes 27 seconds East, 220.91 feet;
South 44 degrees 03 minutes 20 seconds East, 277.00 feet;
South 54 degrees 58 minutes 38 seconds East, 90.14 feet to a fence corner post for corner, said corner being the Northwest corner of a 16.75 acre Moore tract;

Thence South 30 degrees 12 minutes 05 seconds East, along the West line of said Moore Tract, and generally along a fence line a distance of 945.72 feet an iron rod found for corner;

Thence South 29 degrees 33 minutes 23 seconds East, along the West line of a 16.75 acre Atlas tract and generally along a fence, a distance of 959.28 feet to an iron rod found for corner, said corner being the Southwest corner of said Atlas tract;

Thence North 75 degrees 40 minutes 32 seconds East, along the South line of said Atlas tract, a distance of 349.70 feet to a point for corner in a fence line, said point being in the East line of a 43.70 acre Versteegh tract;

Thence South 29 degrees 38 minutes 54 seconds East, along the West line of said Versteegh tract and generally along a fence line a distance of 1254.57 feet to an iron rod found at a fence corner in the North line of County Road No. 107 and being the Southeast corner of this tract;

Thence South 47 degrees 03 minutes 36 seconds West, a distance of 30.00 feet to a point for a corner in the center of said County Road No. 107 and being in a non tangent curve to the left;

Thence along the right of way line of said County Road 107, the following courses and distances;

Along said curve to the left, whose radius is 838.93 feet, and whose central angle is 46 degrees 25 minutes 27 seconds and having an arc distance of 679.74 feet;

South 86 degrees 45 minutes 16 seconds West, a distance of 1373.69 feet to a point for corner, and being the Southwest corner of this tract, and being a Southeast corner of a 10.00 acre tract surveyed out on this same day;

Thence North 01 degrees 17 minutes 08 seconds West, along the East line of said 10.00 acre tract, a distance of 556.68 feet to an iron rod set for corner;

Thence North 55 degrees 39 minutes 14 seconds West, with the North line of said 10.00 acre tract, to a 2 inch iron stake set for corner;

Thence South 29 degrees 34 minutes 14 seconds West, with a Westerly line of said 10.00 acre tract, a distance of 881.68 feet to an iron rod found for corner in the Easterly line of Interstate Highway 35-W;

Thence along the easterly line of said Highway the following courses and distances;

North 31 degrees 56 minutes 00 seconds West, 265.79 feet;
North 19 degrees 25 minutes 00 seconds West, 164.00 feet;

North 15 degrees 53 minutes 49 seconds West, 399.36 feet to a concrete monument;

Thence North 09 degrees 40 minutes 43 seconds West, a distance of 129.70 feet to an iron pin found for corner, and being the Southwest corner of a 1.72 acre tract of land recorded in Volume 2447, Page 886, of the Deed Records, of Johnson County, Texas;

Thence North 55 degrees 49 minutes 06 seconds West, generally along a fence line and along the South line of said 1.72 acre tract, a distance of 387.95 feet to an iron rod found for a corner;

Thence North 32 degrees 51 minutes 06 seconds West, a distance of 80.62 feet to an iron rod found for a corner;

Thence North 78 degrees 27 minutes 00 seconds West, along the North line of said 1.72 acre tract, and generally along a fence, a distance of 391.47 feet to an iron rod found for corner in the East line of said Interstate Highway 35-W;

Thence North 15 degrees 38 minutes 34 seconds West, 1215.38 feet to the Point of Beginning and containing 115.09 acres of land more or less.

THIS DESCRIPTION DESCRIBES ALL THAT PROPERTY DESCRIBED IN THE TITLE COMMITMENT IDENTIFIED AS STEWART TITLE GUARANTY COMPANY COMMITMENT No. 10813812V-7 BEARING AN EFFECTIVE DATE OF JANUARY 28, 2009.

FLOOD NOTE:

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE(S) X & AE OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL No. 48251C0150F, WHICH BEARS AN EFFECTIVE DATE OF 9-27-91 AND IS PARTIALLY IN A SPECIAL FLOOD HAZARD AREA, BY CONTACT DATED 1-26-09 TO THE NATIONAL FLOOD INSURANCE PROGRAM http://www.fema.gov/ WE HAVE LEARNED THIS COMMUNITY DOES CURRENTLY PARTICIPATE IN THE PROGRAM. NO FIELD SURVEYING WAS PERFORMED TO DETERMINE THIS ZONE AND AN ELEVATION CERTIFICATE MAY BE NEEDED TO VERIFY THIS DETERMINATION OR APPLY FOR A VARIANCE FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

Items Corresponding to Schedule B

10	10.	The following matters and all terms of the documents creating or offering evidence of the matters:
10b	b.	INTENTIONALLY DELETED
10c	c.	Easement from Louise Powers to Sinclair Pipe Line Co. by instrument dated 1/16/58, filed 3/6/58, recorded in Volume 407, Page 1, Real Property Records, Johnson County, Texas. Tract 2, unable to locate – SURVEYOR IS UNSURE IF THIS ITEM AFFECTS THE SUBJECT PROPERTY AS IT CONTAINS NO METES AND BOUNDS DESCRIPTION.
10d	d.	Easement from Turkey Creek Landfill Tx, LP to United Electric Cooperative Services, Inc. by instrument dated 4/8/02, filed 4/26/02, recorded in Volume 2818, Page 341, Real Property Records, Johnson County, Texas. Tract 1 affects subject property – ITEM APPEARS TO AFFECT THE SUBJECT PROPERTY, HOWEVER IT CANNOT BE PLOTTED AS IT CONTAINS NO METES AND BOUNDS DESCRIPTION.
10e	e.	Easement from Turkey Creek Landfill Tx, LP to Southwestern Gas Pipeline, Inc. by instrument dated 8/27/05, filed 8/2/05, recorded in Volume 3588, Page 726, Real Property Records, Johnson County, Texas. Tract 2 as shown on survey dated 1/28/09 prepared by Bock & Clark, Corp. – ITEM AFFECT THE SUBJECT PROPERTY AND IS PLOTTED.
10f	f.	INTENTIONALLY DELETED
10g	g.	Easement from Turkey Creek Landfill TX, LP to J-W Gathering Company by instrument dated 11/2/07, filed 12/6/07, recorded in Volume 4247, Page 148, Real Property Records, Johnson County, Texas. Tract 2 as shown on survey dated 1/28/09 prepared by Bock & Clark, Corp. – ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED.
10h	h.	Easement from J. C. Rayburne and wife Lillian Pauline Rayburne to Sinclair Pipeline Company by instrument dated 12/2/55, filed 12/14/55, recorded in Volume 405, Page 217, Real Property Records, Johnson County, Texas. Tract 1 as shown on survey dated 1/28/09 prepared by Bock & Clark, Corp. – ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED.
10i	i.	Easement from Supreme Waste Control, Inc. to Johnson County Rural Water Supply Corporation by instrument dated 11/20/85, filed 11/25/85, recorded in Volume 1154, Page 171, Real Property Records, Johnson County, Texas. Tract 1 affects the subject property – ITEM APPEARS TO AFFECT THE SUBJECT PROPERTY, HOWEVER IT CANNOT BE PLOTTED AS IT CONTAINS NO METES AND BOUNDS DESCRIPTION.
10j	j.	Easement from Emma Catherine Lightfoot et alto Sinclair Pipe Line Company by instrument dated 2/14/58, filed 3/19/58, recorded in Volume 407, Page 144, Real Property Records, Johnson County, Texas. Tract 1 as shown on survey dated 1/28/09 prepared by Bock & Clark, Corp. – ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED.
10k	k.	Power Line Easement dated 2/12/75 executed by Lista Lightfoot et alto J. C. Rayburne et al dated 2-10-75 recorded in Volume 882, Page 777, Real Property Records, Parker County, Texas. Tract 1 as shown on survey dated 1/28/09 prepared by Bock & Clark, Corp. – ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED.
10l	l.	INTENTIONALLY DELETED
10m	m.	Easement from C.E. Neff and wife to The Texas Pipe Line Company by instrument dated 6/20/49, recorded in Volume 369, Page 630, Real Property Records, Johnson County, Texas. Tract 1 affects subject property – SURVEYOR IS UNSURE IF THIS ITEM AFFECTS THE SUBJECT PROPERTY AS IT CONTAINS NO METES AND BOUNDS DESCRIPTION.
10n	n.	Easement from C. E. Neff and wife to The Sinclair Pipe Line Co. by instrument dated 12-5-55, recorded in Volume 406, Page 234, Real Property Records, Johnson County, Texas. Tract 1 affects subject property – SURVEYOR IS UNSURE IF THIS ITEM AFFECTS THE SUBJECT PROPERTY AS IT CONTAINS NO METES AND BOUNDS DESCRIPTION.
10o	o.	Easement from C. E. Neff and wife to Johnson County Water Supply Corporation by instrument dated 11/25/68 recorded in Volume 497, Page 475, Real Property Records, Johnson County, Texas. Tract 1 Blanket easement – ITEM AFFECTS THE SUBJECT PROPERTY AND IS BLANKET IN NATURE.
10p	p.	Easement from F W Coleman et alto State of Texas by instrument dated 8/22/63, recorded in Volume 462, Page 312, Real Property Records, Johnson County, Texas. Tract 1 affects subject property – SURVEYOR IS UNSURE IF THIS ITEM AFFECTS THE SUBJECT PROPERTY AS IT CANNOT BE TIED TO THE SUBJECT PROPERTY.
10q	q.	Easement from Maggie Ingle et alto Sinclair Pipe Line Co. by instrument dated 12-5-55, filed 1-3-58, recorded in Volume 408, Page 242, Real Property Records, Johnson County, Texas. Tract 1 as shown on survey dated 1/26/09 prepared by Bock & Clark, Corp. – ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED.
10r	r.	Easement from Kenneth R. Jahna and wife to Johnson County Water Supply Corporation by instrument dated 8/10/73 filed 9/20/73, recorded in Volume 618, Page 173, Real Property Records, Johnson County, Texas. Tract 1 affects subject property– ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED.
10s	s.	Easement to Texas Pipeline Co. by instrument dated 8/22/49, filed 10/27/49, recorded in Volume 370, Page 412, Real Property Records, Johnson County, Texas. Tract 1 affects subject property– SURVEYOR IS UNSURE IF THIS ITEM AFFECTS THE SUBJECT PROPERTY AS IT CONTAINS NO METES AND BOUNDS DESCRIPTION.
10t	t.	Easement to Johnson County Water Supply Corporation by instrument dated 3/15/79, recorded in Volume 783, Page 143, Real Property Records, Johnson County, Texas. Tract 1 affects subject property– ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED.
10u	u.	Easement by instrument dated 8/17/49, recorded in Volume 389, Page 82 and Volume 389, Page 88, Real Property Records, Johnson County, Texas. Tract 1 as shown on survey dated 1/26/09 prepared by Bock & Clark, Corp. – ITEM AFFECTS THE SUBJECT PROPERTY AND IS PLOTTED.

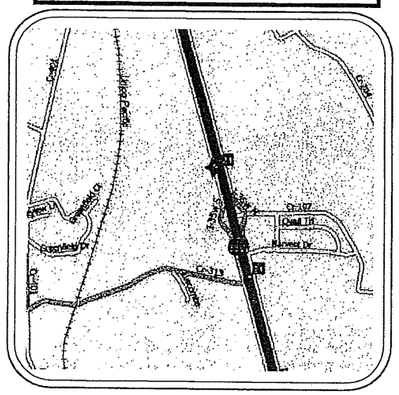
Items Corresponding to Schedule B

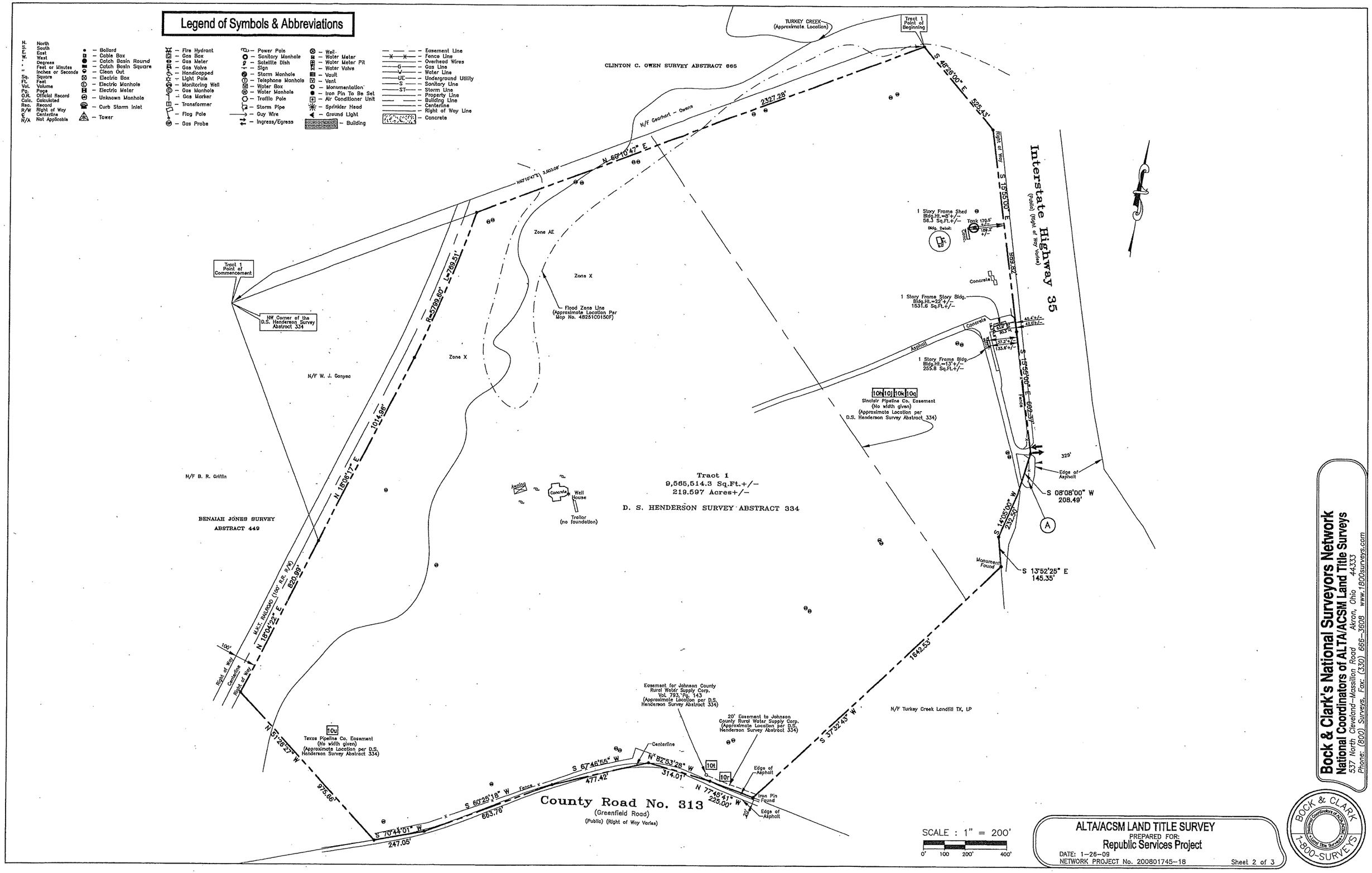
10v	v.	3/2 of the oil, gas and other minerals, royalties, bonuses, rentals and all other rights in connection with same as set forth in instrument dated 1/5/84, filed 1/18/84, executed by Harry Ellis and wife Adaline Mae Ford to Wayne A. Coble, Ralph T. Cravens and Benjamin L. Doskocil, recorded in Volume 979, Page 870, Real Property Records, Johnson County, Texas. The Company makes no representation as to the present ownership of this interest. Tract 2 – PROPERTY DESCRIBED IN THE LEGAL DESCRIPTION LIES WITHIN THE SUBJECT PROPERTY.
10w	w.	An oil, gas and mineral lease dated 1/22/05, filed 3/10/05, executed by Turkey Creek Landfill Tx LP as lessor, in favor of Stroud Energy Ltd. as lessee, and recorded in Volume 3488, Page 291, Real Property Records, Johnson County, Texas. Tract 2 – PROPERTY DESCRIBED IN THE LEGAL DESCRIPTION LIES WITHIN THE SUBJECT PROPERTY.
10z	z.	All of the oil, gas and other minerals, the royalties, bonuses, rentals and all other rights in connection with same as set forth in instrument dated 8/29/85, filed 10/1/85, recorded in Volume 1142, Page 557, Real Property Records, Johnson County, Texas. The Company makes no representation as to the present ownership of this interest. Tract 1 – PROPERTY DESCRIBED IN THE LEGAL DESCRIPTION LIES WITHIN THE SUBJECT PROPERTY.
10aa	aa.	INTENTIONALLY DELETED
10bb	bb.	INTENTIONALLY DELETED
10cc	cc.	INTENTIONALLY DELETED
10dd	dd.	INTENTIONALLY DELETED
10ee	ee.	Terms, conditions and stipulations in that certain unrecorded Landfill Agreement dated 9/19/02, by and between Thurmen Transportation, Inc., a Texas corporation, and Turkey Creek Landfill TX, L.P., a Delaware corporation. Tract 2 – THIS ITEM AFFECTS THE SUBJECT PROPERTY AND IS BLANKET IN NATURE.
10ff	ff.	INTENTIONALLY DELETED
10gg	gg.	INTENTIONALLY DELETED

Zoning Information

STATUS	ZONING DATED, CURRENT		DISTRICT	NONE
ITEM	REQUIRED	OBSERVED	SOURCE INFORMATION	JOHNSON CO. ZONING
PERMITTED USE	NONE	LANDFILL	ADDRESS	1 N. MAIN STREET
MINIMUM LOT AREA	NONE	14,578,834 SQ.FT.+/- (TOTAL)	PERSON CONTACTED	NOT AVAILABLE
MINIMUM FRONTAGE	NONE	SEE SURVEY	DATE CONDUCTED	1-28-09
MINIMUM LOT WIDTH	NONE	SEE SURVEY	PHONE/FAX NUMBER	817-558-6380
MAX. BUILDING COVERAGE	NONE	.02%+/-	EMAIL ADDRESS	NOT AVAILABLE
MINIMUM SETBACKS FRONT	NONE	NONE	NOTES: JOHNSON COUNTY DOES NOT HAVE ZONING.	
MINIMUM SETBACKS SIDE	NONE	NONE		
MINIMUM SETBACKS REAR	NONE	NONE		
MAX. BUILDING HEIGHT	NONE	8', 13' & 22'		
PARKING REGULAR	NONE	0		
PARKING HANDICAP	NONE	0		
PARKING TOTAL	NONE	0		

Vicinity Map


Cravens Rd
Moore Rd
Turkey Creek
Creek
Quail Trl
Harvest Dr
Cr 107
Cr 313
Cr 313
Cr 107
Cr 313
Cr 107
Cr 313
Cr 107

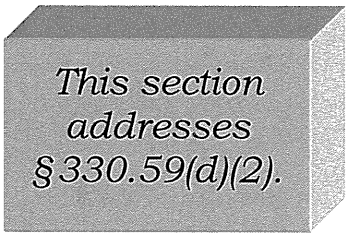


ALTA/ACSM LAND TITLE SURVEY
PREPARED FOR:
Republic Services Project
DATE: 1-26-09
NETWORK PROJECT No. 200801745-18
Sheet 2 of 3

Bock & Clark's National Surveyors Network
National Coordinators of ALTA/ACSM Land Title Surveys
537 North Cleveland-Massillon Road Akron, Ohio 44333
Phone: (800) Surveys, Fax: (330) 666-3608 www.1800surveys.com

14 PROPERTY OWNER AFFIDAVIT

The property owner affidavit from Texas Regional Landfill Company, LP, with attached legal description is included on the following pages.



STATE OF TEXAS §
COUNTY OF JOHNSON §

PROPERTY OWNER'S AFFIDAVIT

On this day, Gary Bartels appeared before me, the undersigned notary public, and after I administered an oath to him, upon his oath he said:

"My name is Gary Bartels. I am the Southern Region Engineer of Texas Regional Landfill Company, LP, and I am authorized to make the following statements on behalf of Texas Regional Landfill Company, LP.

Texas Regional Landfill Company, LP is the owner of certain real property in Johnson County, Texas, including the tract(s) described in Exhibit A attached hereto ("the Property"), which Texas Regional Landfill Company, LP is requesting be included within the permitted area of its Turkey Creek Landfill municipal solid waste landfill facility ("the Facility"), pursuant to amendment of Texas Commission on Environmental Quality Permit No. MSW-1417D.

Texas Regional Landfill Company, LP hereby acknowledges that the State of Texas may hold the property owner of record either jointly or severally responsible for the operation, maintenance, and closure and post-closure care of the Facility on the Property.

Texas Regional Landfill Company, LP hereby acknowledges that the owner of the Property has the responsibility to file in the deed records of Johnson County an affidavit to the public advising that the Property will be used for a solid waste facility prior to the time that the Facility actually begins operating as a municipal solid waste landfill facility on the Property, and to file a final recording upon completion of disposal operations and closure of the landfill units on the Property in accordance with Title 30 TAC §330.19.

Texas Regional Landfill Company, LP hereby acknowledges that the Facility owner or operator and the State of Texas shall have access to the Property during the active life and post-closure care of the Facility for the purpose of inspection and maintenance.

Gary Bartels
Southern Region Engineer
Texas Regional Landfill Company, LP

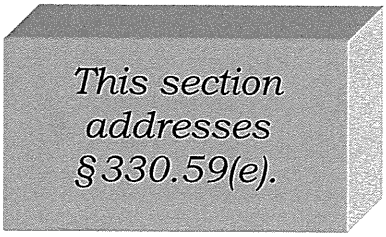
SWORN TO AND SUBSCRIBED before me by Gary Bartels on the 25th day of February, 2022.

HELEN M. HANSON
Notary Public, State of Texas
Comm. Expires 05-17-2025
Notary ID 10180332

Helen M. Hanson
Notary Public

15 LEGAL AUTHORITY

The certificates provided on the following pages document the legal status of the applicant.



FILED
In the Office of the
Secretary of State of Texas
JUN 16 1999
Corporations Section

CERTIFICATE OF LIMITED PARTNERSHIP
OF
IESI TX LANDFILL LP

The undersigned General Partner, desiring to form a limited partnership (the "Partnership") pursuant to Section 2.01 of the Texas Revised Limited Partnership Act (the "Act"), hereby duly execute this Certificate of Limited Partnership, to be effective as of the date of filing with the Secretary of State.

1. The name of the Partnership is IESI TX Landfill LP.

2. The address of the registered office of the Partnership is 6125 Airport Freeway, Suite 202, Haltom City, Texas, 76117, and the name of the registered agent whose business office address will be the same as the registered office address is Charles F. Flood.

3. The address of the principal office of the Partnership in the United States where its partnership records are to be kept or made available under Section 1.07 of the Act is, P.O. Box 162479, Fort Worth, Texas, 76111.

4. The name, the mailing address, and the street address of the business or residence of each general partner of the Partnership is as follows:

NAME	MAILING ADDRESS AND STREET ADDRESS
IESI TX GP Corporation, a Delaware corporation	P O. Box 162479 Fort Worth, Texas 76111

SIGNED on this the 15 day of June, 1999.

GENERAL PARTNER

IESI TX GP Corporation,
a Delaware corporation

By: Stephen Moody
Name: Stephen Moody
Title: Vice President

153149_1 DOC

Corporations Section
P.O.Box 13697
Austin, Texas 78711-3697

David Whitley
Secretary of State

Office of the Secretary of State

The undersigned, as Secretary of State of Texas, does hereby certify that the attached is a true and correct copy of each document on file in this office as described below:

Texas Regional Landfill Company, LP
Filing Number: 12151910

Certificate Of Limited Partnership

June 16, 1999

In testimony whereof, I have hereunto signed my name officially and caused to be impressed hereon the Seal of State at my office in Austin, Texas on January 03, 2019.

David Whitley
Secretary of State

Corporations Section
P.O.Box 13697
Austin, Texas 78711-3697

Rolando B. Pablos
Secretary of State

Office of the Secretary of State

Certificate of Fact

The undersigned, as Secretary of State of Texas, does hereby certify that on June 21, 2018, IESI TX LANDFILL, L.P, a Domestic Limited Partnership (LP) (file number 12151910), changed its name to Texas Regional Landfill Company, L.P

In testimony whereof, I have hereunto signed my name officially and caused to be impressed hereon the Seal of State at my office in Austin, Texas on August 28, 2018.

Rolando B. Pablos
Secretary of State

Corporations Section
P.O.Box 13697
Austin, Texas 78711-3697

Rolando B. Pablos
Secretary of State

Office of the Secretary of State

Certificate of Fact

The undersigned, as Secretary of State of Texas, does hereby certify that on June 12, 2018, IESI TX GP CORPORATION, a DELAWARE, USA, Foreign For-Profit Corporation (file number 12708406), changed its name to WCN TX GP Corporation.

In testimony whereof, I have hereunto signed my name officially and caused to be impressed hereon the Seal of State at my office in Austin, Texas on August 28, 2018.

Rolando B. Pablos
Secretary of State

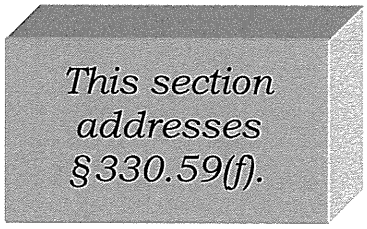
Phone: (512) 463-5555
Prepared by: SOS-WEB

Come visit us on the Internet at http://www.sos.state.tx.us/
Fax: (512) 463-5709
TID: 10254

Dial: 7-1-1 for Relay Services
Document: 833652460002

16 EVIDENCE OF COMPETENCY

16.1 Solid Waste Sites



The Turkey Creek Landfill is owned and operated by Texas Regional Landfill Company, LP (TRLC). TRLC is a Delaware limited partnership qualified to do business in Texas. TRLC is a wholly-owned subsidiary of Waste Connections Lone Star, Inc. Waste Connections Lone Star, Inc. either owns, operates, or maintains a financial interest in the facilities identified in Table 16-1. Waste Connections U.S., Inc. acquires, operates, and develops nonhazardous waste disposal facilities on a national basis and is one of the largest providers of municipal waste services in the United States. Waste Connections, Inc. is a Delaware corporation whose shares are publicly traded on the New York stock exchange. As documented in Waste Connections, Inc. 2021 Annual Report, no person or entity owns 20 percent or more of the company.

16.2 Turkey Creek Landfill Key Personnel

The key personnel involved in the management and operations of the Turkey Creek Landfill are:

Brett O'Connor, Southern Region Engineering Manager

Mr. O'Connor serves as the manager for all engineering and environmental compliance work for landfills, hauling, and transfer operations in the Southern Region. Mr. O'Connor has management and oversite responsibilities for environmental compliance issues for all Waste Connections solid waste hauling, disposal, processing, and transfer facilities in the Southern Region. Mr. O'Connor has over 12 years of experience designing, constructing, and operating municipal solid waste facilities.

Gary Bartels, Southern Region Engineer

Mr. Bartels serves as the Southern Region Engineer, and assists the Southern Region Engineering Manager with all aspects of management and environmental compliance for north Texas landfills, hauling and transfer operations in the

Southern Region area. Mr. Bartels has over 20 years of experience, constructing, and operating municipal solid waste facilities.

Elijah Vandergriff, District Manager

Mr. Vandergriff is responsible for landfill operations in the Dallas/Fort Worth, Texas Area. Responsibilities include financial planning and environmental compliance, as well as other management responsibilities related to landfilling operations.

16.3 Equipment

The equipment listed in Part IV, Site Operating Plan – Table 3.1 is used to operate this site. Additional or different units of equipment may be provided as necessary to enhance operational efficiency. Other equivalent types of equipment may be substituted for this equipment on an as-needed basis.

Table 16-1
Texas Solid Waste Management Facilities
(as of August 2021)

Site Name	Type	Registration/ Permit Number	County	Dates of Operation
Archer City Transfer Station	V	40008	Archer	8/99 to 12/99
Blanco County Transfer Station	V	40007	Blanco	5/97 to 12/03
Blanco County Transfer Station	V	2300	Blanco	12/03 to present
Blossom Prairie Landfill, Inc.	I	2358	Lamar	6/19 to present
Bowie Transfer Station	V	40101	Montague	7/99 to 12/03
Bowie Transfer Station	V	40171	Montague	10/01 to 3/03
Bowie Transfer Station	V	2295	Montague	9/02 to present
Buffalo Creek Landfill	IV	1571A	Wichita	7/99 to present
Brazoria County Transfer Station	V	2235	Brazoria	1992 to present
City of Canton Transfer Station	V	40266	Van Zandt	6/19 to present
City of Vernon Transfer Station	V	40059	Wilbarger	8/99 to present
Crockett Transfer Station (Closed)	V	40033	Houston	3/11 to 3/24/21 – Voluntary Revocation of Registration Issued by TCEQ
East Texas Regional Landfill	I	1249B	Rusk	8/99 to present
Fannon County Transfer Station	V	40290	Fannin	6/19 to present
Fort Worth C&D Landfill	IV	1983C	Tarrant	7/97 to present
Granbury Transfer Station	V	1592A	Hood	8/05 to 12/09
Hardin County Landfill	I	2214A	Hardin	10/02 to 9/17
Hardy Road Transfer Station	V	1578	Harris	1984 to present
Iowa Park Transfer Station	V	40135	Wichita	7/99 to 7/03
Jacksboro Landfill	I	2332	Jack	2023 (anticipated)
Lake Country/Mingus Transfer Station	V	40104	Palo Pinto	6/97 to present
Lake Country/Mingus Transfer Station	V	40201	Palo Pinto	1/04 to present
Minnis Drive Transfer Station	V	40159	Tarrant	9/00 to 11/05
Minnis Drive Transfer Station	V	2306	Tarrant	5/05 to present
Palestine Transfer Station	V	40040	Anderson	3/11 to 6/17
Palestine Transfer Station	V	2389	Anderson	6/17 to present
Pittsburg Transfer Station Facility	V	40174	Camp	6/19 to present
Post Oak Landfill	I	2378	Guadalupe	12/21 to present
Pro Star Transfer Station	V	40277	Polk	2015 to present

Table 16-1 (Continued)
Texas Solid Waste Management Facilities
(as of August 2021)

Site Name	Type	Registration/ Permit Number	County	Dates of Operation
Seabreeze Environmental Landfill	I	1539A	Brazoria	2009 to present
Somervell County Transfer Station	V	40181	Somervell	5/03 to 10/15
Travis County Landfill	IV	1841A	Travis	6/00 to present
Turkey Creek Landfill	I	1417B	Johnson	5/09 to present
Weatherford Landfill	I	47A	Parker	7/03 to present
Weatherford Transfer Station	V	10301	Parker	1/22 to present
Wichita County C&D Landfill (Closed)	IV	1827B	Wichita	7/99 to closure

17 APPOINTMENTS

The appointment prepared for this permit application meets the requirements of Title 30 TAC §330.59(g) and §305.44. The Notice of Appointment is included on the following pages.

This section addresses §330.59(g).

WRITTEN CONSENT OF
THE SOLE GENERAL PARTNER OF
TEXAS REGIONAL LANDFILL COMPANY, LP

The undersigned, being the sole general partner of Texas Regional Landfill Company, LP, a Texas limited partnership (the "Company"), hereby consents to the following actions and adopts the following resolutions:

WHEREAS, the Company's sole general partner wishes to authorize the Company's employee listed below to perform certain administrative tasks on behalf of the Company.

BE IT RESOLVED, that Gary Bartels, Region Engineer of the Company, is hereby authorized to execute by and on behalf of the Company any and all documents required in connection with the permit and regulatory applications, reports, filings, and other documentation relating to and necessary for the day-to-day operations of the Company, including, without limitation, permit renewal applications and reports to be filed with the Texas Commission on Environmental Quality, and all other documentation related thereto, and that any action taken to date involving the foregoing is hereby ratified and approved.

IN WITNESS WHEREOF, the undersigned sole general partner of the Company has duly executed this Written Consent in The Woodlands, Texas on the date set forth below.

GENERAL PARTNER

Dated: January 17, 2020

WCN TX GP CORPORATION

Worthing F. Jackman
President and Chief Executive Officer

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

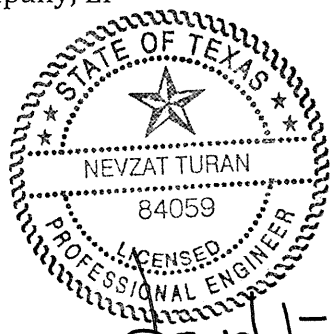
MAJOR PERMIT AMENDMENT APPLICATION

APPENDIX I/IIA
FACILITY LAYOUT MAPS

Prepared for

Texas Regional Landfill Company, LP

February 2022



02/22/22

Prepared by
Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-123

CONTENTS

FIGURE I/II-A.1	General Site Plan
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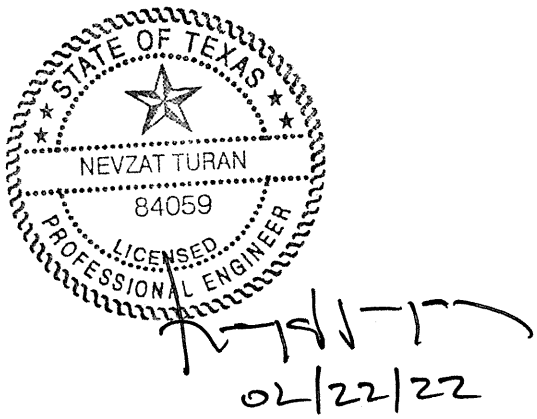
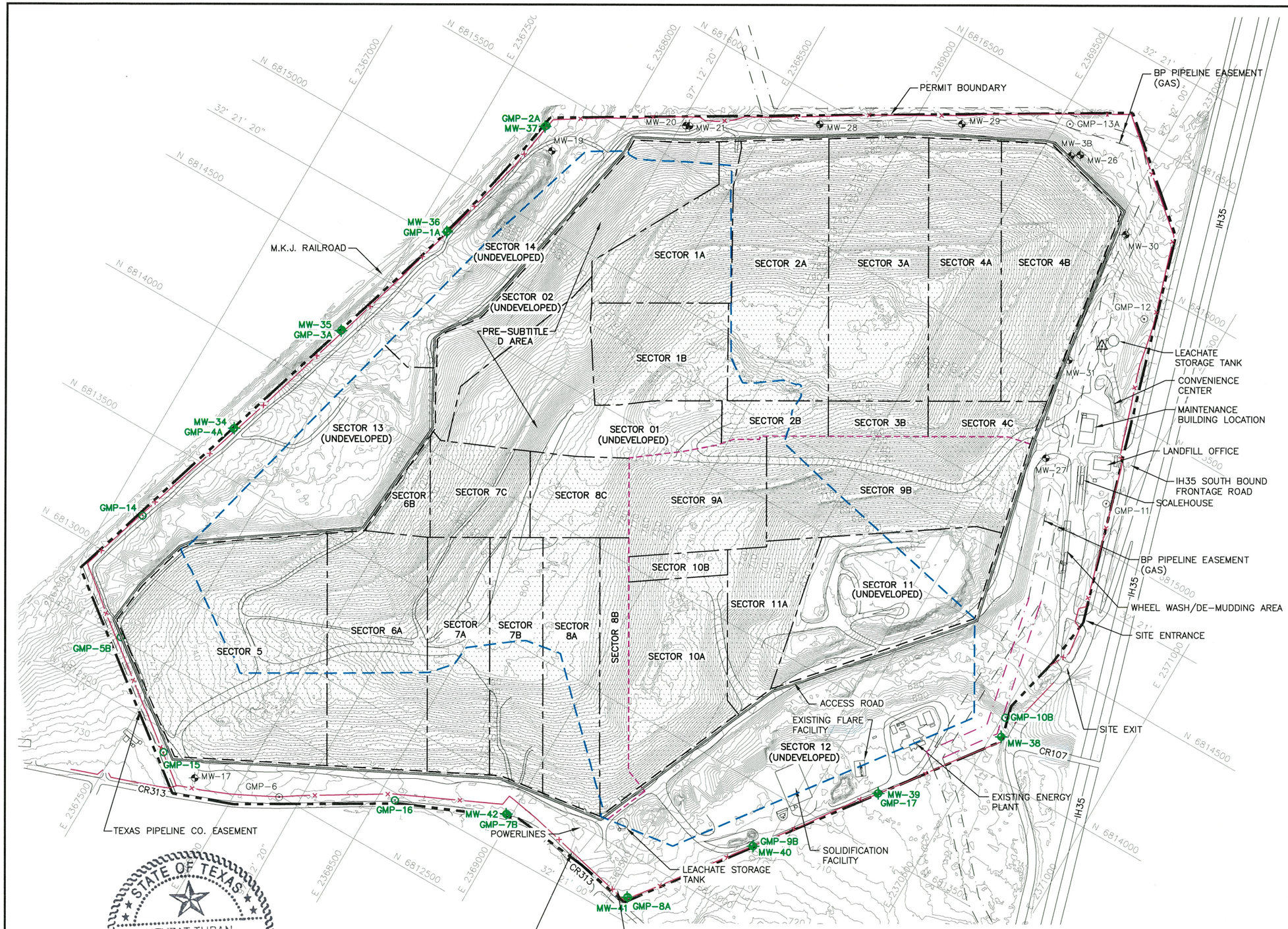
FIGURE I/II-A.3	Cross Section A
FIGURE I/II-A.4	Sector Development Plan I
FIGURE I/II-A.5	Sector Development Plan II
FIGURE I/II-A.6	Sector Development Plan III
FIGURE I/II-A.7	Sector Development Plan IV
FIGURE I/II-A.8	Landfill Completion Plan
FIGURE I/II-A.9	Excavation Plan/Overliner Plan
FIGURE I/II-A.10	Existing Site Entrance Plan
FIFURE I/II-A.10A	Future Site Entrance Plan
FIGURE I/II-A.11	Access Control Plan

This appendix addresses §330.61(d).





LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT (SEE NOTE 6)
- SECTOR BOUNDARY
- EXISTING FENCE (SEE NOTES 7 AND 8)
- EXISTING SUBTITLE D COMPOSITE LINED AREA
- MW-7 — EXISTING GROUNDWATER MONITORING WELL
- GMP-12 — EXISTING LFG GAS MONITORING PROBE
- SITE BENCHMARK (SEE NOTE 2)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. SITE BENCHMARK INFORMATION:

NORTHING	EASTING	ELEVATION (FT-MSL)
N 6815705.71	E 2370100.37	684.64

3. SEQUENCE OF DEVELOPMENT IS PROVIDED ON DRAWINGS I/II-A.4 THROUGH I/II-A.7.
4. UNAUTHORIZED ACCESS TO THE EXISTING FILL AREA WILL BE MINIMIZED BY CONTROLLING ACCESS WITH PERIMETER FENCING (MINIMUM 4-FOOT HIGH, 3-STRAND BARB WIRE FENCES), GATED ENTRANCE, AND NATURAL BARRIERS (e.g., TURKEY CREEK AND DENSE FOLIAGE AND VEGETATION).
5. THE NEWLY PERMITTED AIRSPACE LIMIT OF WASTE REFLECTS THE VERTICAL EXPANSION AREA FOR MSW PERMIT NO.-1417C.
6. THE PROPOSED EASEMENT SHOWN IS FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.
7. EXISTING FENCE IS SHOWN WHERE IT DOES NOT OVERLAP WITH PERMIT BOUNDARY. EXISTING FENCELINE LOCATED WITHIN HEAVILY VEGETATED AREAS WAS APPROXIMATED.
8. EXISTING FENCELINE LOCATED WITHIN HEAVILY VEGETATED AREAS WAS APPROXIMATED.

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER
02/22/22

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 02/2022
FILE: 0771-368-11
CAD: A.1-GENERAL SITE PLAN.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT GENERAL SITE PLAN

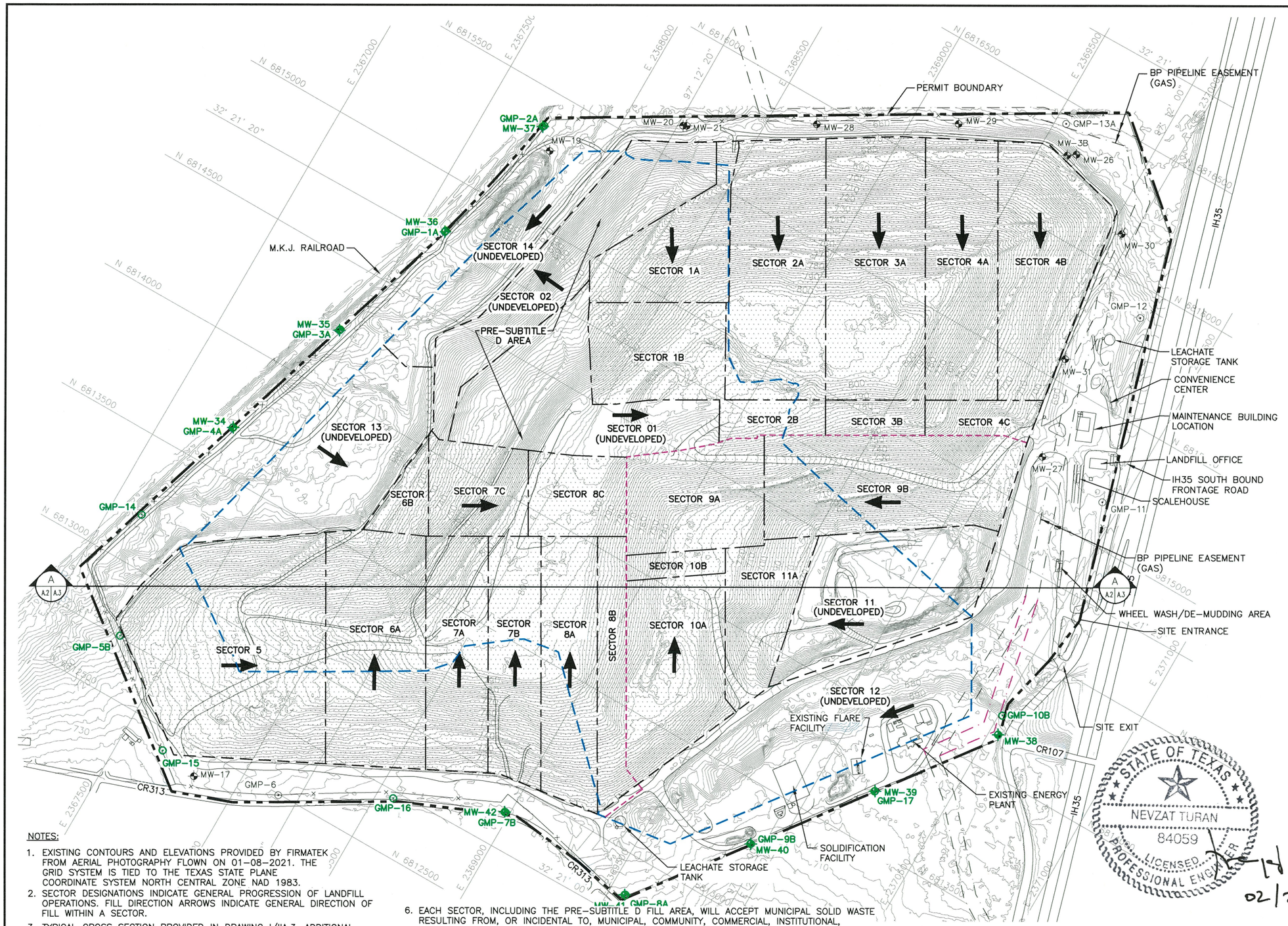
TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE I/II-A.1

COPYRIGHT © 2022 WEAVER CONSULTANTS GROUP. ALL RIGHTS RESERVED.

O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.1-EXISTING SITE PLAN.dwg, rarrington, 1:2



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT (SEE NOTE 8)
- SECTOR BOUNDARY
- EXISTING SUBTITLE D COMPOSITE LINED AREA
- MW-7 — EXISTING GROUNDWATER MONITORING WELL
- GMP-12 — EXISTING LFG MONITORING PROBE
- FILL DIRECTION (SEE NOTE 2)

CELL SUMMARY			
CELL	MAX LENGTH (FT)	MAX WIDTH (FT)	AREA (ACRES)
SUBTITLE D AREA			
SECTOR 1A/1B	1039	550	9.60
SECTOR 2A/2B	1189	403	10.74
SECTOR 3A/3B	1200	400	11.02
SECTOR 4A/4B/4C	1190	768	16.43
SECTOR 5	930	840	14.59
SECTOR 6A/6B	1346	400	9.91
SECTOR 7A/7B/7C	1370	462	13.65
SECTOR 8A/8B/8C	1439	323	11.46
SECTOR 9A/9B	1550	434	14.17
SECTOR 10A/10B	923	406	7.53
SECTOR 11	1087	658	11.50
SECTOR 12	1635	414	12.36
SECTOR 13	1128	431	8.33
SECTOR 14	1190	198	4.43
PRE-SUBTITLE D AREA			
SECTOR 01	352	430	9.1
SECTOR 02	1402	215	6.7

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. SECTOR DESIGNATIONS INDICATE GENERAL PROGRESSION OF LANDFILL OPERATIONS. FILL DIRECTION ARROWS INDICATE GENERAL DIRECTION OF FILL WITHIN A SECTOR.
3. TYPICAL CROSS SECTION PROVIDED IN DRAWING I/IIA.3. ADDITIONAL SECTION INFORMATION PROVIDED IN APPENDIX IIIA-B – LANDFILL UNIT CROSS SECTIONS.
4. SEE DRAWINGS I/IIA.4 THROUGH I/IIA.7 FOR DETAILED SECTOR DEVELOPMENT PLANS.
5. WIDTH OF THE BUFFER ZONE BETWEEN THE LIMITS OF WASTE AND THE PERMIT BOUNDARY VARIES; HOWEVER, THE BUFFER ZONE IS A MINIMUM OF 50 FEET FOR EXISTING FILL AREAS AND 125 FEET FOR THE NEWLY PERMITTED AIRSPACE. REFER TO APPENDIX I/IIC FOR MORE INFORMATION REGARDING BUFFER ZONES.
6. EACH SECTOR, INCLUDING THE PRE-SUBTITLE D FILL AREA, WILL ACCEPT MUNICIPAL SOLID WASTE RESULTING FROM, OR INCIDENTAL TO, MUNICIPAL, COMMUNITY, COMMERCIAL, INSTITUTIONAL, RECREATIONAL AND INDUSTRIAL ACTIVITIES, INCLUDING GARBAGE, PUTRESCIBLE WASTES, RUBBISH, ASHES, BRUSH, STREET CLEANINGS, DEAD ANIMALS, ABANDONED AUTOMOBILES, CONSTRUCTION-DEMOLITION WASTE, YARD WASTE, CLASS 1 NON-HAZARDOUS INDUSTRIAL SOLID WASTE DESIGNATED AS SUCH DUE TO ASBESTOS CONTENT, CLASS 2 NON-HAZARDOUS INDUSTRIAL SOLID WASTE, CLASS 3 NON-HAZARDOUS INDUSTRIAL SOLID WASTE, AND CERTAIN SPECIAL WASTES.
7. OTHER CLASS 1 NON-HAZARDOUS INDUSTRIAL SOLID WASTE (NOT CLASSIFIED AS SUCH DUE TO ASBESTOS CONTENT) WILL ONLY BE DISPOSED OF IN SECTORS 9A, 9B, 10A, 10B, 11, 11A AND 12.
8. THE PROPOSED EASEMENT SHOWN IS FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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REVIEWED BY: NT

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MAJOR PERMIT AMENDMENT SECTOR DEVELOPMENT SEQUENCE

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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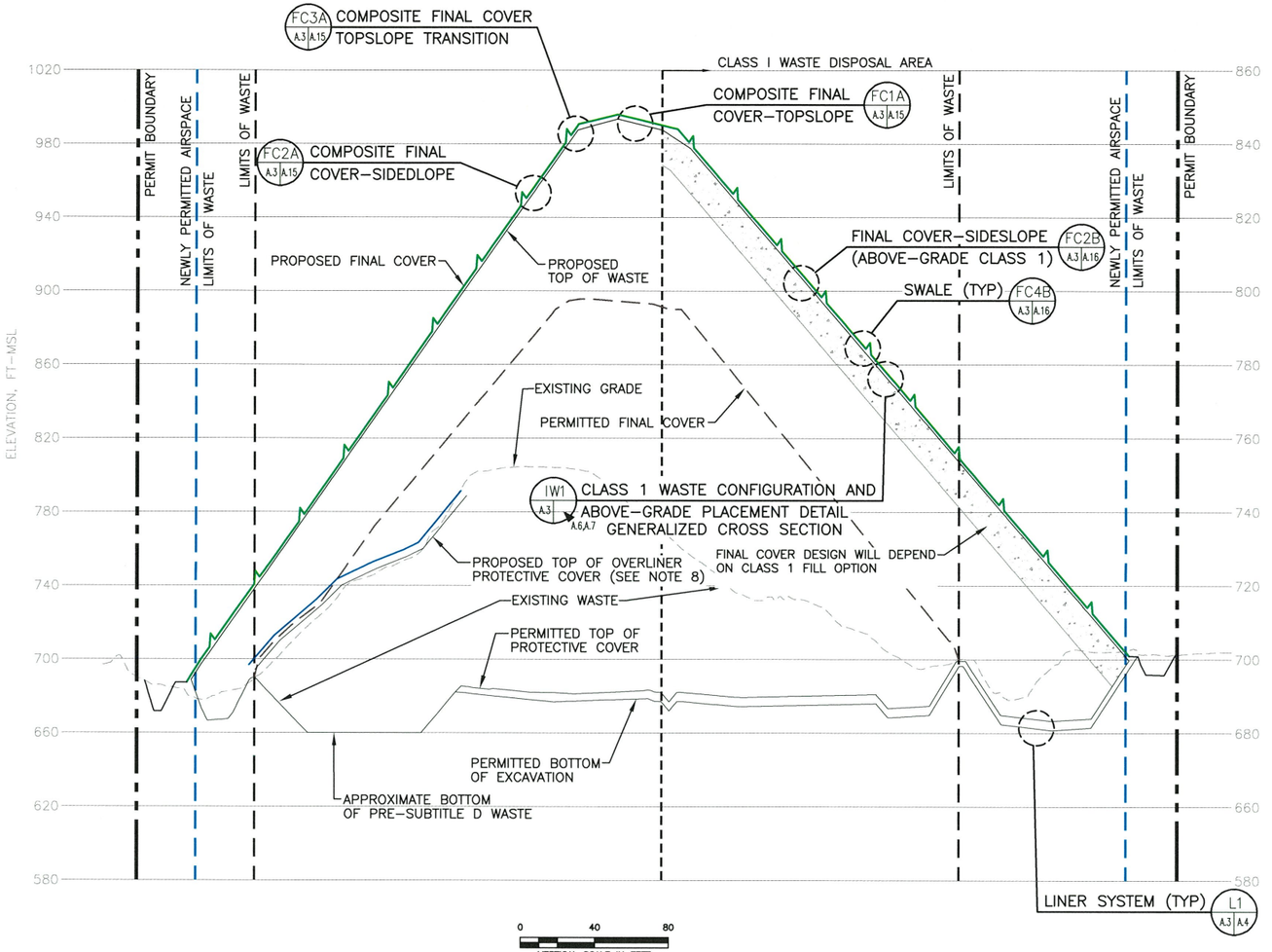
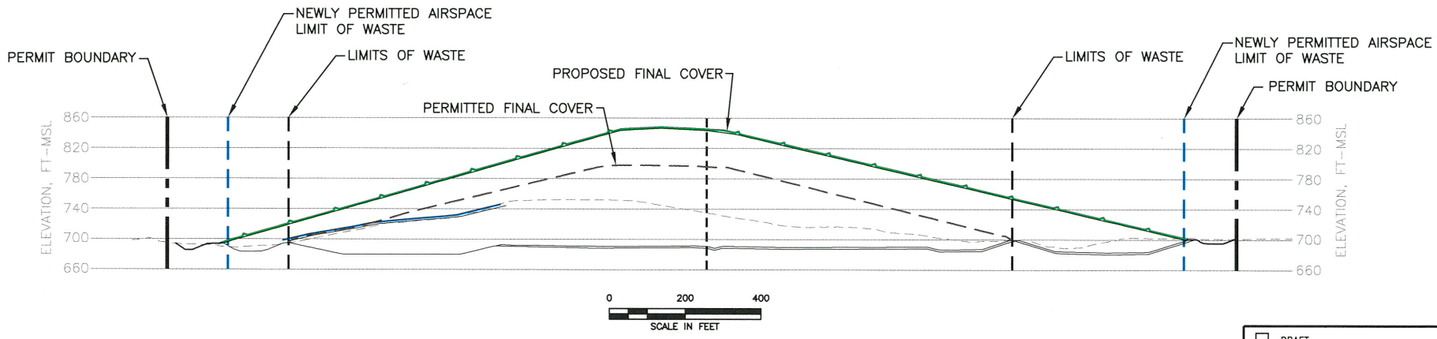
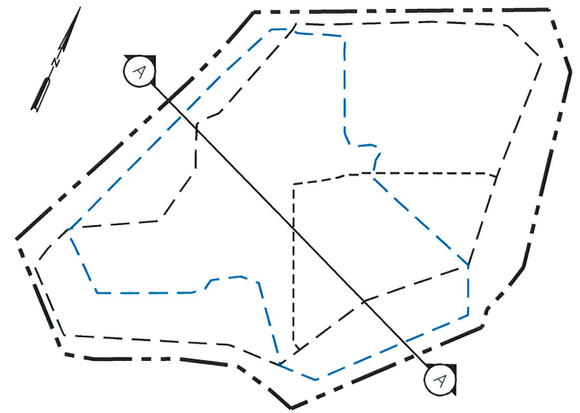
FIGURE I/II-A.2

O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.2-SECTOR DEVELOPMENT SEQUENCE.dwg, rarrington, 1:2







SECTION LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- LIMIT OF CLASS I WASTE DISPOSAL AREA
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- PERMITTED FINAL COVER
- L1 A.3 A.4 DETAIL CALLOUT (SEE NOTE 2)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01–08–2021.
2. REFER TO APPENDIX IIIA–A FOR LINER, OVERLINER, AND FINAL COVER SYSTEM DETAILS. DETAIL LOCATIONS REFER TO DRAWING NUMBERS IN APPENDIX IIIA–A THAT INCLUDE THE CALLED OUT DETAIL.
3. SEE APPENDIX IIIG FOR BORING DATA. BORINGS PROJECTED INTO THE LINE OF THE SECTION. SEE DRAWING B.1 FOR LOCATION.
4. AS SHOWN IN APPENDIX I/IIC, THE BUFFER ZONES VARY AROUND THE PERIMETER OF THE SITE, BUT IN NO CASE ARE THEY LESS THAN 50–FEET FOR EXISTING WASTE. THE BUFFER ZONE BETWEEN THE PERMIT BOUNDARY AND NEWLY PERMITTED (PERMIT NO. MSW–1417D) WASTE DISPOSAL AIRSPACE IS AT LEAST 125 FEET.
5. REFER TO APPENDIX IIII FOR DETAILS OF THE LANDFILL GAS MANAGEMENT PLAN.
6. DRAINAGE DESIGN INFORMATION IS PROVIDED IN APPENDIX IIIF–SURFACE WATER DRAINAGE PLAN.
7. MINIMUM EXCAVATION ELEVATION IS 648 FT–MSL. MAXIMUM TOP OF FINAL COVER ELEVATION IS 996 FT–MSL.
8. REFER TO APPENDIX IIIA–A FOR THE OVERLINER DESIGN THAT WILL BE INSTALLED OVER PRE–SUBTITLE D AREA.

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MAJOR PERMIT AMENDMENT
CROSS SECTION A

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II–A.3

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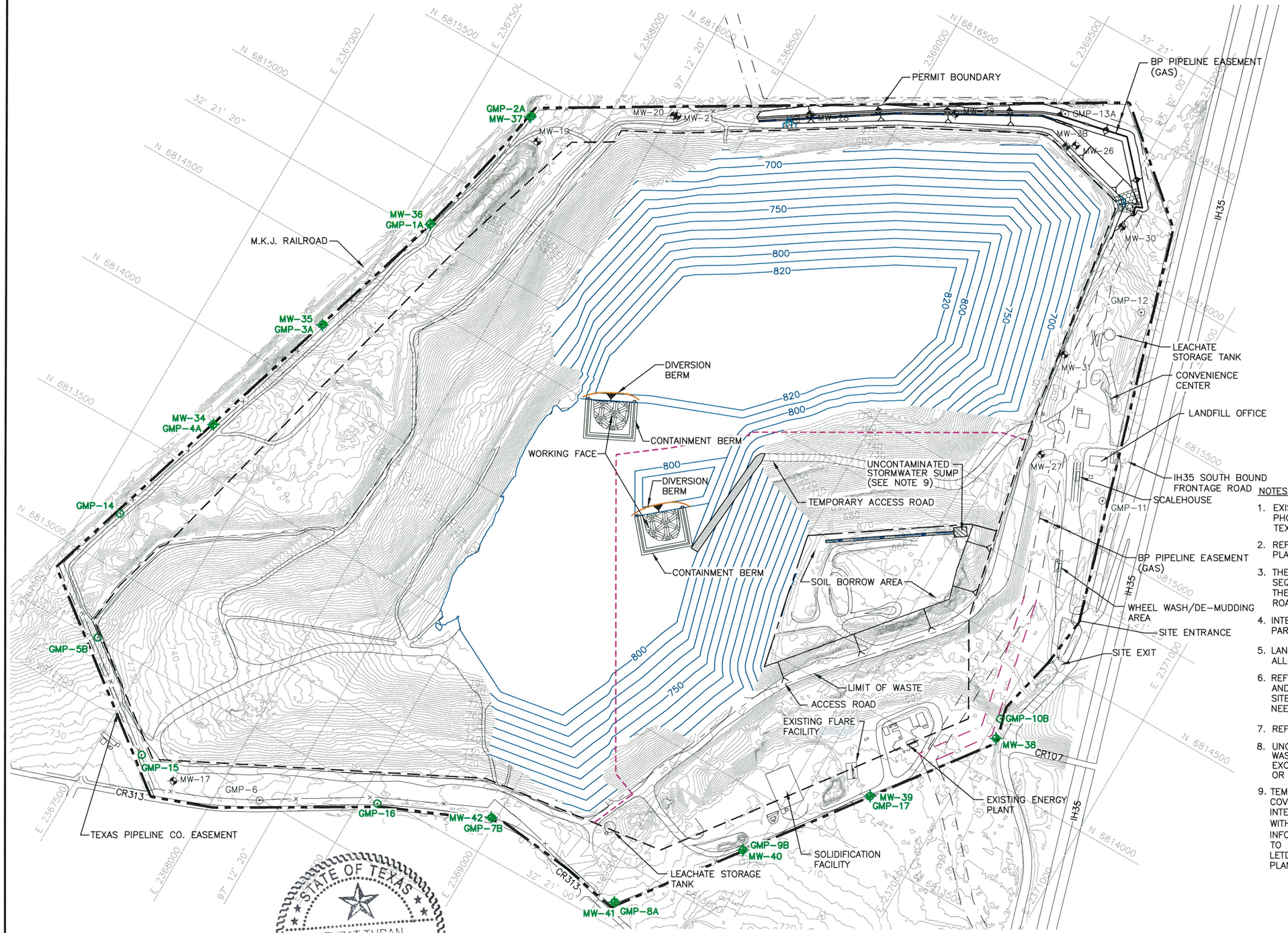
O:\0771\368\EXPANSION 2021\PARTS I–II\FIG A.3–SECTION A.dwg, rarrington, 1:2





LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- 800 — INTERMEDIATE CONTOUR
- GABIONS
- MW-7 — EXISTING GROUNDWATER MONITORING WELL
- GMP-12 — EXISTING LFG MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. REFER TO APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN-ON/RUN-OFF BERM DESIGN INFORMATION.
3. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. ACTUAL LANDFILL DEVELOPMENT MAY VARY. THE LOCATION OF THE ALL-WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
4. INTERMEDIATE COVER CONSISTS OF A 12-INCH THICK SOIL LAYER. REFER TO PART IV - SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
5. LANDFILL HAUL ROAD WILL BE SURFACED WITH CRUSHED STONE TO PROVIDE ALL-WEATHER ACCESS.
6. REFER TO APPENDIX IIIF-SURFACE WATER DRAINAGE PLAN FOR THE EROSION AND SEDIMENTATION CONTROL PLAN. DRAINAGE STRUCTURES ARE SHOWN AS THE SITE DEVELOPS. ADDITIONALLY BMPs WILL BE USED TO CONTROL EROSION AS NEEDED.
7. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
8. UNCONTAMINATED STORMWATER THAT HAS NOT COME INTO CONTACT WITH WASTE WILL BE COLLECTED IN SUMPS AND PERIODICALLY REMOVED FROM EXCAVATED AREAS BY PUMPING TO PERIMETER DRAINAGE CHANNELS OR USED IN SITE OPERATIONS (E.G., DUST CONTROL, COMPACTING, ETC.).
9. TEMPORARY CHUTES AND SWALES WILL BE PLACED OVER THE INTERMEDIATE COVER AREA TO MINIMIZE EROSION AND HELP ESTABLISH VEGETATION FOR INTERMEDIATE COVER AREAS THAT WILL NOT RECEIVE WASTE OR FINAL COVER WITHIN 180 DAYS AFTER PLACEMENT (REFER TO APPENDIX IIIF-F FOR MORE INFORMATION). MULCH, HYDROSEEDING OR SIMILAR METHODS WILL BE USED TO ESTABLISH VEGETATION OVER THE INTERMEDIATE COVER AREAS. SWALE AND LETDOWN SPACING WILL MEET THE REQUIREMENTS OF THE EROSION CONTROL PLAN INCLUDED IN APPENDIX IIIF-F.

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MAJOR PERMIT AMENDMENT
SECTOR DEVELOPMENT PLAN I

TURKEY CREEK LANDFILL
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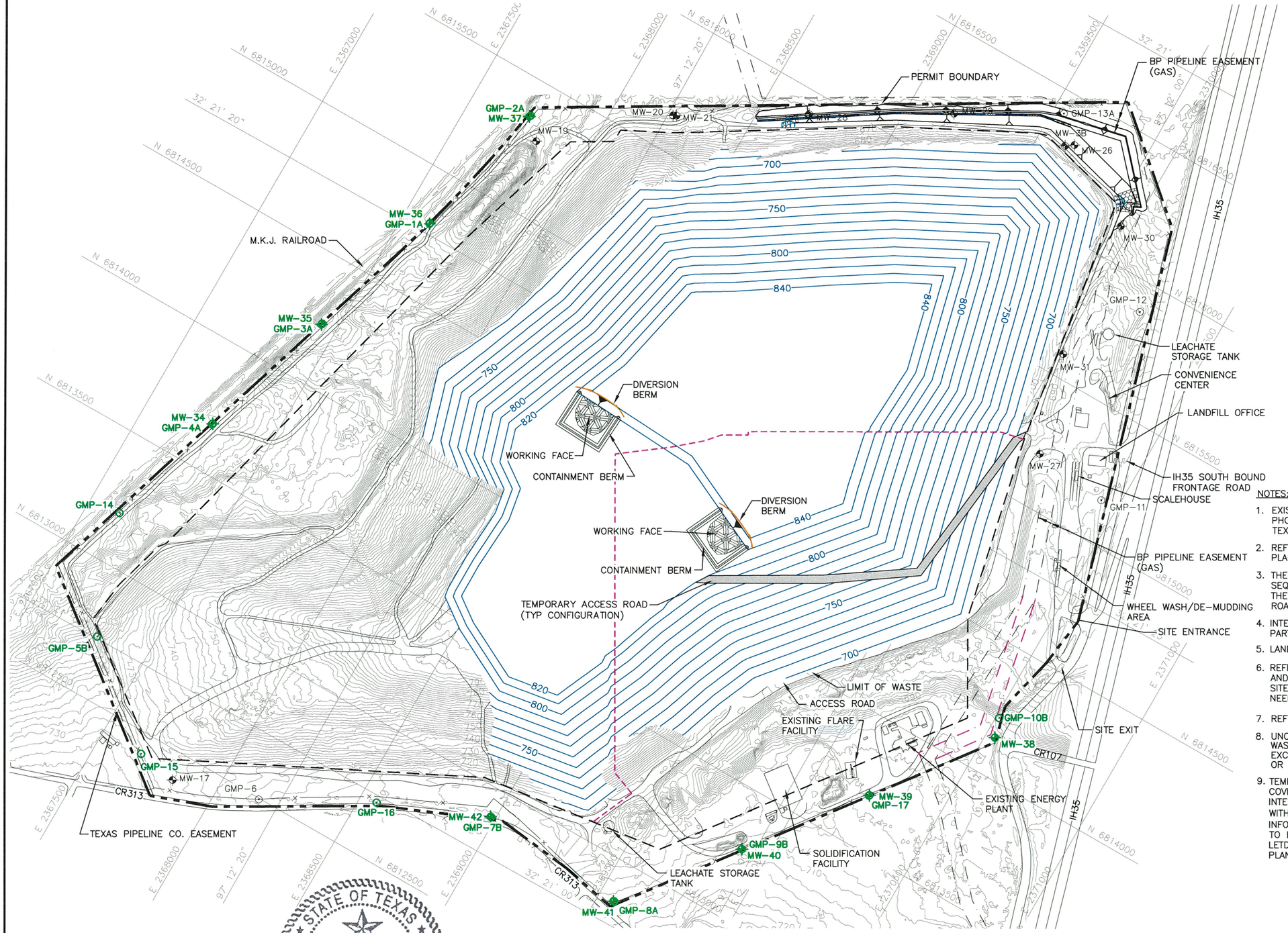
FIGURE I/II-A.4

O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.4-SECTOR DEVELOPMENT PLAN I.dwg, rarrington, 1:2



0 200 400
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- 32° 21' 20" GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- 800 INTERMEDIATE CONTOUR
- DRAINAGE CHANNEL
- GABIONS
- MW-7 EXISTING GROUNDWATER MONITORING WELL
- GMP-12 EXISTING LFG MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. REFER TO APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN-ON/RUN-OFF BERM DESIGN INFORMATION.
3. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. ACTUAL LANDFILL DEVELOPMENT MAY VARY. THE LOCATION OF THE ALL-WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
4. INTERMEDIATE COVER CONSISTS OF A 12-INCH THICK SOIL LAYER. REFER TO PART IV - SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
5. LANDFILL HAUL ROAD WILL BE SURFACED TO PROVIDE ALL-WEATHER ACCESS.
6. REFER TO APPENDIX IIIF-SURFACE WATER DRAINAGE PLAN FOR THE EROSION AND SEDIMENTATION CONTROL PLAN. DRAINAGE STRUCTURES ARE SHOWN AS THE SITE DEVELOPS. ADDITIONALLY BMPs WILL BE USED TO CONTROL EROSION AS NEEDED.
7. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
8. UNCONTAMINATED STORMWATER THAT HAS NOT COME INTO CONTACT WITH WASTE WILL BE COLLECTED IN SUMPS AND PERIODICALLY REMOVED FROM EXCAVATED AREAS BY PUMPING TO PERIMETER DRAINAGE CHANNELS OR USED IN SITE OPERATIONS (E.G., DUST CONTROL, COMPACTING, ETC.).
9. TEMPORARY CHUTES AND SWALES WILL BE PLACED OVER THE INTERMEDIATE COVER AREA TO MINIMIZE EROSION AND HELP ESTABLISH VEGETATION FOR INTERMEDIATE COVER AREAS THAT WILL NOT RECEIVE WASTE OR FINAL COVER WITHIN 180 DAYS AFTER PLACEMENT (REFER TO APPENDIX IIIF-F FOR MORE INFORMATION). MULCH, HYDROSEEDING OR SIMILAR METHODS WILL BE USED TO ESTABLISH VEGETATION OVER THE INTERMEDIATE COVER AREAS. SWALE AND LETDOWN SPACING WILL MEET THE REQUIREMENTS OF THE EROSION CONTROL PLAN INCLUDED IN APPENDIX IIIF-F.

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MAJOR PERMIT AMENDMENT SECTOR DEVELOPMENT PLAN II

TURKEY CREEK LANDFILL
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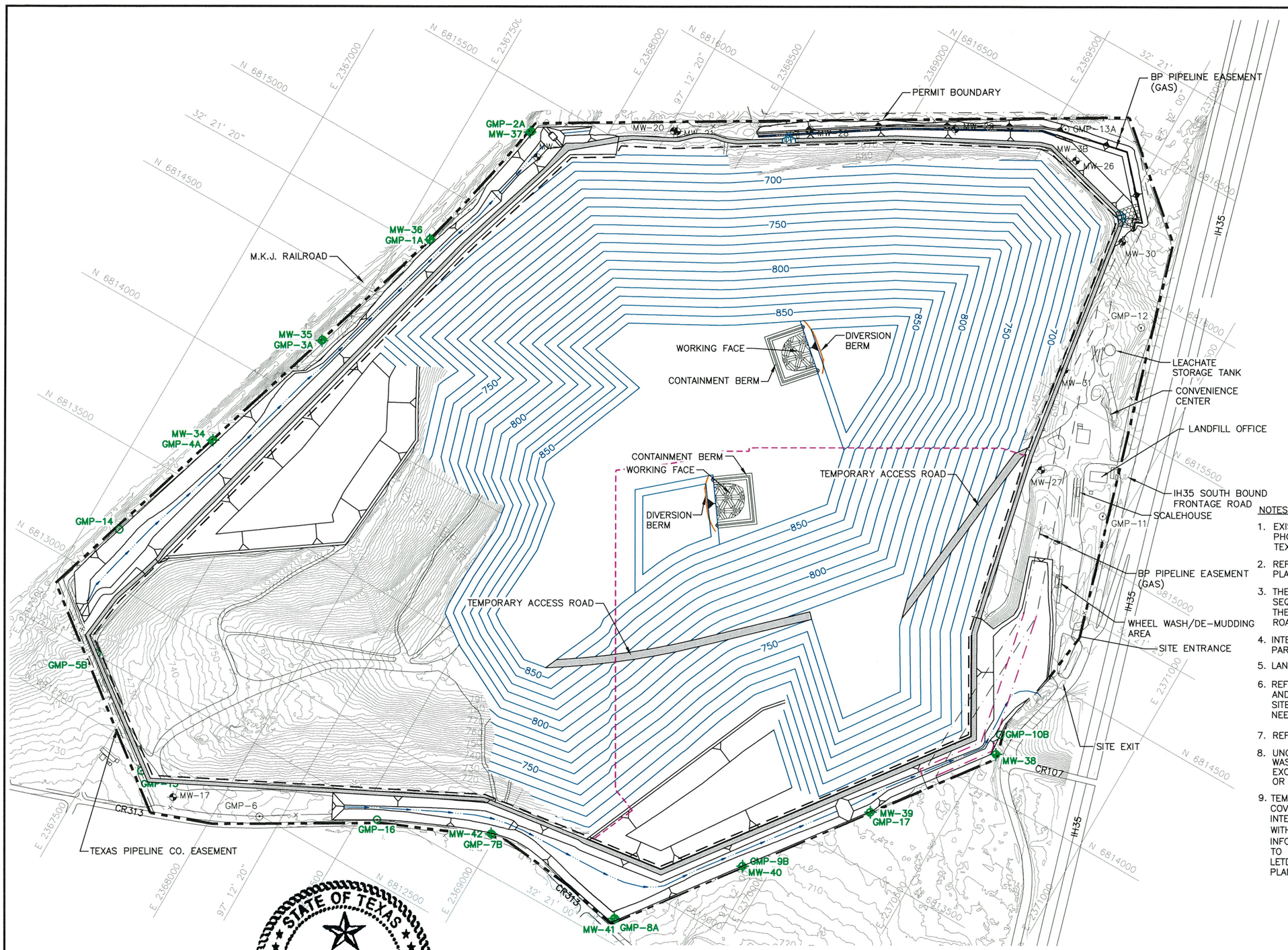
FIGURE I/II-A.5

O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.5-SECTOR DEVELOPMENT PLAN II.dwg, rarrington, 1:2



0 200 400
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- 32° 21' 20" GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- 800 INTERMEDIATE CONTOUR
- DRAINAGE CHANNEL
- GABIONS
- MW-7 EXISTING GROUNDWATER MONITORING WELL
- GMP-12 EXISTING LFG MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. REFER TO APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN-ON/RUN-OFF BERM DESIGN INFORMATION.
3. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. ACTUAL LANDFILL DEVELOPMENT MAY VARY. THE LOCATION OF THE ALL-WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
4. INTERMEDIATE COVER CONSISTS OF A 12-INCH THICK SOIL LAYER. REFER TO PART IV - SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
5. LANDFILL HAUL ROAD WILL BE SURFACED TO PROVIDE ALL-WEATHER ACCESS.
6. REFER TO APPENDIX IIIF-SURFACE WATER DRAINAGE PLAN FOR THE EROSION AND SEDIMENTATION CONTROL PLAN. DRAINAGE STRUCTURES ARE SHOWN AS THE SITE DEVELOPS. ADDITIONALLY BMPs WILL BE USED TO CONTROL EROSION AS NEEDED.
7. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
8. UNCONTAMINATED STORMWATER THAT HAS NOT COME INTO CONTACT WITH WASTE WILL BE COLLECTED IN SUMPS AND PERIODICALLY REMOVED FROM EXCAVATED AREAS BY PUMPING TO PERIMETER DRAINAGE CHANNELS OR USED IN SITE OPERATIONS (E.G., DUST CONTROL, COMPACTING, ETC.).
9. TEMPORARY CHUTES AND SWALES WILL BE PLACED OVER THE INTERMEDIATE COVER AREA TO MINIMIZE EROSION AND HELP ESTABLISH VEGETATION FOR INTERMEDIATE COVER AREAS THAT WILL NOT RECEIVE WASTE OR FINAL COVER WITHIN 180 DAYS AFTER PLACEMENT (REFER TO APPENDIX IIIF-F FOR MORE INFORMATION). MULCH, HYDROSEEDING OR SIMILAR METHODS WILL BE USED TO ESTABLISH VEGETATION OVER THE INTERMEDIATE COVER AREAS. SWALE AND LETDOWN SPACING WILL MEET THE REQUIREMENTS OF THE EROSION CONTROL PLAN INCLUDED IN APPENDIX IIIF-F.

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MAJOR PERMIT AMENDMENT SECTOR DEVELOPMENT PLAN III

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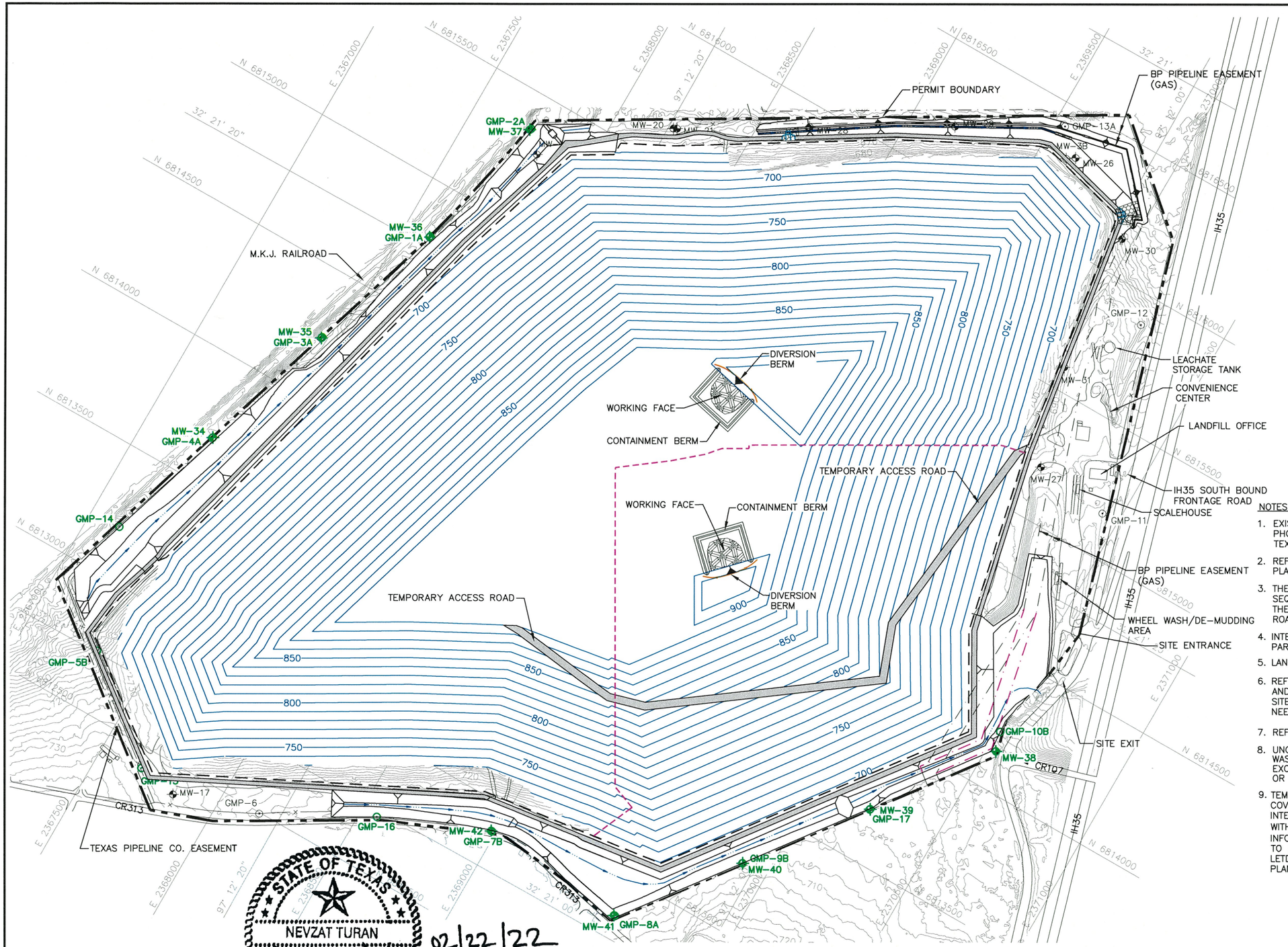
FIGURE I/II-A.6

O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.6-SECTOR DEVELOPMENT PLAN III.dwg, jwilson, 1:2



LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- 800 — INTERMEDIATE CONTOUR
- DRAINAGE CHANNEL
- GABIONS
- MW-7 — EXISTING GROUNDWATER MONITORING WELL
- GMP-12 — EXISTING LFG MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. REFER TO APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN FOR CONTAMINATED WATER RUN-ON/RUN-OFF BERM DESIGN INFORMATION.
3. THE SECTOR DEVELOPMENT SHOWN ON THIS DRAWING SHOWS THE GENERAL SEQUENCE OF FILLING OPERATIONS. ACTUAL LANDFILL DEVELOPMENT MAY VARY. THE LOCATION OF THE ALL-WEATHER ACCESS ROAD FROM THE LANDFILL HAUL ROAD TO THE ACTIVE AREA WILL BE DETERMINED DURING SITE OPERATIONS.
4. INTERMEDIATE COVER CONSISTS OF A 12-INCH THICK SOIL LAYER. REFER TO PART IV – SITE OPERATING PLAN FOR ADDITIONAL SOIL COVER REQUIREMENTS.
5. LANDFILL HAUL ROAD WILL BE SURFACED TO PROVIDE ALL-WEATHER ACCESS.
6. REFER TO APPENDIX IIIF-SURFACE WATER DRAINAGE PLAN FOR THE EROSION AND SEDIMENTATION CONTROL PLAN. DRAINAGE STRUCTURES ARE SHOWN AS THE SITE DEVELOPS. ADDITIONALLY BMPs WILL BE USED TO CONTROL EROSION AS NEEDED.
7. REFER TO APPENDIX IIII FOR LANDFILL GAS MANAGEMENT PLAN.
8. UNCONTAMINATED STORMWATER THAT HAS NOT COME INTO CONTACT WITH WASTE WILL BE COLLECTED IN SUMPS AND PERIODICALLY REMOVED FROM EXCAVATED AREAS BY PUMPING TO PERIMETER DRAINAGE CHANNELS OR USED IN SITE OPERATIONS (E.G., DUST CONTROL, COMPACTING, ETC.).
9. TEMPORARY CHUTES AND SWALES WILL BE PLACED OVER THE INTERMEDIATE COVER AREA TO MINIMIZE EROSION AND HELP ESTABLISH VEGETATION FOR INTERMEDIATE COVER AREAS THAT WILL NOT RECEIVE WASTE OR FINAL COVER WITHIN 180 DAYS AFTER PLACEMENT (REFER TO APPENDIX IIIF-F FOR MORE INFORMATION). MULCH, HYDROSEEDING OR SIMILAR METHODS WILL BE USED TO ESTABLISH VEGETATION OVER THE INTERMEDIATE COVER AREAS. SWALE AND LETDOWN SPACING WILL MEET THE REQUIREMENTS OF THE EROSION CONTROL PLAN INCLUDED IN APPENDIX IIIF-F.

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SECTOR DEVELOPMENT PLAN IV

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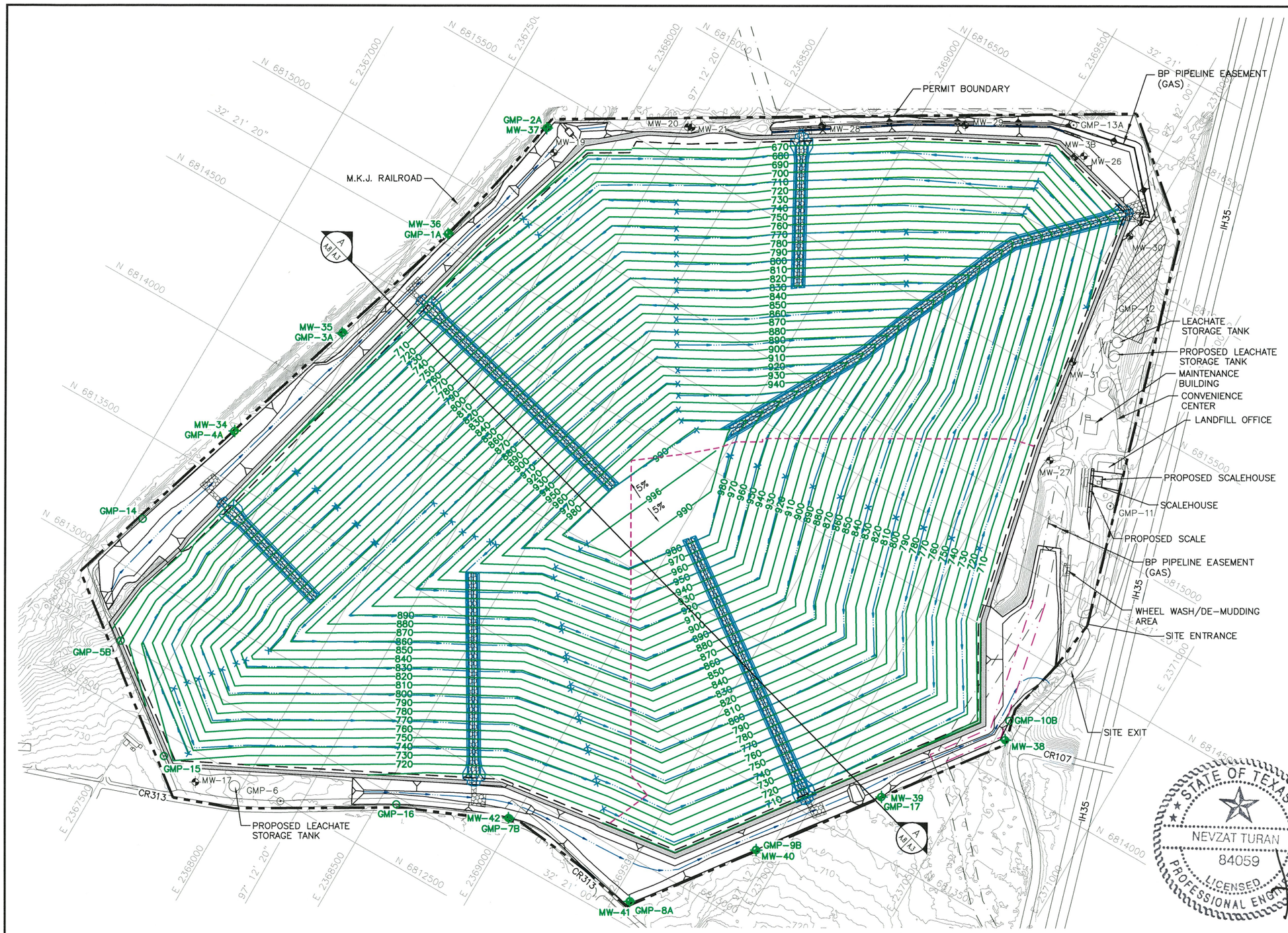
FIGURE I/II-A.7

O:\0771\368EXPANSION 2021\PARTS I-II\FIG A.7-SECTOR DEVELOPMENT PLAN IV.dwg, jwilson, 1:2



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- 800 — FINAL COVER CONTOUR
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- GABIONS
- MW-7 — EXISTING GROUNDWATER MONITORING WELL
- GMP-12 — EXISTING GAS MONITORING PROBE
- MW-7 — PROPOSED GROUNDWATER MONITORING WELL
- GMP-17 — PROPOSED GAS MONITORING PROBE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. REFER TO APPENDIX IIIF-SURFACE WATER DRAINAGE PLAN FOR DRAINAGE DESIGN INFORMATION.
3. MAXIMUM FINAL COVER ELEVATION IS 996.0 FT-MSL. MAXIMUM TOP OF WASTE ELEVATION IS 992.5 FT-MSL.

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DESIGN BY: CAM
REVIEWED BY: NT

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MAJOR PERMIT AMENDMENT
LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
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FIGURE I/II-A.8

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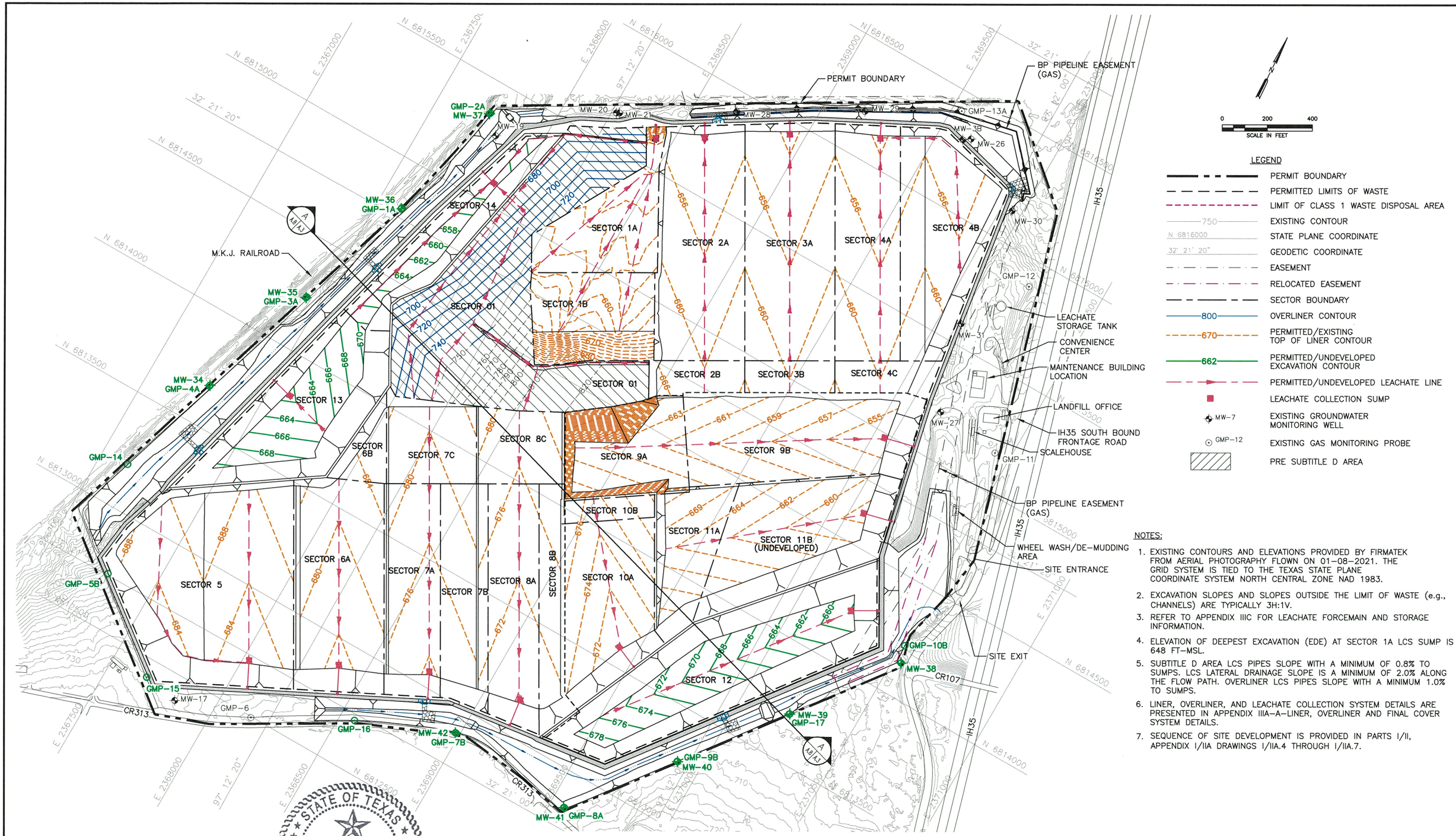
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.8-COMPLETION PLAN.dwg, rarrington, 1:2



0 200 400
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- 32° 21' 20" GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- SECTOR BOUNDARY
- 800 OVERLINER CONTOUR
- 670 PERMITTED/EXISTING TOP OF LINER CONTOUR
- 662 PERMITTED/UNDEVELOPED EXCAVATION CONTOUR
- PERMITTED/UNDEVELOPED LEACHATE LINE
- LEACHATE COLLECTION SUMP
- MW-7 EXISTING GROUNDWATER MONITORING WELL
- GMP-12 EXISTING GAS MONITORING PROBE
- PRE SUBTITLE D AREA

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. EXCAVATION SLOPES AND SLOPES OUTSIDE THE LIMIT OF WASTE (e.g., CHANNELS) ARE TYPICALLY 3H:1V.
3. REFER TO APPENDIX IIIC FOR LEACHATE FORCEMAIN AND STORAGE INFORMATION.
4. ELEVATION OF DEEPEST EXCAVATION (EDE) AT SECTOR 1A LCS SUMP IS 648 FT-MSL.
5. SUBTITLE D AREA LCS PIPES SLOPE WITH A MINIMUM OF 0.8% TO SUMPS. LCS LATERAL DRAINAGE SLOPE IS A MINIMUM OF 2.0% ALONG THE FLOW PATH. OVERLINER LCS PIPES SLOPE WITH A MINIMUM 1.0% TO SUMPS.
6. LINER, OVERLINER, AND LEACHATE COLLECTION SYSTEM DETAILS ARE PRESENTED IN APPENDIX IIIA-A-LINER, OVERLINER AND FINAL COVER SYSTEM DETAILS.
7. SEQUENCE OF SITE DEVELOPMENT IS PROVIDED IN PARTS I/II, APPENDIX I/IIA DRAWINGS I/IIA.4 THROUGH I/IIA.7.

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER
02/22/22

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CAD: A.9-EXCAVATION PLAN.DWG

DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

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MAJOR PERMIT AMENDMENT
EXCAVATION PLAN/OVERLINER PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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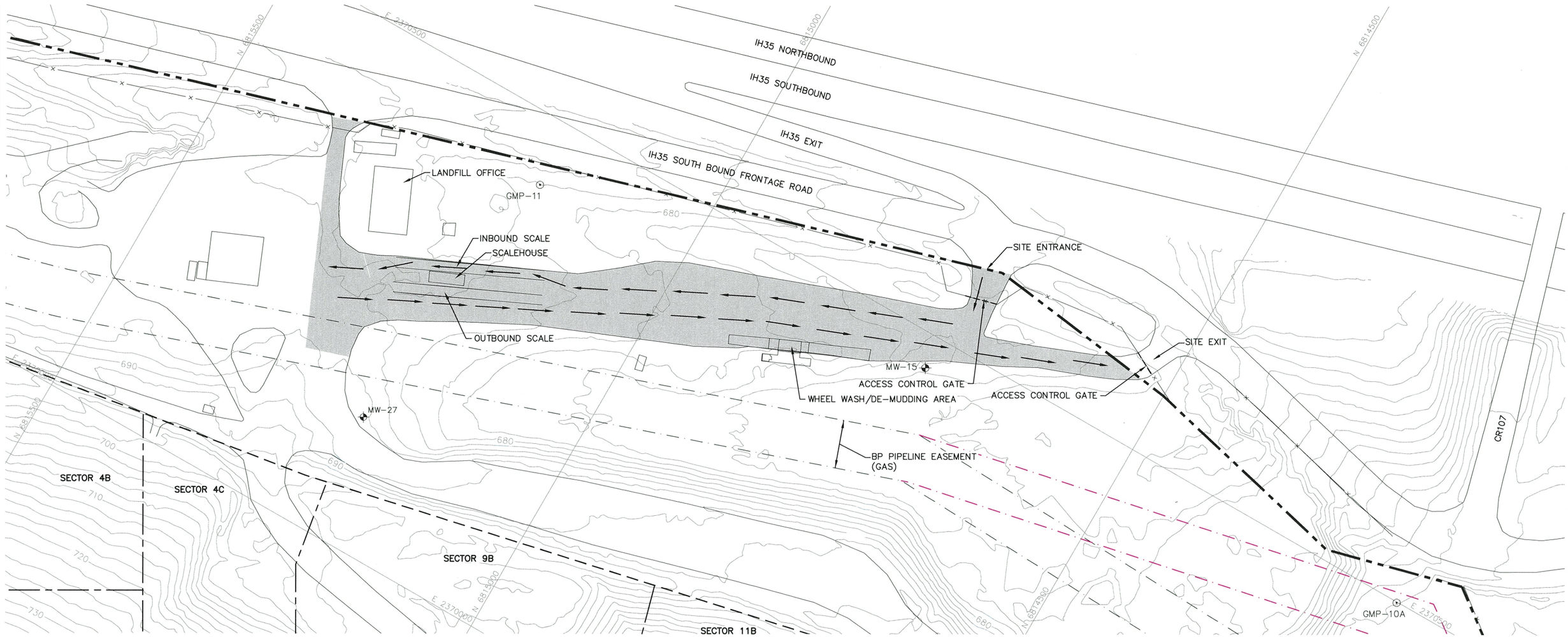
FIGURE I/II-A.9

0:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.9-EXCAVATION PLAN.dwg, rarrington, 1:2



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- 680 EXISTING CONTOUR
- N 6814500 STATE PLANE COORDINATE
- EASEMENT
- RELOCATED EASEMENT (SEE NOTE 3)
- MW-15 PERMITTED GROUNDWATER MONITORING WELL
- GMP-11 PERMITTED GAS MONITORING PROBE
- PAVED AREA (SEE NOTE 2)
- EXISTING FENCE
- VEHICLE TRAFFIC DIRECTION
- SECTOR BOUNDARY

0 50 100
SCALE IN FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. PAVED AREAS INSIDE THE PERMIT BOUNDARY HIGHLIGHTED. ALL WEATHER PAVING MAY BE PROVIDED USING ASPHALT, CONCRETE, GRAVEL OR A COMBINATION OF VARIOUS ALL WEATHER SURFACING.
3. THE PROPOSED EASEMENT SHOWN IS FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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TEXAS REGIONAL LANDFILL COMPANY, LP

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NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
EXISTING SITE ENTRANCE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-A.10

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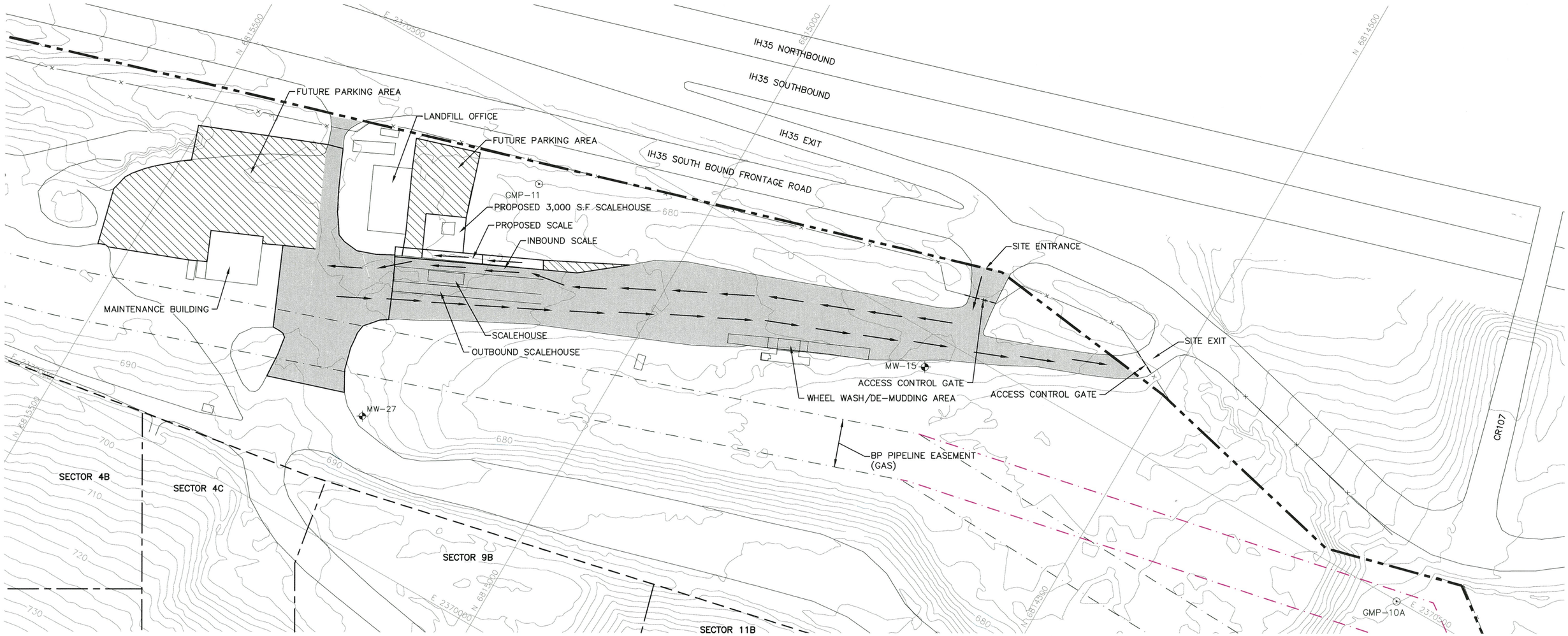
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.10-SITE ENTRANCE PLAN.dwg, rarrington, 1:2



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- 680 EXISTING CONTOUR
- N 6814500 STATE PLANE COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- MW-15 PERMITTED GROUNDWATER MONITORING WELL
- GMP-11 PERMITTED GAS MONITORING PROBE
- PAVED AREA (SEE NOTE 2)
- EXISTING FENCE
- VEHICLE TRAFFIC DIRECTION
- PROPOSED PAVED AREA

0 50 100
SCALE IN FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. PAVED AREAS INSIDE THE PERMIT BOUNDARY HIGHLIGHTED. ALL WEATHER PAVING MAY BE PROVIDED USING ASPHALT, CONCRETE, GRAVEL OR A COMBINATION OF VARIOUS ALL WEATHER SURFACING.

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NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
FUTURE SITE ENTRANCE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-A.10A

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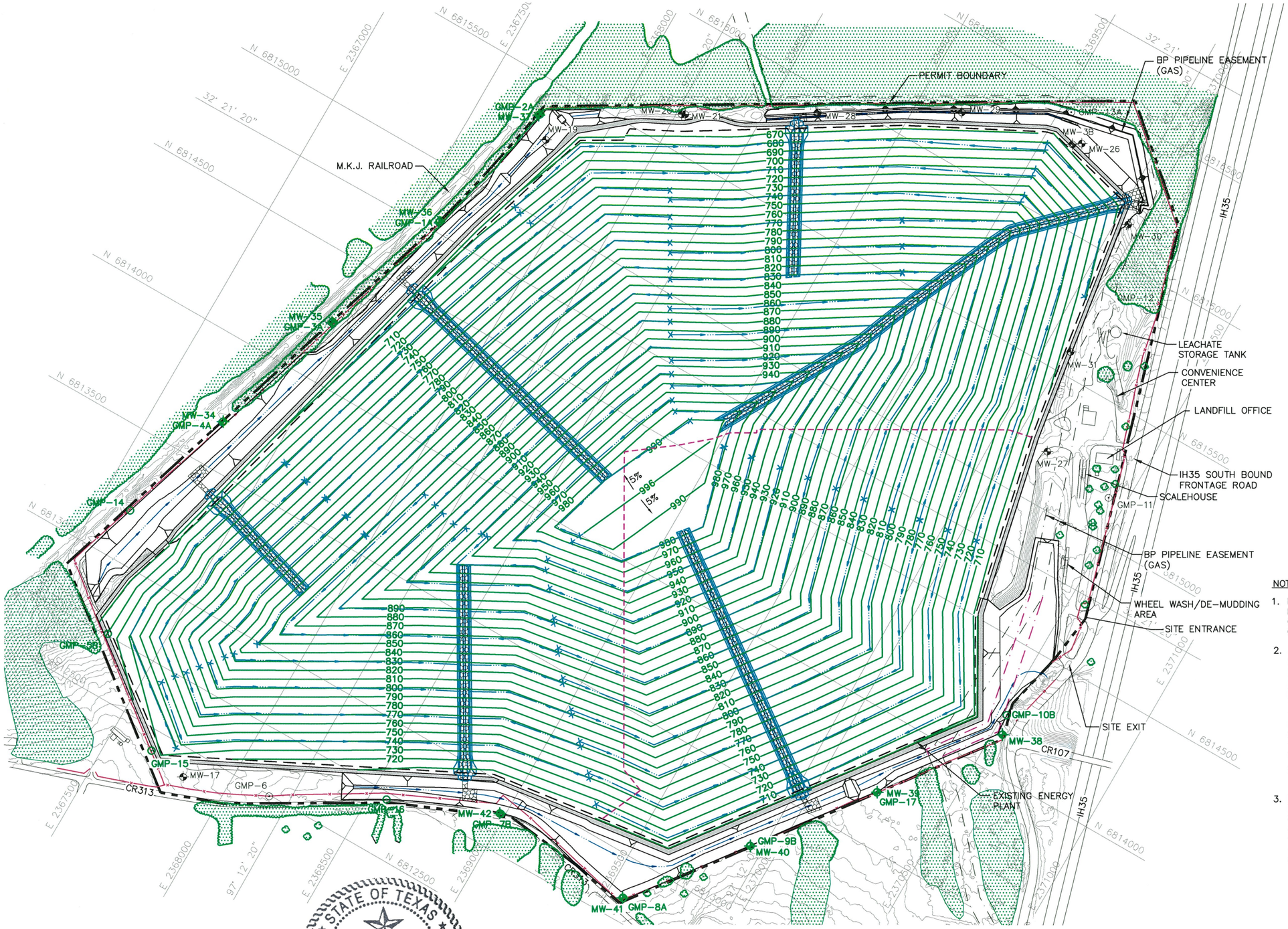
O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.10A-FUTURE ENTRANCE PLAN.dwg, rarrington, 1:2



LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- 800 — FINAL COVER CONTOUR
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- GABIONS
- MW-7 — EXISTING GROUNDWATER MONITORING WELL
- GMP-12 — EXISTING GAS MONITORING PROBE
- EXISTING FENCE
- EXISTING BUFFER ZONE WITH TREES AND SHRUBS (SEE NOTE 3)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. ACCESS TO THE SITE WILL BE CONTROLLED BY PERIMETER FENCING (MINIMUM 4-FEET HIGH, 3-STRAND BARBED WIRE FENCES), A GATED ENTRANCE, AND NATURAL BARRIERS (e.g TURKEY CREEK, DENSE FOLIAGE, AND VEGETATION). ADDITIONALLY, IN AREAS OF NATURAL BARRIERS, THE ACCESS CONTROL PLAN IS PROVIDED TO PREVENT THE ENTRY OF LIVESTOCK, TO PREVENT THE PUBLIC FROM EXPOSURE TO POTENTIAL HEALTH AND SAFETY HAZARDS, AND TO DISCOURAGE UNAUTHORIZED ENTRY OR UNCONTROLLED DISPOSAL OF SOLID WASTE OR HAZARDOUS MATERIALS. NO TRESPASSING SIGNS WILL BE ADDED TO DISCOURAGE UNAUTHORIZED ENTRY OR UNCONTROLLED DISPOSAL OF SOLID WASTE OR HAZARDOUS MATERIALS. SIGNS WILL BE PLACED APPROXIMATELY 300 FEET APART ALONG THE NORTHERN PORTION OF THE SITE.
3. FACILITY IS BOUNDED BY TWO PUBLIC ROADS WITH HIGH-CANOPY TREE LINES. THE EXISTING DENSE TREE LINES FUNCTION AS BOTH WINDBREAKS AND SITE SCREENING. AS SHOWN IN FIGURE I/II-A.2 SECTOR DEVELOPMENT SEQUENCE, THE LANDFILL IS SEQUENCED SUCH THAT THE ACTIVE FILL AREA WILL BE SCREENED BY THE EXISTING VEGETATION. THE FILL SEQUENCE WILL ALSO DEVELOP THE OUTERMOST SECTORS FIRST, WHICH WILL SCREEN SUBSEQUENT OPERATIONS.

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PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

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MAJOR PERMIT AMENDMENT
ACCESS CONTROL PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE I/II-A.11

O:\0771\368\EXPANSION 2021\PARTS I-II\FIG A.11ACCESS PLAN.dwg, rarrington, 1:2

APPENDIX I/IIB

DEMONSTRATION OF COORDINATION

- Coordination with Federal Aviation Administration
- Coordination with Texas Historical Commission
- Coordination with Texas Department of Transportation
- Coordination with Texas Parks and Wildlife Department
- Coordination with U.S. Army Corps of Engineers
- Coordination with U.S. Department of the Interior Fish and Wildlife Service
- Coordination with North Central Texas Council of Governments



COORDINATION WITH
FEDERAL AVIATION ADMINISTRATION

- FAA Determination of No Hazard to Air Navigation Letters will be included upon receipt.
- January 18, 2022 WCG Request for Review Letter regarding hazards to all navigation and hazards to air traffic due to birds.

[FAA APPROVAL LETTER TO BE INSERTED.]

Weaver Consultants Group

January 18, 2022
Project No. 0771-368-11-123

Mr. Joe Washington
Airports Division - Safety and Standards Branch, ASW-620
U.S. Department of Transportation
Federal Aviation Administration
10101 Hillwood Parkway
Fort Worth, Texas 76177

Re: Compliance with Airport Location Restriction
Proposed Turkey Creek Landfill Permit Amendment
Johnson County, Texas

Dear Mr. Washington:

The purpose of this letter is to demonstrate coordination with the Federal Aviation Administration (FAA), consistent with Texas Administrative Code (TAC) §330.61(i)(5) and §330.545. These regulations require that a permit applicant for a municipal solid waste facility permit amendment to coordinate with the FAA regarding the potential impact of the proposed amendment to existing airports or air traffic; specifically §330.545(d) requires the following.

> *"All landfill facilities within a six-mile radius of any small general service airport runway or within a five-mile radius of any large general public commercial airport shall be critically evaluated to determine if an incompatibility exists."*

Weaver Consultants Group, LLC is in the process of developing a major permit amendment application, on behalf of the Texas Regional Landfill Company, LP, to vertically expand an existing municipal solid waste landfill located south of the City of Alvarado in Johnson County. To assist you in your determination, please find attached the following information.

- Attachment A – FAA Airport Vicinity Map. As shown, there are no small general service airport runways located within the 6-mile radius of the site, or large general public commercial airports located within the 5-mile radius of the site. There are four airports designated as private use located within the 6-mile radius of the site (Luscombe Acres Airport, Block Ranch Airport, Drennan Airport, and Hodges Air Field).
- Attachment B – Project Summary and Site Location Maps.

- Attachment C – Proposed Landfill Completion Plan. This plan shows Points A through E, which have been uploaded to the FAA Web page so that an aeronautical study can be performed. Note that the peak elevation of the landfill only occurs at one point (Point C). However, Points A, B, D, and E are also set at the maximum landfill elevation to provide a conservative landfill configuration for the aeronautical study.

Please note that the Site Operating Plan includes requirements to maintain the working face of the landfill, where trash is exposed, to as small of an area as practical. Specific working face sizes are listed in the permit documents to minimize the potential of the site to attract birds. In addition, the site has a bird abatement program that incorporates the use of pyrotechnic devices or other bird control measures to minimize the bird population at the site.

Your assistance with this matter is sincerely appreciated. Please call if you have any questions or need additional information.

Sincerely,
Weaver Consultants Group, LLC

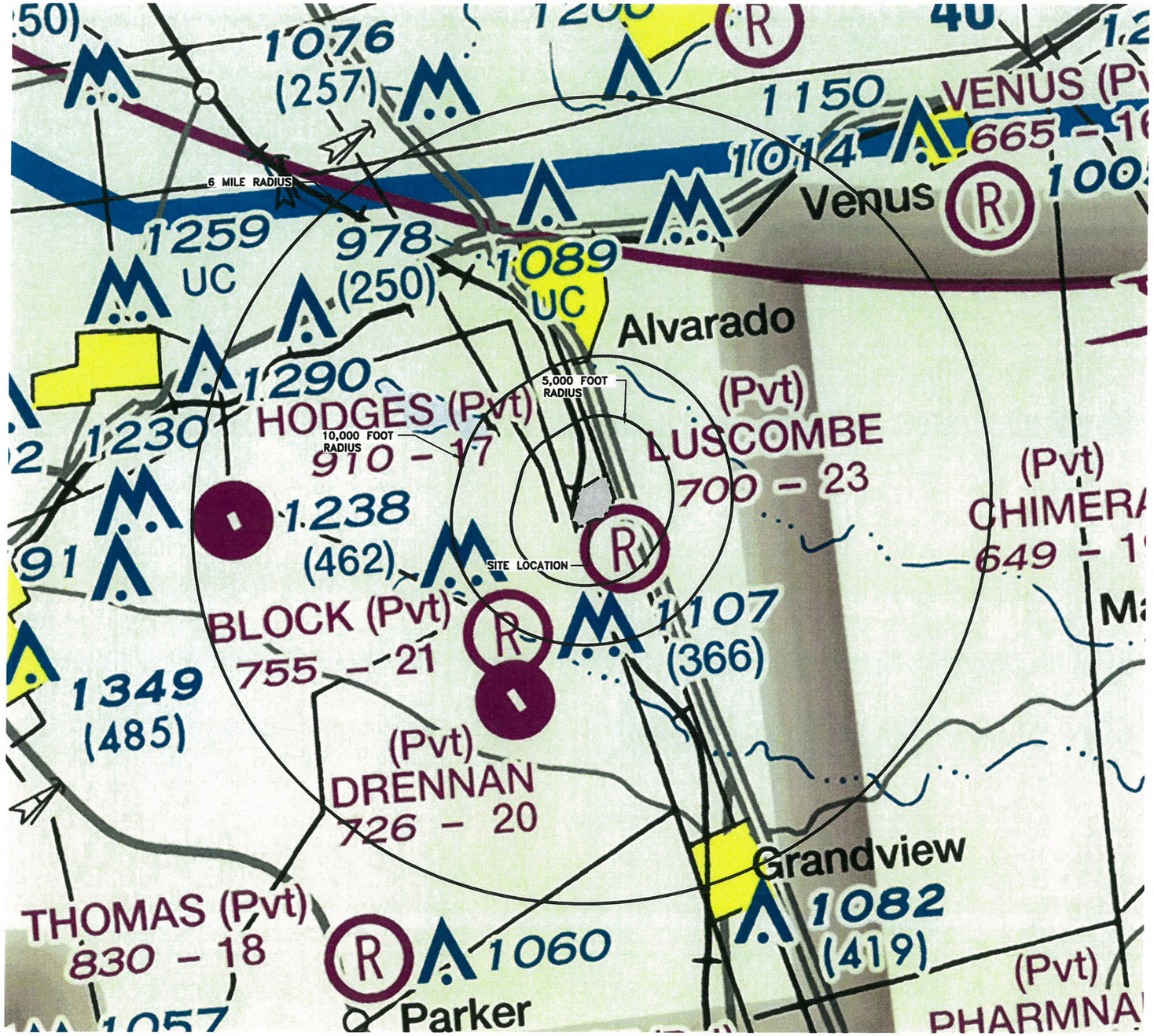
Charles R. Marsh, P.E.
Project Director

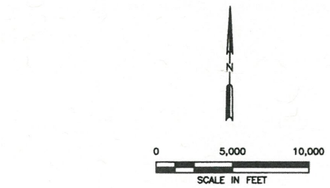
Attachments: Attachment A – FAA Airport Vicinity Map
Attachment B – Project Summary and Site Location Maps
Attachment C – Landfill Completion Plan

cc: Gary Bartels, Texas Regional Landfill Company, LP

ATTACHMENT A

FAA AIRPORT VICINITY MAP





AIRPORTS

Other than hard-surfaced runways

Seaplane Base

Hard-surfaced runways 1500 ft. or greater

Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, or VORTAC location.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification. Airports may be public or private.

ADDITIONAL AIRPORT INFORMATION

(R) Private "(Pvt)" - Non-public use having emergency or landmark value.

Military - Other than hard-surfaced. All military airports are identified by abbreviations AFB, NAS, AAF, etc. For complete airport information consult DOD FLIP.

(H) Heliport Selected

(U) Unverified

Abandoned - paved having landmark value, 3000 ft. or greater

(F) Ultralight Flight Park Selected

Services-fuel available and field tended during normal working hours depicted by use of ticks around basic airport symbol. (Normal working hours are Mon thru Fri 10:00 A.M. to 4:00 P.M. local time.) Consult A/FD for service availability at airports with hard-surfaced runways 1500 ft. or greater.

☆ Rotating airport beacon in operation Sunset to Sunrise.

TOPOGRAPHIC INFORMATION

Roads

95 40 Road Markers

Railroad

Bridges And Viaducts

Power Transmission Lines

Aerial Cable

Landmark Feature - stadium, factory, school, golf course, etc.

Outdoor Theatre

Lookout Tower P-17 (Site Number) 618 (Elevation Base of Tower)

CG Coast Guard Station

Race Track

Tank - water, oil or gas

Oil Well • Water Well

Mines And Quarries

Mountain Pass

11823 (Elevation of Pass)

(Pass symbol does not indicate a recommende route or direction of flight and pass elevation d not indicate a recommended clearance altitude Hazardous flight conditions may exist within ar near mountain passes.)

RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES

122.1R 122.6 123.6
OAKDALE (T)
362 *116.8 OAK

Underline indicates no voice on this frequency.

★ - Operates less than continuous or On-Request.

(T) - TWEB (H) - HIWAS

(A) - ASOS/ AWOS

122.1R
MIAMI

FSS providing voice communication

122.1R
CHICAGO CHI

Heavy line box indicates Flight Service Station (FSS). Frequencies 121.5, 122.2, 243.0, and 255.4 (Canada - 121.5, 126.7 and 243.0) are normally available at all FSSs and are not shown above boxes. All other frequencies are shown. For Local Airport Advisory use FSS frequency 123.6.

R - Receive only

Frequencies above thin line box are remoted to NAVAID site. Other frequencies at FSS providing voice communication may be available as determined by altitude and terrain. Consult Airport/Facility Directory for complete information.

OBSTRUCTIONS

1000 ft. and higher AGL

below 1000 ft. AGL

Group Obstruction

Obstruction with high-intensity lights May operate part-time

2049 (1149) UC

Elevation of the top above mean sea level

Height above ground

Under construction or reported: position and elevation unverified

NOTICE: Guy wires may extend outward from structures.

NOTES:

1. THIS MAP REPRODUCED FROM THE FAA DALLAS–FORT WORTH SECTIONAL AERONAUTICAL CHARTS DATED MARCH 1, 2018.
2. THERE ARE NO PUBLIC AIRPORTS WITHIN A 10,000 FOOT RADIUS OF THE SITE.
3. THERE ARE FOUR SMALL PRIVATELY OWNED, PRIVATE USE AIRPORTS WITHIN A 6–MILE RADIUS OF THE SITE.

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O:\0771\368\EXPANSION 2021\AGENCY COORDINATION\FAA\FIG 1-AREA AIRPORTS.dwg, jwilson, 1:2

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CAD: 1-AREA AIRPORTS.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

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PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
AREA AIRPORTS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1

ATTACHMENT B

PROJECT SUMMARY AND SITE LOCATION MAPS

Project Summary
Turkey Creek Landfill Expansion
Johnson County, Texas

Introduction

Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain authorization for an expansion of the existing Turkey Creek Landfill. This landfill expansion project will provide long-term disposal capacity for municipal solid waste that is generated in the area. The permit application will be submitted to the Texas Commission on Environmental Quality (TCEQ). The application will undergo a detailed review by the TCEQ before the permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed landfill expansion. The following subsections detail information regarding the owner and operator of the site, general site information, and a summary of the proposed site design.

Owner/Operator Information

The Turkey Creek Landfill is owned and operated by Texas Regional Landfill Company, LP (previously IESI TX Landfill, LP), a subsidiary of Waste Connections, Inc. Waste Connections, Inc. is one of the leading providers of solid waste services in the nation and provides services to residential, municipal and commercial customers across the country.

Site Information

The following drawings are attached to this summary.

- Figure 1 – Site Location Map. This drawing shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This drawing shows the existing permitted landfill permit boundary and the limits of disposal area on a USGS map.
- Figure 3 – Aerial Photograph. This figure details the existing permitted landfill permit boundary and limits of waste disposal area on an aerial photograph.
- Figure 4 – Site Plan. This plan highlights the existing permitted landfill permit boundary and the limits of disposal area on a detailed topographic map.
- Figure 5 – Existing and Proposed Landfill Completion Plan. This Plan provides a comparison between the currently permitted landfill and the proposed changes to the landfill completion plan.

Site History

The Turkey Creek Landfill is an existing 219.6-acre municipal solid waste (MSW) landfill (TCEQ Permit No. MSW-1417C) located approximately 2.5 miles south of the City of Alvarado in Johnson County, Texas. The site was originally permitted as a 91-acre Type I MSW disposal facility in 1983 (Permit No. MSW-1417). A permit amendment (MSW-1417A) was issued in 1988 which did not add acreage, but made more efficient use of the permitted area. The permit was amended in 1991 (Permit No. MSW-1417B). This amendment increased the permit boundary to its currently permitted acreage (219.6 acres). The permit was amended again in 2020 (Permit No. MSW-1417C). This amendment increased the height from 834 feet mean sea level (ft-msl) to 946 ft-msl. The currently permitted waste disposal footprint is approximately 146.4 acres.

Design Summary

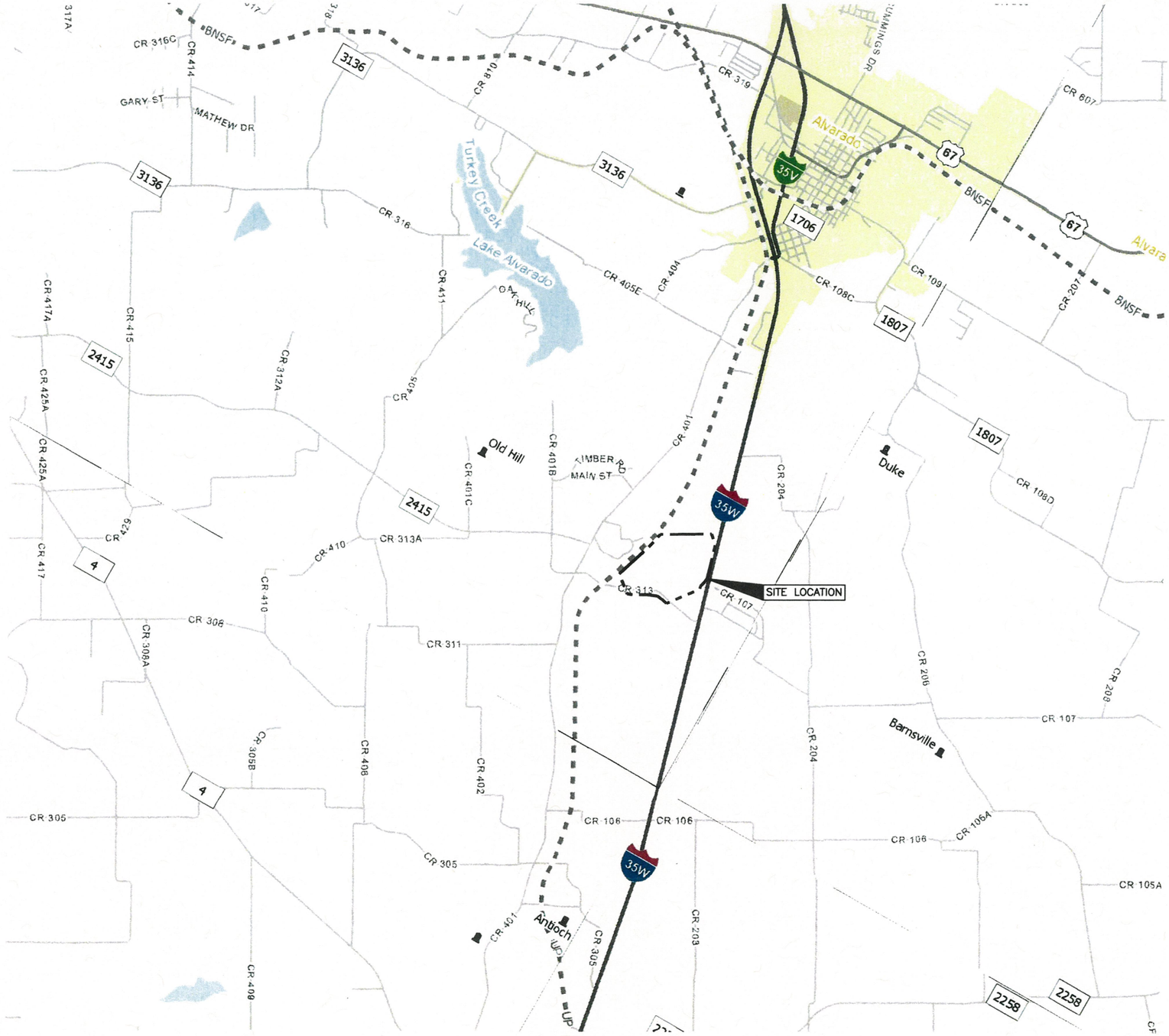
The following information presents a summary of the design and operations of the proposed Turkey Creek Landfill expansion.

- The Turkey Creek Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-1417C). The existing landfill currently serves residences and businesses in the communities of Johnson County and nearby counties.
- With this expansion, the existing 219.6-acre permit boundary footprint will not be expanded. The permitted limits of waste will be expanded from approximately 146.4 acres to approximately 172.0 acres. The current peak elevation of 946 feet mean sea level (msl) will be expanded vertically to 996 feet msl.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the Turkey Creek Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes as approved by TCEQ.
- Access to the site will be provided via the existing site access roads. Based on travel patterns of existing landfill traffic, vehicles bound for the landfill will generally access the site using I-35W and the I-35W frontage road. which is capable of handling the loads associated with landfill traffic.
- A liner and final cover system that meets all regulatory requirements will be used for the solid waste containment system. The design objective of the containment system (final cover, liner, and leachate management systems) is to isolate the solid waste and remove leachate (defined as liquid that has contacted solid waste) that may collect on the liner system. Collected leachate will be stored on-site then transferred to an authorized treatment facility, handled on-site in accordance with the liquid stabilization program, or recirculated to areas with composite liners for use as a compaction aid in the working face. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures,

liner and cover systems follow strict TCEQ-approved quality control procedures, which are performed by a qualified independent licensed professional engineer specialized in landfill construction quality assurance. Each of the containment system components must be thoroughly reviewed and approved by the TCEQ before solid waste is placed in the landfill.

- To control landfill gas (LFG) emissions and minimize the potential for subsurface migration a LFG collection and control system (GCCS) has been installed at the site. The collection system currently consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is conveyed to a nearby plant and converted to energy or conveyed to a LFG flare where it is combusted. The existing LFG system will continued to be expanded to collect LFG from the currently permitted but undeveloped waste fill footprint and the horizontal expansion areas. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control LFG.
- To verify that the highest level of environmental protection is provided, the following landfill monitoring systems are provided:
  - Groundwater Monitoring System. The purpose of the groundwater monitoring system is to verify the integrity of the containment system and verify that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining water samples from the monitor wells located on the perimeter of the landfill, which are screened in the upper most water table. The water samples are tested by an accredited third-party analytical laboratory.
  - LFG Detection System. The purpose of the LFG detection system is to verify that LFG does not migrate off-site. LFG detection probes have been installed along the current permit boundary perimeter.

  Each of these systems are sampled and tested periodically. The results are filed with the TCEQ and are public record.
- Site Operations. The site will be operated by personnel who have been trained and certified by the TCEQ. A detailed site operating plan will be included in the permit amendment application. The plan will detail the required equipment, personnel, and safety procedures required to operate the site in accordance with TCEQ regulations. The active landfill area will be covered at the end of each workday to prevent potential nuisance conditions such as odors and vectors. The Turkey Creek Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.



0 1/2 1
SCALE IN MILES

LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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DATE: 12/2021
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CAD: FIG 1-SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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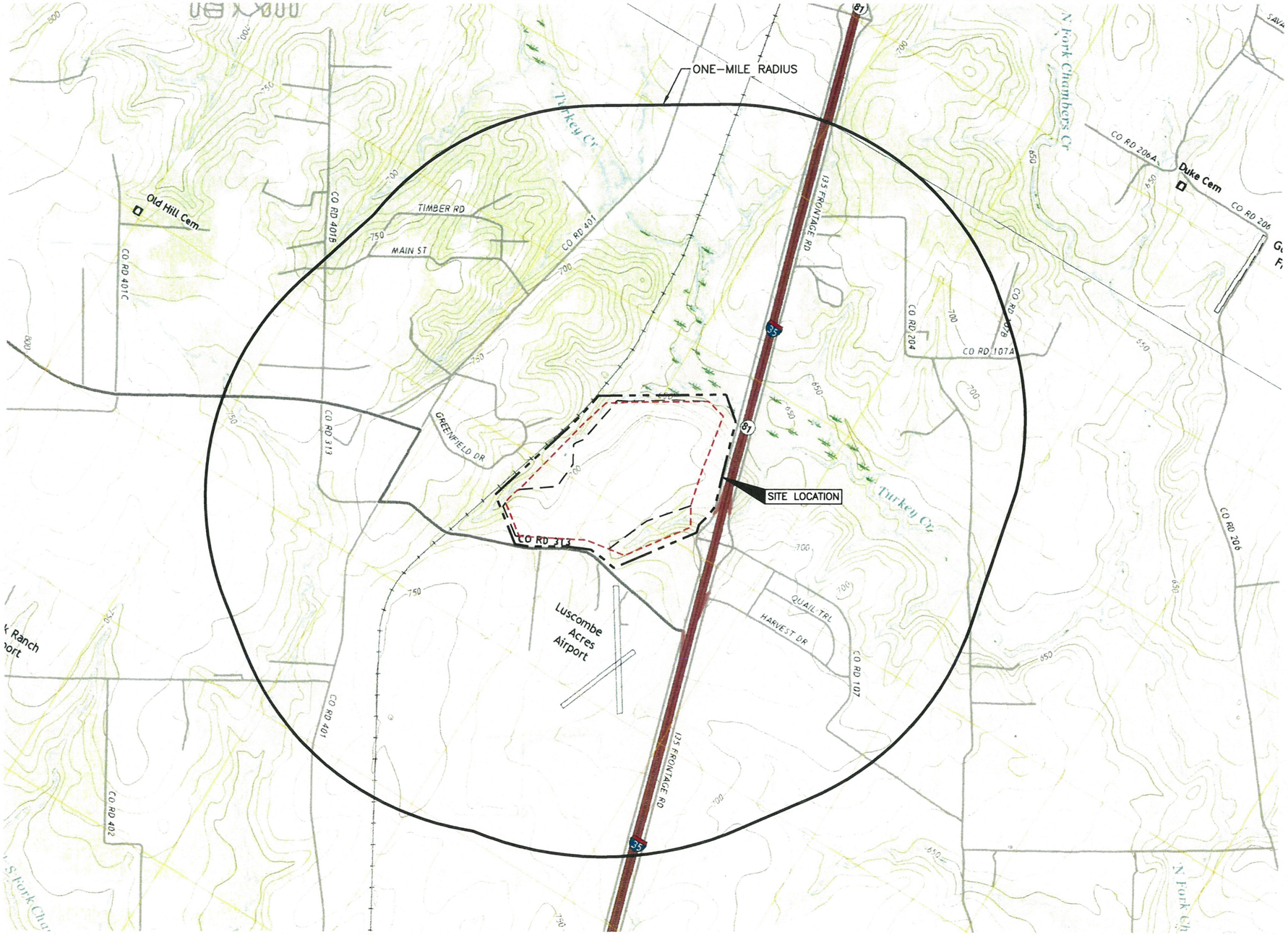
FIGURE 1

0:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 1-SITE LOCATION MAP.dwg, jpuhr, 1:2



0 1000 2000
SCALE IN FEET

LEGEND

- PROPERTY/PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway, Secondary Hwy, Ramp, Local Connector, Local Road, 4WD
Interstate Route, US Route, State Route

ALVARADO, TX
2019

GRANDVIEW, TX
2019

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads..... U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2000 - 2018
Contours.....National Elevation Dataset, 2003 - 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 1981

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads..... U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2002 - 2018
Contours.....National Elevation Dataset, 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 1981

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 2-GENERAL TOPO MAP.DWG
DRAWN BY: SRF
DESIGN BY: DEP
REVIEWED BY: CRM

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GENERAL TOPOGRAPHIC MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2

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O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 2-GENERAL TOPO MAP.dwg, jpubr, 1:2



N

0 200 400

SCALE IN FEET

LEGEND

PROPERTY/PERMIT BOUNDARY
PERMITTED LIMITS OF WASTE
PROPOSED LIMITS OF WASTE

NOTES:

1. AERIAL IMAGERY PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

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DATE: 12/2021
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CAD: FIG 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

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AERIAL PHOTOGRAPH

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 3

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 3-AERIAL PHOTOGRAPH.dwg, jwilson, 1:2

BP PIPELINE EASEMENT (GAS)

PERMIT BOUNDARY

M.K.J. RAILROAD

OVERLINER AREA

LEACHATE STORAGE TANK

LANDFILL OFFICE

I-35W FRONTAGE ROAD

SCALEHOUSE

SITE ACCESS TO I-35W

SITE ENTRANCE

SITE EXIT

COUNTY ROAD 107

EXISTING ENERGY PLANT

EXISTING SOLIDIFICATION FACILITY

LEACHATE STORAGE TANK

EXISTING FLARE FACILITY

ACCESS ROAD

LIMIT OF WASTE

SECTOR 1A
SECTOR 1B
SECTOR 2A
SECTOR 2B
SECTOR 3A
SECTOR 3B
SECTOR 4A
SECTOR 4B
SECTOR 4C
SECTOR 5
SECTOR 6A
SECTOR 6B
SECTOR 7A
SECTOR 7B
SECTOR 7C
SECTOR 8A
SECTOR 8B
SECTOR 8C
SECTOR 9A
SECTOR 9B
SECTOR 10
SECTOR 11A
SECTOR 11B (UNDEVELOPED)
SECTOR 12
SECTOR 13
SECTOR 14

MW-7, MW-9, MW-13, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-26, MW-27, MW-28, MW-29, MW-30, MW-31, MW-32, MW-33

GMP-1, GMP-2, GMP-3, GMP-4, GMP-5A, GMP-6, GMP-7A, GMP-8, GMP-9A, GMP-10A, GMP-11, GMP-12, GMP-13A

UV-1, UV-2, UV-3, UV-4, UV-5, UV-6, UV-7

0 200 400
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- SECTOR BOUNDARY
- MW-7 PERMITTED GROUNDWATER MONITORING WELL
- GMP-12 PERMITTED GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 4-SITE PLAN.dwg, jwilson, 1:2

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DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

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TEXAS REGIONAL LANDFILL COMPANY, LP

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NO.	DATE	DESCRIPTION

SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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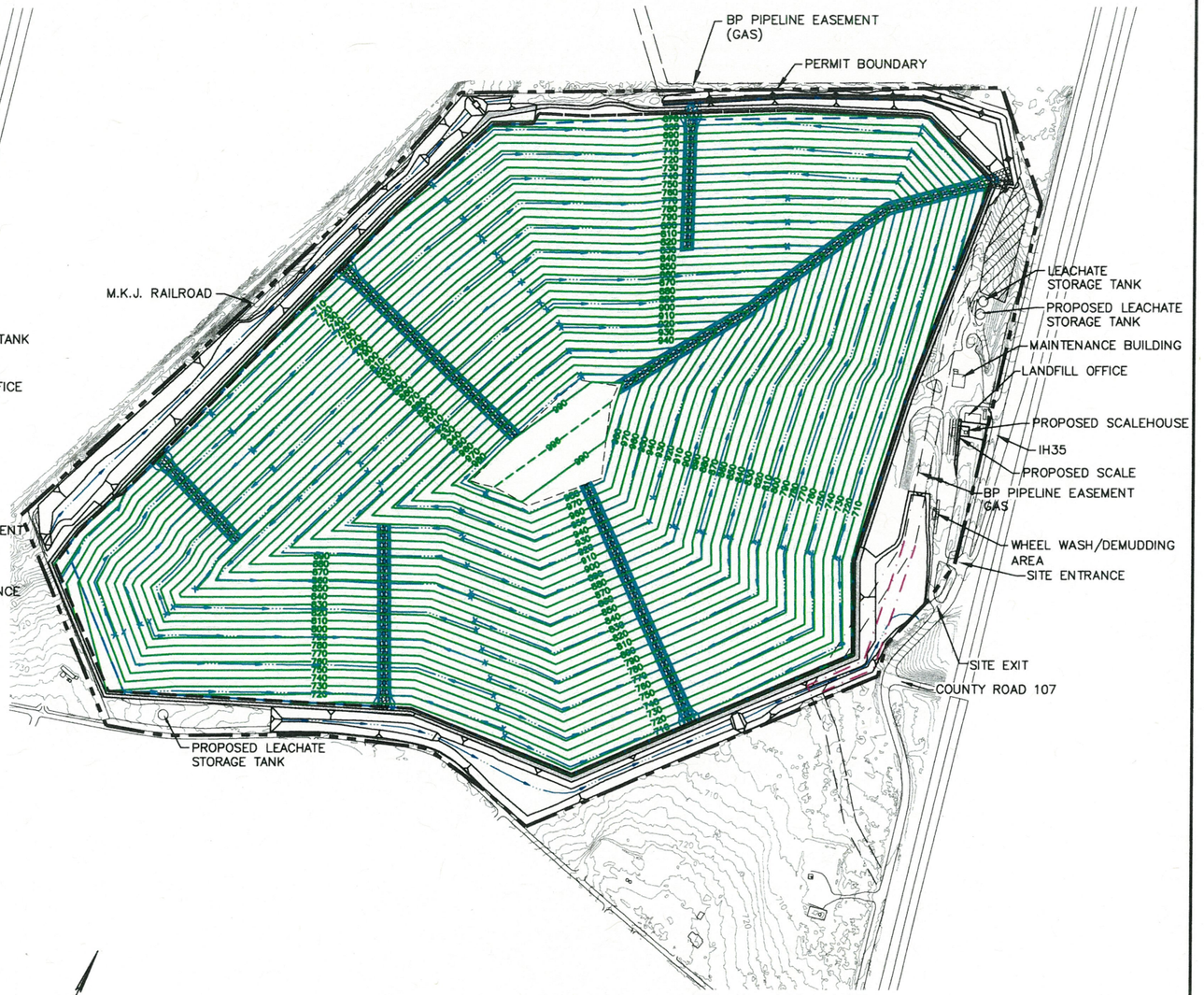
FIGURE 4



PERMITTED LANDFILL COMPLETION PLAN



PROPOSED LANDFILL COMPLETION PLAN

0 300 600
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 5-LANDFILL COMP. PLAN.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

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EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 5

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O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 5-LANDFILL COMPLETION PLAN.dwg, jwilson, 1:2

ATTACHMENT C

LANDFILL COMPLETION PLAN

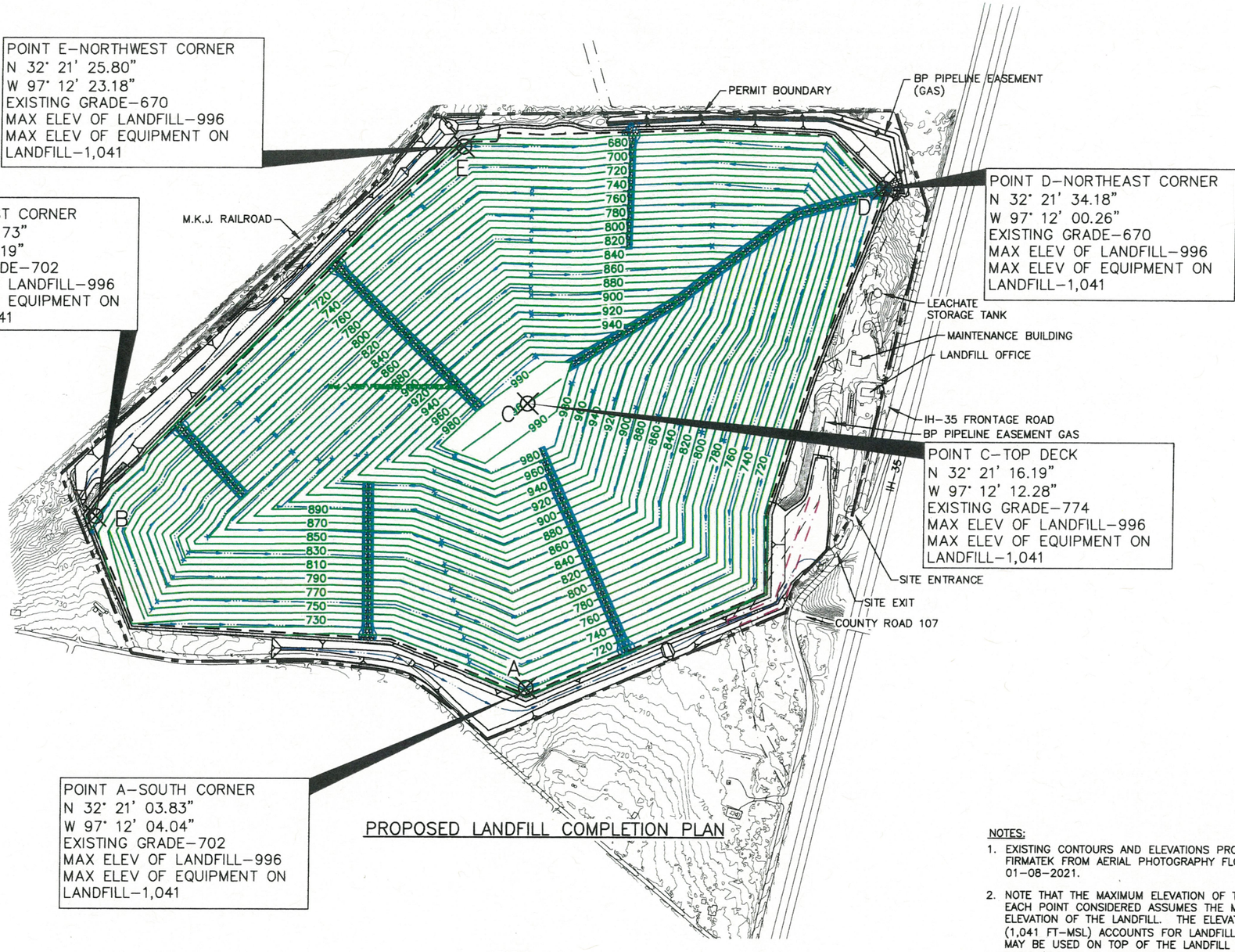
POINT E–NORTHWEST CORNER
N 32° 21' 25.80"
W 97° 12' 23.18"
EXISTING GRADE–670
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041

POINT B–WEST CORNER
N 32° 21' 00.73"
W 97° 12' 31.19"
EXISTING GRADE–702
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041

POINT A–SOUTH CORNER
N 32° 21' 03.83"
W 97° 12' 04.04"
EXISTING GRADE–702
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041

POINT D–NORTHEAST CORNER
N 32° 21' 34.18"
W 97° 12' 00.26"
EXISTING GRADE–670
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041

POINT C–TOP DECK
N 32° 21' 16.19"
W 97° 12' 12.28"
EXISTING GRADE–774
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041



PROPOSED LANDFILL COMPLETION PLAN

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01–08–2021.
2. NOTE THAT THE MAXIMUM ELEVATION OF THE LANDFILL AT EACH POINT CONSIDERED ASSUMES THE MAXIMUM ELEVATION OF THE LANDFILL. THE ELEVATION LISTED (1,041 FT–MSL) ACCOUNTS FOR LANDFILL EQUIPMENT THAT MAY BE USED ON TOP OF THE LANDFILL ON A TEMPORARY BASIS (E.G., A 45–FOOT HIGH DRILL RIG THAT WILL INSTALL LANDFILL GAS RECOVERY WELLS).
3. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 3)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- C ANALYSIS POINT ON FAA FORM 7460 (SEE NOTE 2)

0 300 600
SCALE IN FEET

I/IIB-18

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CAD: FAA POINT LOCATIONS.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

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FAA POINT LOCATIONS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1

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Weaver Consultants Group

February 8, 2022
Project No. 0771-368-11-123

Mr. Gary Loftus
Airspace Compliance Program Manager
Federal Aviation Administration
Southwest Region, Airports Division – Safety and Standards Branch
10101 Hillwood Parkway
Fort Worth, Texas 76177

Re: Compliance with Airport Location Restriction
Proposed Turkey Creek Landfill Permit Amendment
Johnson County, Texas

Dear Mr. Loftus:

The purpose of this letter is to request a potential for wildlife hazards determination to demonstrate coordination with the Federal Aviation Administration (FAA), consistent with Texas Administrative Code (TAC) §330.61(i)(5) and §330.545. These regulations require that a permit applicant for a municipal solid waste facility permit amendment to coordinate with the FAA regarding the potential impact of the proposed amendment to existing airports or air traffic; specifically Title 30 TAC §330.545(a) requires the following.

> *"owners or operators of new municipal solid waste landfill units, existing municipal solid waste units vertical or lateral expansions and landfill mining operations that are located within 10,000 feet of any airport runway end used by turbojet aircraft our within 5,000 feet of any airport runway end used by only piston-type aircraft shall demonstrate that the units are designed and operated so that the municipal solid waste landfill unit does not pose a bird hazard to aircraft."*

Title 30 TAC §330.545(d) requires the following.

> *"landfill facilities within a six-mile radius of any small general service airport runway or within a five-mile radius of any large general public commercial airport shall be critically evaluated to determine if an incompatibility exists."*

To assist you in your determination, please find attached the FAA Area Airports Vicinity Map. As shown on the map, one privately-owned airport is identified as being located within the 5,000-foot radius of the landfill (Luscombe Acres Airport). Luscombe is a private use, turf runway airport located south of the Turkey Creek Landfill. A second airport (Block Ranch Airport) is shown as being located within

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the 10,000-foot radius of the landfill. Block Ranch Airport is also a private use, turf runway airport. Also as shown on the map, two additional airports (Drennan Airport and Hodges Air Field) are identified as being located within the 6-mile radius of the landfill. Both airports are private use with asphalt runways. No small general service airport runways or large general public commercial airports are located within the 6-mile radius of the landfill. A summary of the airport locations, use and surface are provided in the below table.

Summary of Airport Characteristics

Name	Location	Distance from Landfill[1]	Surface	Operation
Luscombe Acres Airport (6XS2)	32°20'46.4934"N 97°11'54.8797W	1,300 ft	Turf	Private Use
Block Ranch Airport (TX78)	32°19'45.000"N 97°13'55.000W	9,830 ft	Turf	Private Use
Drennan Airport (3XA0)	32°28'50.000"N 97°13'52.000W	14,000 (2.65 miles)	Asphalt	Private Use
Hodges Air Field (TX67)	32°21'38.160"N 97°18'09.000W	5.5 miles	Asphalt	Private Use

[1] Distance is measured from the nearest point of the landfill permit boundary to the nearest point of the runway.

Additional information included in this submittal for your consideration include.

- Project Summary and Site Location Maps.
- Proposed Landfill Completion Plan. This plan shows Points A through F, which have been evaluated by the FAA. Note that the peak elevation of the landfill only occurs at one point (Point A). The evaluation determined that the proposed structure would not be a hazard to air navigation. Aeronautical Study Nos. 2019-ASW-2131-OE, 2019-ASW-2132-OE, 2019-ASW-2133-OE, 2019-ASW-2134-OE, and 2019-ASW-2135-OE for Evaluation Points A through E have been attached for reference.

The Turkey Creek Landfill is operated in a manner that does not pose a bird hazard to aircraft. Specifically, the Site Operating Plan for the landfill includes requirements to maintain the working face of the landfill, where trash is exposed, to as small of an area as practical. Specific working face sizes are listed in the permit documents to minimize the potential of the site to attract birds. In addition, the site has a bird abatement program which incorporates the use of pyrotechnic devices or other bird control measures used on an as-needed basis to minimize the bird population at the site.

Your assistance with this matter is sincerely appreciated. Please call if you have any questions or need additional information.

Sincerely,
Weaver Consultants Group, LLC

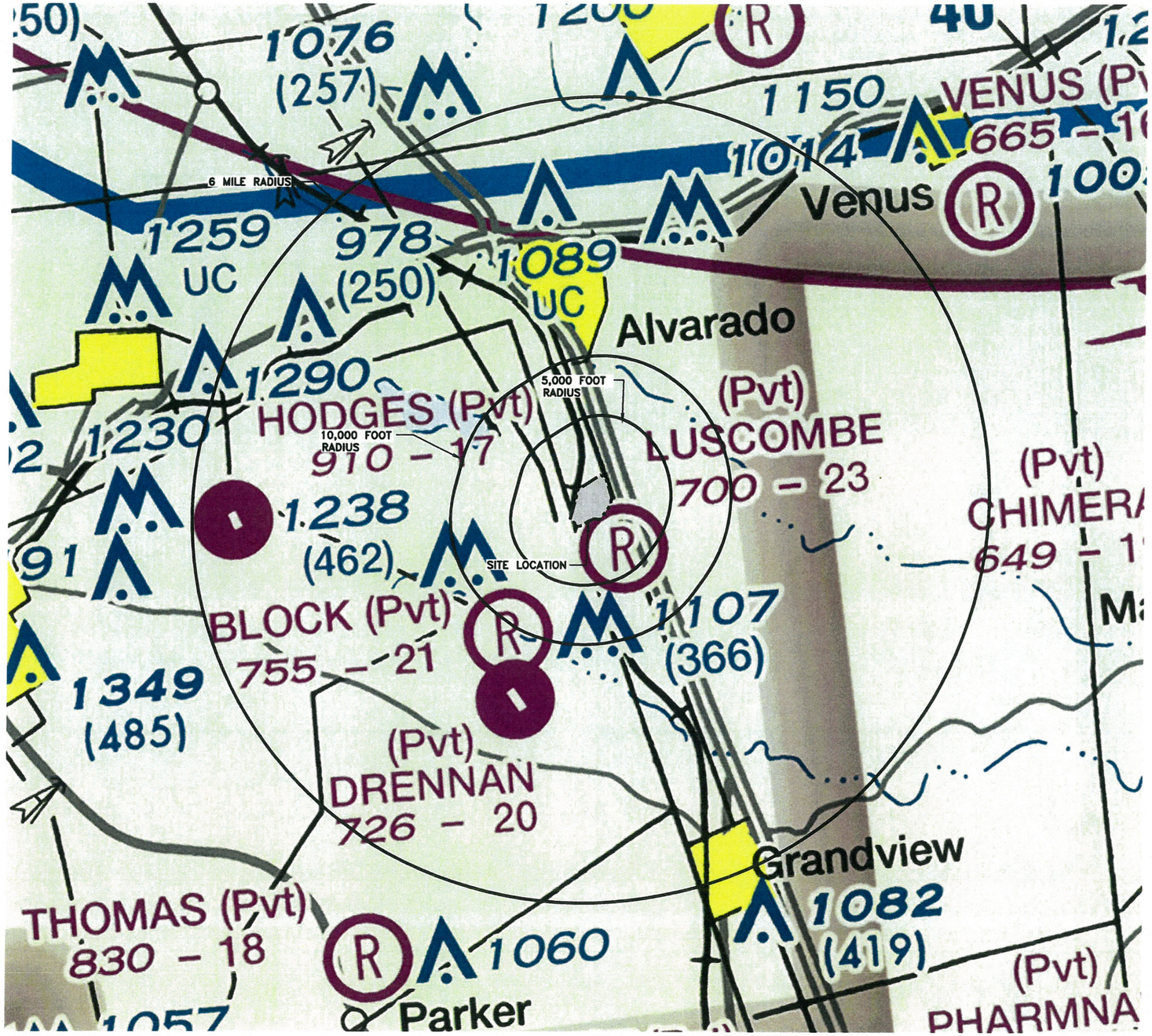
Charles R. Marsh, P.E.
Project Director

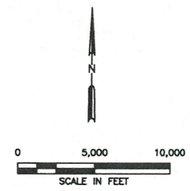
Attachments: Attachment A – FAA Airport Vicinity Map
Attachment B – Project Summary and Site Location Maps
Attachment C – Landfill Completion Plan
Attachment D – FAA Aeronautical Studies

cc: Gary Bartels, Texas Regional Landfill Company, LP

ATTACHMENT A

FAA AIRPORT VICINITY MAP





AIRPORTS

- Other than hard-surfaced runways
- Seaplane Base
- Hard-surfaced runways 1500 ft. or greater
- Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, or VORTAC location.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification. Airports may be public or private.

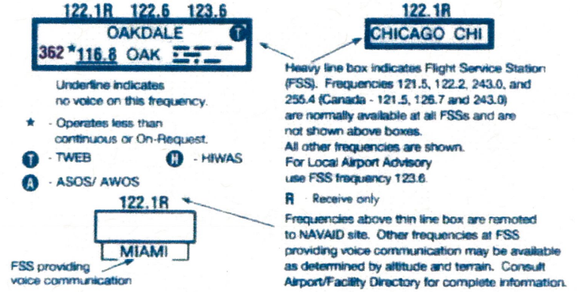
ADDITIONAL AIRPORT INFORMATION

- (R) Private "(Pvt)" - Non-public use having emergency or landmark value.
- Military - Other than hard-surfaced. All military airports are identified by abbreviations AFB, NAS, AAF, etc. For complete airport information consult DOD FLIP.
- (H) Heliport Selected
- (U) Unverified
- Abandoned - paved having landmark value, 3000 ft. or greater
- (F) Ultralight Flight Park Selected

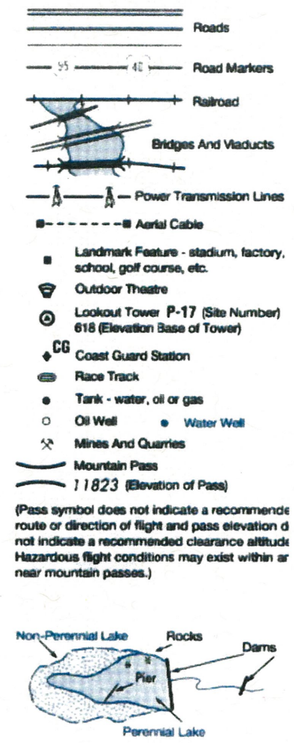
Services-fuel available and field tended during normal working hours depicted by use of ticks around basic airport symbol. (Normal working hours are Mon thru Fri 10:00 A.M. to 4:00 P.M. local time.) Consult A/FD for service availability at airports with hard-surfaced runways 1500 ft. or greater.

☆ Rotating airport beacon in operation Sunset to Sunrise.

RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES



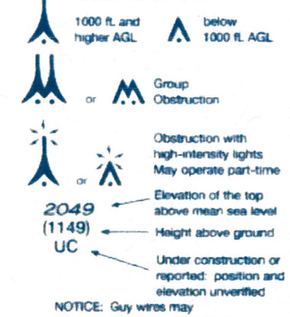
TOPOGRAPHIC INFORMATION



(Pass symbol does not indicate a recommende route or direction of flight and pass elevation d not indicate a recommended clearance altitude Hazardous flight conditions may exist within ar near mountain passes.)



OBSTRUCTIONS



NOTICE: Guy wires may extend outward from structures.

NOTES:

1. THIS MAP REPRODUCED FROM THE FAA DALLAS–FORT WORTH SECTIONAL AERONAUTICAL CHARTS DATED MARCH 1, 2018.
2. THERE ARE NO PUBLIC AIRPORTS WITHIN A 10,000 FOOT RADIUS OF THE SITE.
3. THERE ARE FOUR SMALL PRIVATELY OWNED, PRIVATE USE AIRPORTS WITHIN A 6–MILE RADIUS OF THE SITE.

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DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

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MAJOR PERMIT AMENDMENT
AREA AIRPORTS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1

ATTACHMENT B

PROJECT SUMMARY AND SITE LOCATION MAPS

Project Summary
Turkey Creek Landfill Expansion
Johnson County, Texas

Introduction

Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain authorization for an expansion of the existing Turkey Creek Landfill. This landfill expansion project will provide long-term disposal capacity for municipal solid waste that is generated in the area. The permit application will be submitted to the Texas Commission on Environmental Quality (TCEQ). The application will undergo a detailed review by the TCEQ before the permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed landfill expansion. The following subsections detail information regarding the owner and operator of the site, general site information, and a summary of the proposed site design.

Owner/Operator Information

The Turkey Creek Landfill is owned and operated by Texas Regional Landfill Company, LP (previously IESI TX Landfill, LP), a subsidiary of Waste Connections, Inc. Waste Connections, Inc. is one of the leading providers of solid waste services in the nation and provides services to residential, municipal and commercial customers across the country.

Site Information

The following drawings are attached to this summary.

- Figure 1 – Site Location Map. This drawing shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This drawing shows the existing permitted landfill permit boundary and the limits of disposal area on a USGS map.
- Figure 3 – Aerial Photograph. This figure details the existing permitted landfill permit boundary and limits of waste disposal area on an aerial photograph.
- Figure 4 – Site Plan. This plan highlights the existing permitted landfill permit boundary and the limits of disposal area on a detailed topographic map.
- Figure 5 – Existing and Proposed Landfill Completion Plan. This Plan provides a comparison between the currently permitted landfill and the proposed changes to the landfill completion plan.

Site History

The Turkey Creek Landfill is an existing 219.6-acre municipal solid waste (MSW) landfill (TCEQ Permit No. MSW-1417C) located approximately 2.5 miles south of the City of Alvarado in Johnson County, Texas. The site was originally permitted as a 91-acre Type I MSW disposal facility in 1983 (Permit No. MSW-1417). A permit amendment (MSW-1417A) was issued in 1988 which did not add acreage, but made more efficient use of the permitted area. The permit was amended in 1991 (Permit No. MSW-1417B). This amendment increased the permit boundary to its currently permitted acreage (219.6 acres). The permit was amended again in 2020 (Permit No. MSW-1417C). This amendment increased the height from 834 feet mean sea level (ft-msl) to 946 ft-msl. The currently permitted waste disposal footprint is approximately 146.4 acres.

Design Summary

The following information presents a summary of the design and operations of the proposed Turkey Creek Landfill expansion.

- The Turkey Creek Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-1417C). The existing landfill currently serves residences and businesses in the communities of Johnson County and nearby counties.
- With this expansion, the existing 219.6-acre permit boundary footprint will not be expanded. The permitted limits of waste will be expanded from approximately 146.4 acres to approximately 172.0 acres. The current peak elevation of 946 feet mean sea level (msl) will be expanded vertically to 996 feet msl.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the Turkey Creek Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes as approved by TCEQ.
- Access to the site will be provided via the existing site access roads. Based on travel patterns of existing landfill traffic, vehicles bound for the landfill will generally access the site using I-35W and the I-35W frontage road. which is capable of handling the loads associated with landfill traffic.
- A liner and final cover system that meets all regulatory requirements will be used for the solid waste containment system. The design objective of the containment system (final cover, liner, and leachate management systems) is to isolate the solid waste and remove leachate (defined as liquid that has contacted solid waste) that may collect on the liner system. Collected leachate will be stored on-site then transferred to an authorized treatment facility, handled on-site in accordance with the liquid stabilization program, or recirculated to areas with composite liners for use as a compaction aid in the working face. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures,

liner and cover systems follow strict TCEQ-approved quality control procedures, which are performed by a qualified independent licensed professional engineer specialized in landfill construction quality assurance. Each of the containment system components must be thoroughly reviewed and approved by the TCEQ before solid waste is placed in the landfill.

- To control landfill gas (LFG) emissions and minimize the potential for subsurface migration a LFG collection and control system (GCCS) has been installed at the site. The collection system currently consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is conveyed to a nearby plant and converted to energy or conveyed to a LFG flare where it is combusted. The existing LFG system will continued to be expanded to collect LFG from the currently permitted but undeveloped waste fill footprint and the horizontal expansion areas. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control LFG.

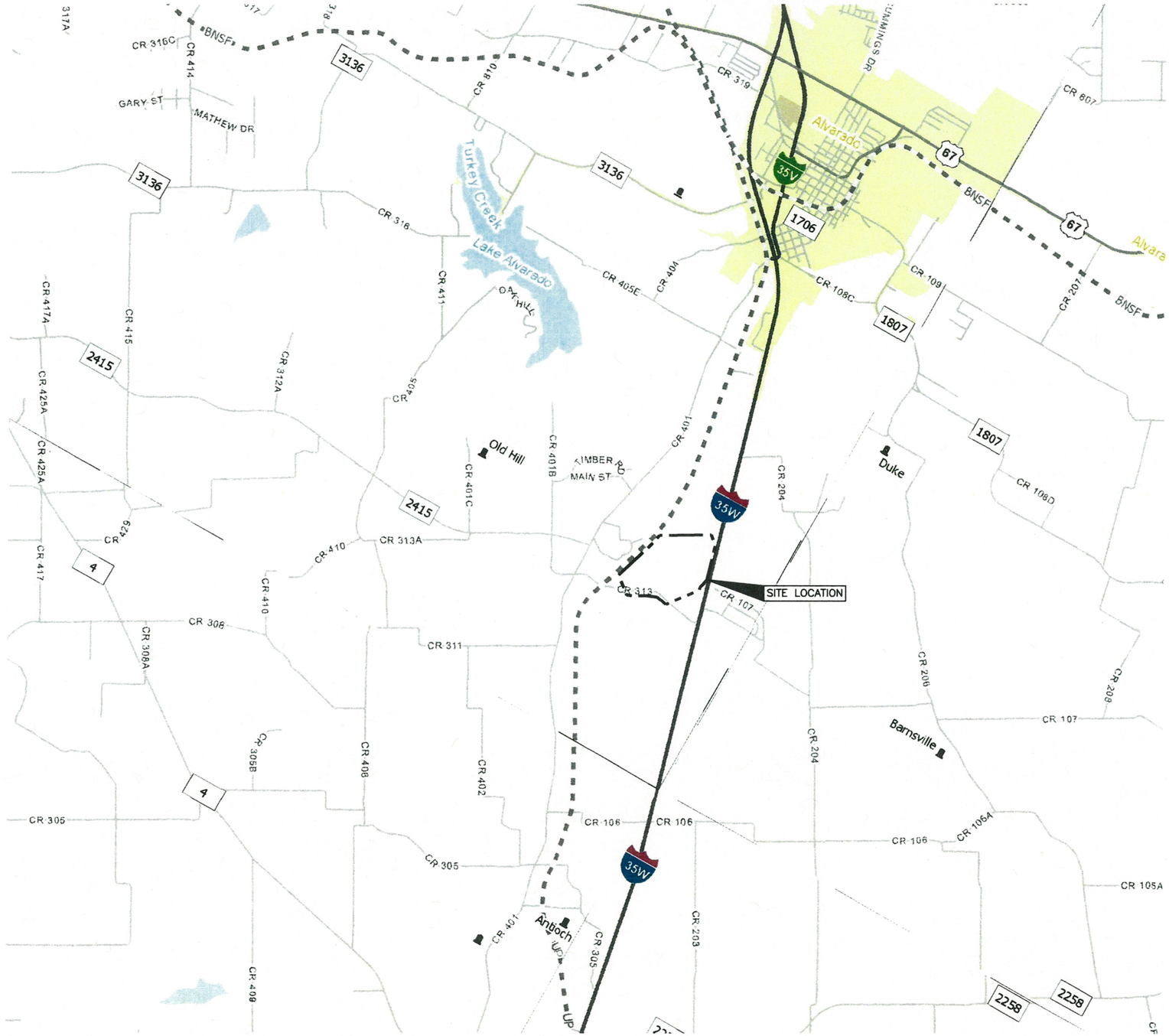
- To verify that the highest level of environmental protection is provided, the following landfill monitoring systems are provided:

  - Groundwater Monitoring System. The purpose of the groundwater monitoring system is to verify the integrity of the containment system and verify that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining water samples from the monitor wells located on the perimeter of the landfill, which are screened in the upper most water table. The water samples are tested by an accredited third-party analytical laboratory.

  - LFG Detection System. The purpose of the LFG detection system is to verify that LFG does not migrate off-site. LFG detection probes have been installed along the current permit boundary perimeter.

  Each of these systems are sampled and tested periodically. The results are filed with the TCEQ and are public record.

- Site Operations. The site will be operated by personnel who have been trained and certified by the TCEQ. A detailed site operating plan will be included in the permit amendment application. The plan will detail the required equipment, personnel, and safety procedures required to operate the site in accordance with TCEQ regulations. The active landfill area will be covered at the end of each workday to prevent potential nuisance conditions such as odors and vectors. The Turkey Creek Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.



N

0 1/2 1
SCALE IN MILES

LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 1-SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

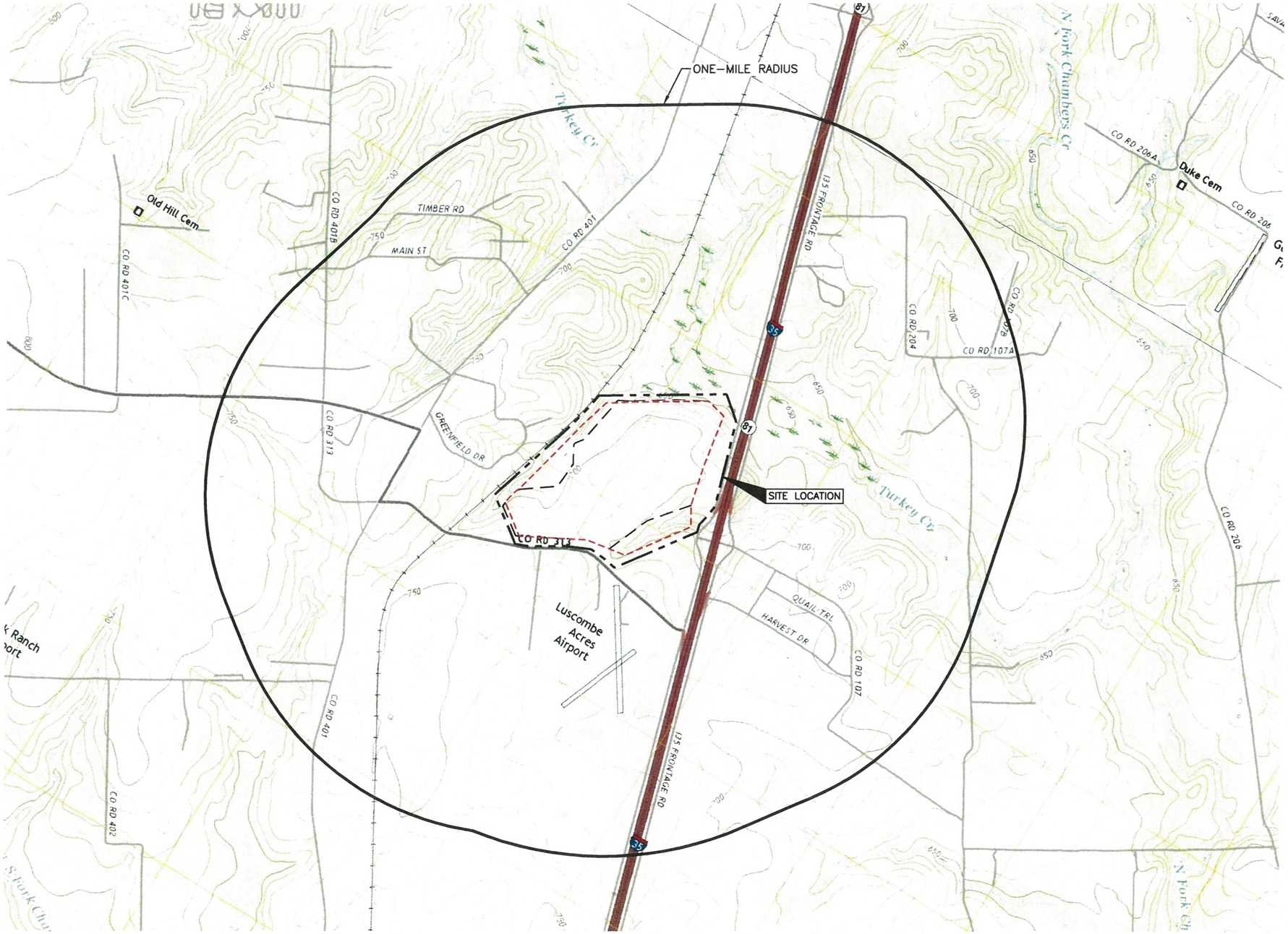
SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 1-SITE LOCATION MAP.dwg, jpuhr, 1:2



0 1000 2000
SCALE IN FEET

LEGEND

PROPERTY/PERMIT BOUNDARY
PERMITTED LIMITS OF WASTE
PROPOSED LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway — Local Connector
Secondary Hwy — Local Road
Ramp — 4WD
Interstate Route — US Route — State Route

ALVARADO, TX
2019

GRANDVIEW, TX
2019

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads..... U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2000 - 2018
Contours.....National Elevation Dataset, 2003 - 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 1981

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads..... U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2002 - 2018
Contours.....National Elevation Dataset, 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 1981

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 2-GENERAL TOPO MAP.DWG

DRAWN BY: SRF
DESIGN BY: DEP
REVIEWED BY: CRM

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

GENERAL TOPOGRAPHIC MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2

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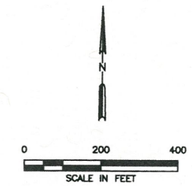
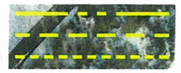
O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 2-GENERAL TOPO MAP.dwg, jpuhr, 1:2





LEGEND



PROPERTY/PERMIT BOUNDARY
PERMITTED LIMITS OF WASTE
PROPOSED LIMITS OF WASTE

NOTES:

1. AERIAL IMAGERY PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

0:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 3-AERIAL PHOTOGRAPH.dwg, jpuhr, 1:2

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

AERIAL PHOTOGRAPH

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 3



NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 4-SITE PLAN.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 4

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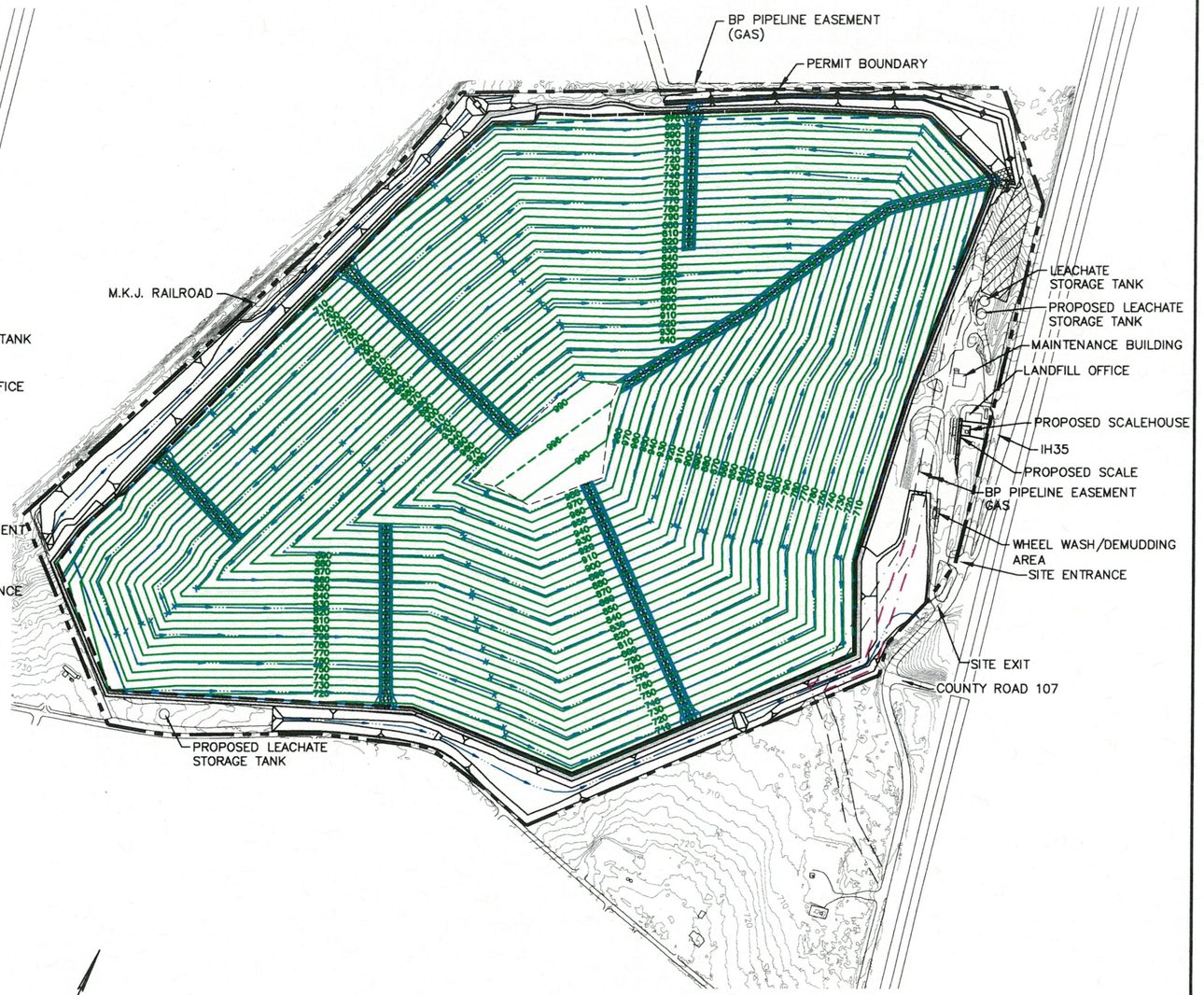
O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 4-SITE PLAN.dwg, jwilson, 1:2



PERMITTED LANDFILL COMPLETION PLAN



PROPOSED LANDFILL COMPLETION PLAN

0 300 600
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 5-LANDFILL COMP. PLAN.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
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PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 5

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 5-LANDFILL COMPLETION PLAN.dwg, jwilson, 1:2

ATTACHMENT C

LANDFILL COMPLETION PLAN

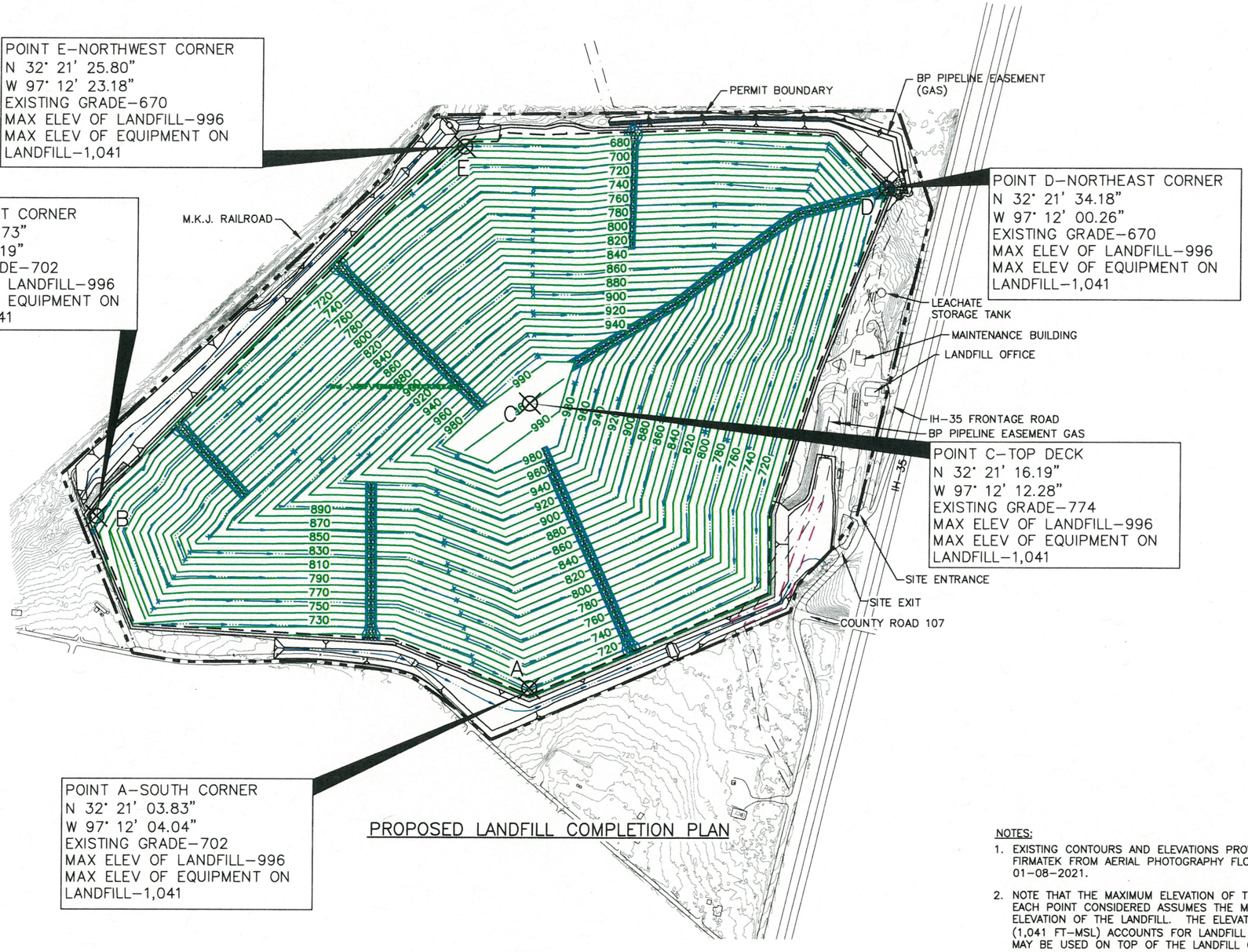
POINT E–NORTHWEST CORNER
N 32° 21' 25.80"
W 97° 12' 23.18"
EXISTING GRADE–670
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041

POINT B–WEST CORNER
N 32° 21' 00.73"
W 97° 12' 31.19"
EXISTING GRADE–702
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041

POINT D–NORTHEAST CORNER
N 32° 21' 34.18"
W 97° 12' 00.26"
EXISTING GRADE–670
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041

POINT C–TOP DECK
N 32° 21' 16.19"
W 97° 12' 12.28"
EXISTING GRADE–774
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041

POINT A–SOUTH CORNER
N 32° 21' 03.83"
W 97° 12' 04.04"
EXISTING GRADE–702
MAX ELEV OF LANDFILL–996
MAX ELEV OF EQUIPMENT ON LANDFILL–1,041



PROPOSED LANDFILL COMPLETION PLAN

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01–08–2021.
2. NOTE THAT THE MAXIMUM ELEVATION OF THE LANDFILL AT EACH POINT CONSIDERED ASSUMES THE MAXIMUM ELEVATION OF THE LANDFILL. THE ELEVATION LISTED (1,041 FT–MSL) ACCOUNTS FOR LANDFILL EQUIPMENT THAT MAY BE USED ON TOP OF THE LANDFILL ON A TEMPORARY BASIS (E.G., A 45–FOOT HIGH DRILL RIG THAT WILL INSTALL LANDFILL GAS RECOVERY WELLS).
3. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 3)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- C ANALYSIS POINT ON FAA FORM 7460 (SEE NOTE 2)

0 300 600
SCALE IN FEET

I/IIB-34

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DATE: 12/2021
FILE: 0771–368–11
CAD: FAA POINT LOCATIONS.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

FAA POINT LOCATIONS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1

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O:\0771\368\EXPANSION 2021\AGENCY COORDINATION\FAA\FAA POINT LOCATIONS.dwg, jwilson, 1:2

ATTACHMENT D

FAA AERONAUTICAL STUDIES

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

Aeronautical Study No.
2022-ASW-1036-OE
Prior Study No.
2019-ASW-2134-OE

Issued Date: 02/03/2022

Gary Bartels
Texas Regional Landfill Company, LP
9100 S Interstate 35W
Alvarado, TX 76009

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

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

Structure:	Existing Municipal Solid Waste Landfill Turkey Creek LF - Point A
Location:	Alvarado, TX
Latitude:	32-21-03.83N NAD 83
Longitude:	97-12-04.04W
Heights:	700 feet site elevation (SE) 341 feet above ground level (AGL) 1041 feet above mean sea level (AMSL)

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

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, red lights-Chapters 4,5(Red),&15.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

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

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

This determination expires on 08/03/2023 unless:

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

6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

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

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

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

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

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

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-ASW-1036-OE.

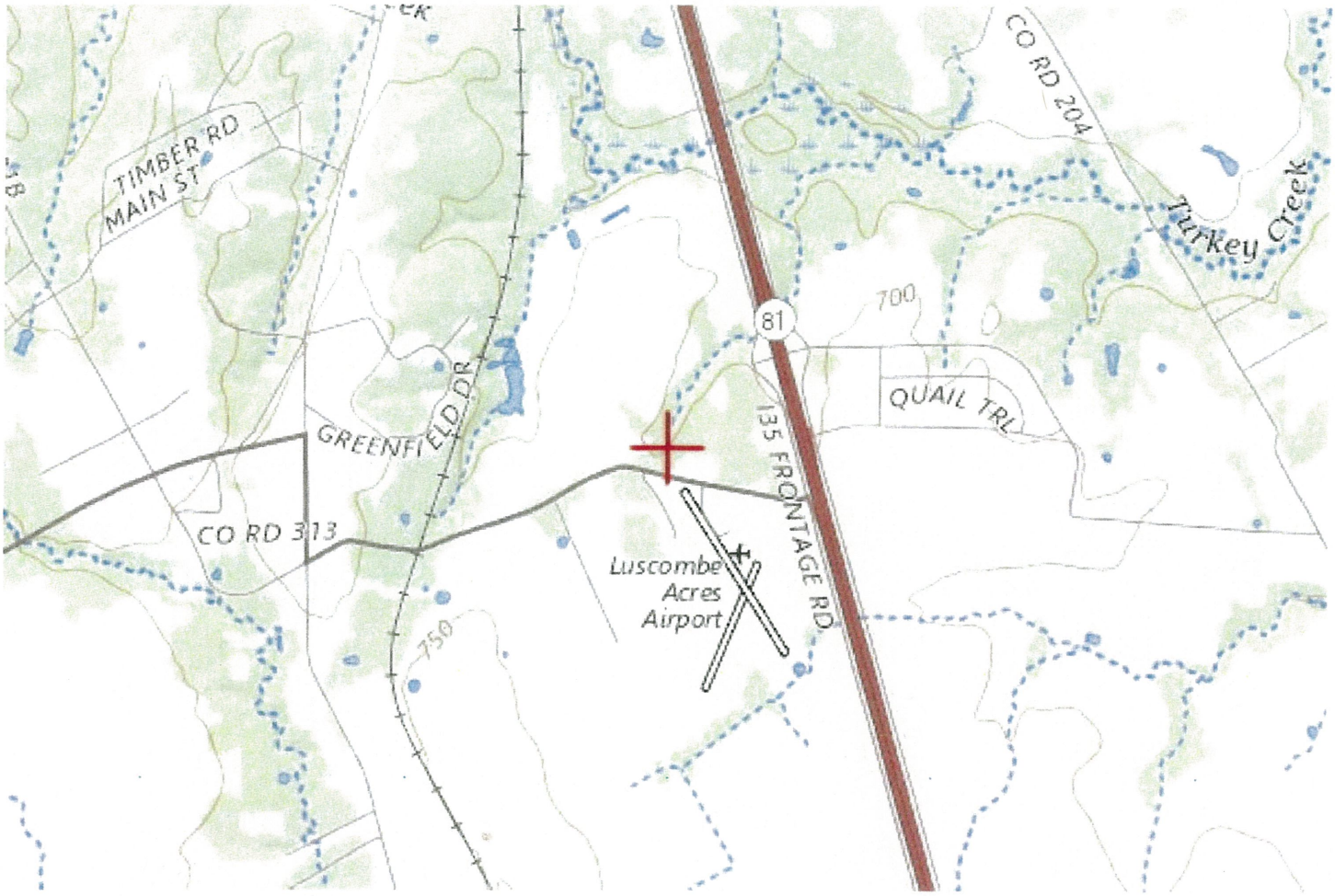
Signature Control No: 508467506-510493314 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

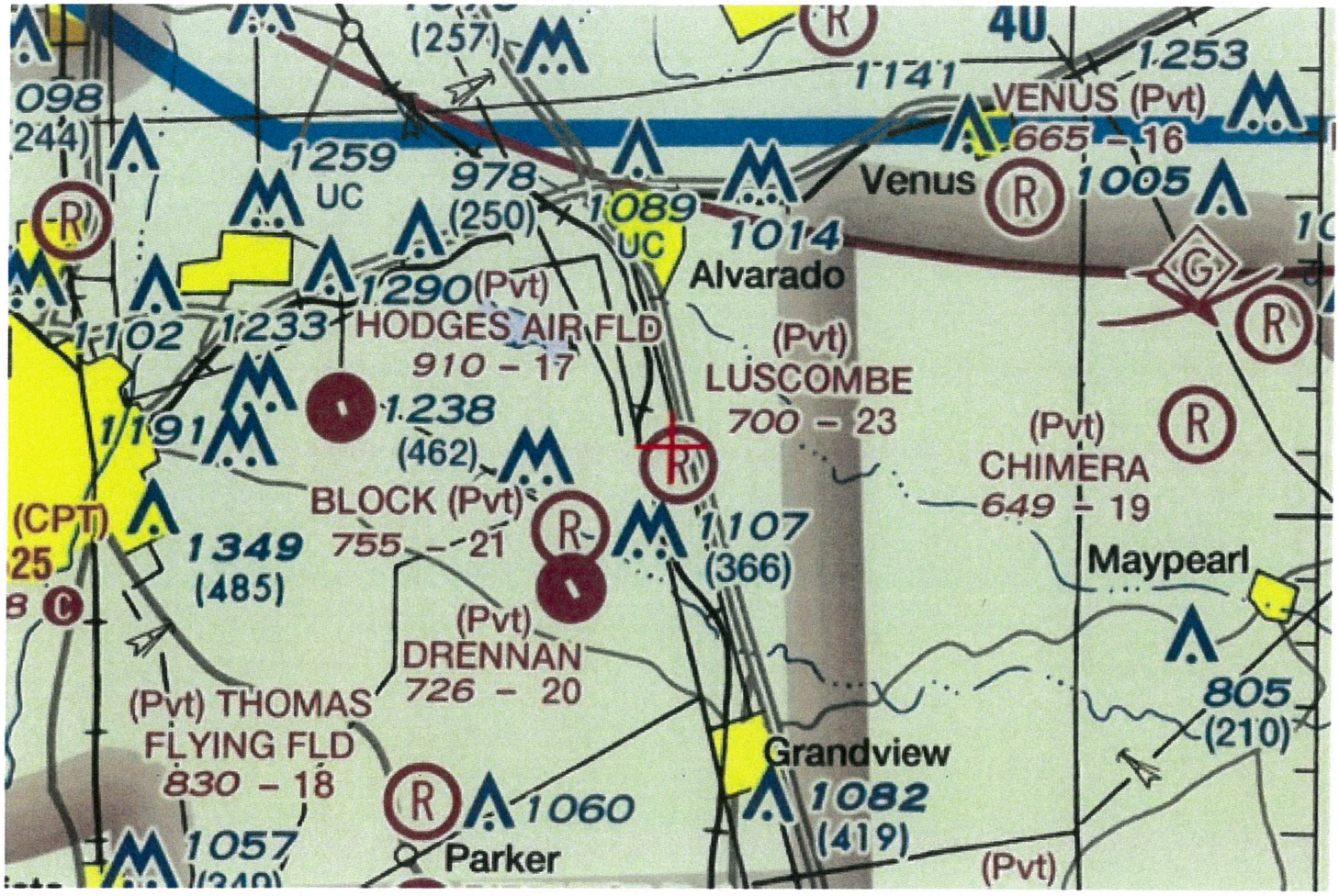
Case Description for ASN 2022-ASW-1036-OE

Increase of permitted landfill waste disposal area.

TOPO Map for ASN 2022-ASW-1036-OE



Sectional Map for ASN 2022-ASW-1036-OE



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

Aeronautical Study No.
2022-ASW-1037-OE
Prior Study No.
2019-ASW-2133-OE

Issued Date: 02/03/2022

Gary Bartels
Texas Regional Landfill Company, LP
9100 S Interstate 35W
Alvarado, TX 76009

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

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

Structure:	Existing Municipal Solid Waste Landfill Turkey Creek LF Point B
Location:	Alvarado, TX
Latitude:	32-21-00.73N NAD 83
Longitude:	97-12-31.19W
Heights:	700 feet site elevation (SE)
	341 feet above ground level (AGL)
	1041 feet above mean sea level (AMSL)

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

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, red lights-Chapters 4,5(Red),&15.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

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

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

This determination expires on 08/03/2023 unless:

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

6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

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

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

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

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

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

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-ASW-1037-OE.

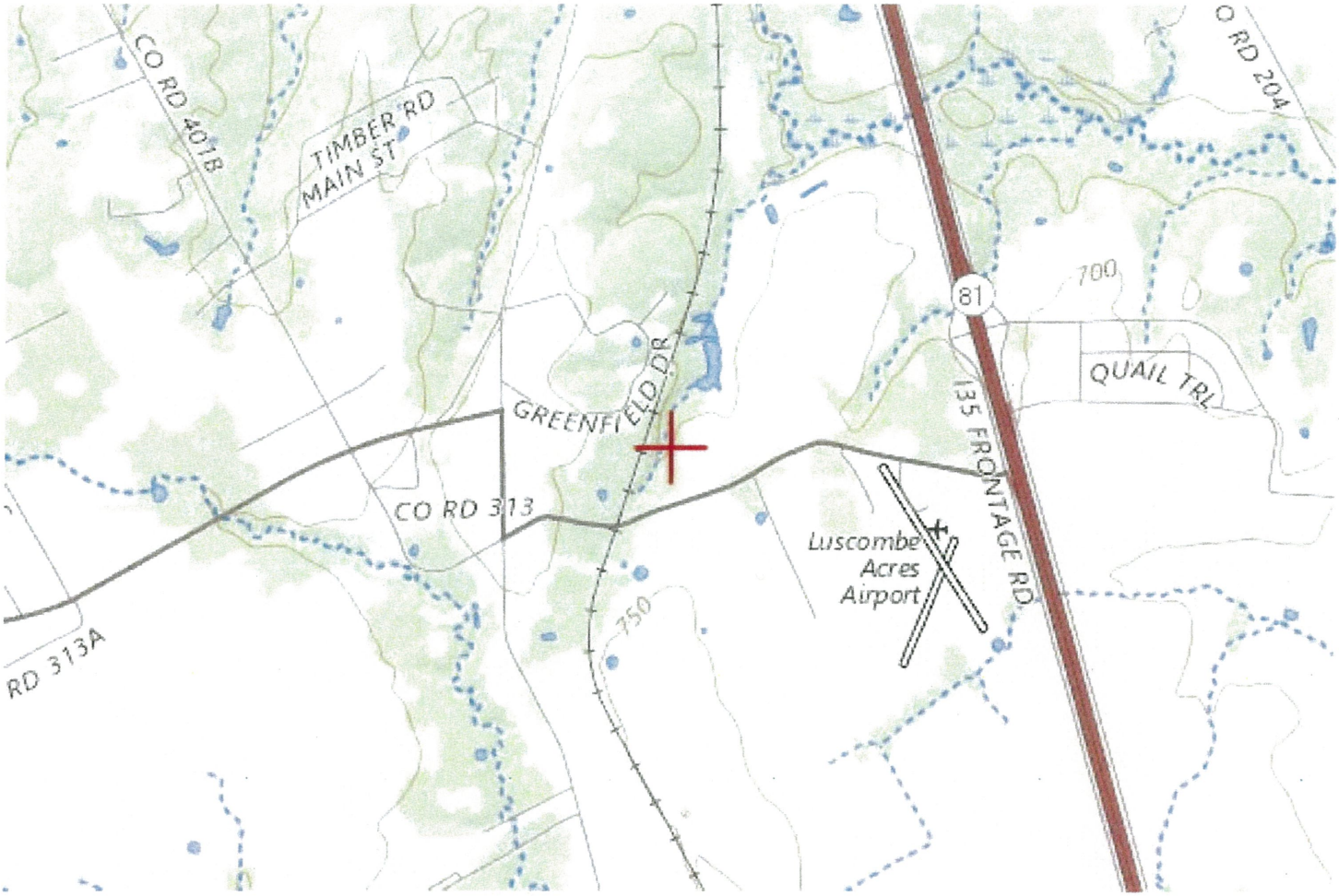
Signature Control No: 508467507-510493316 (DNE)
Andrew Hollie
Specialist

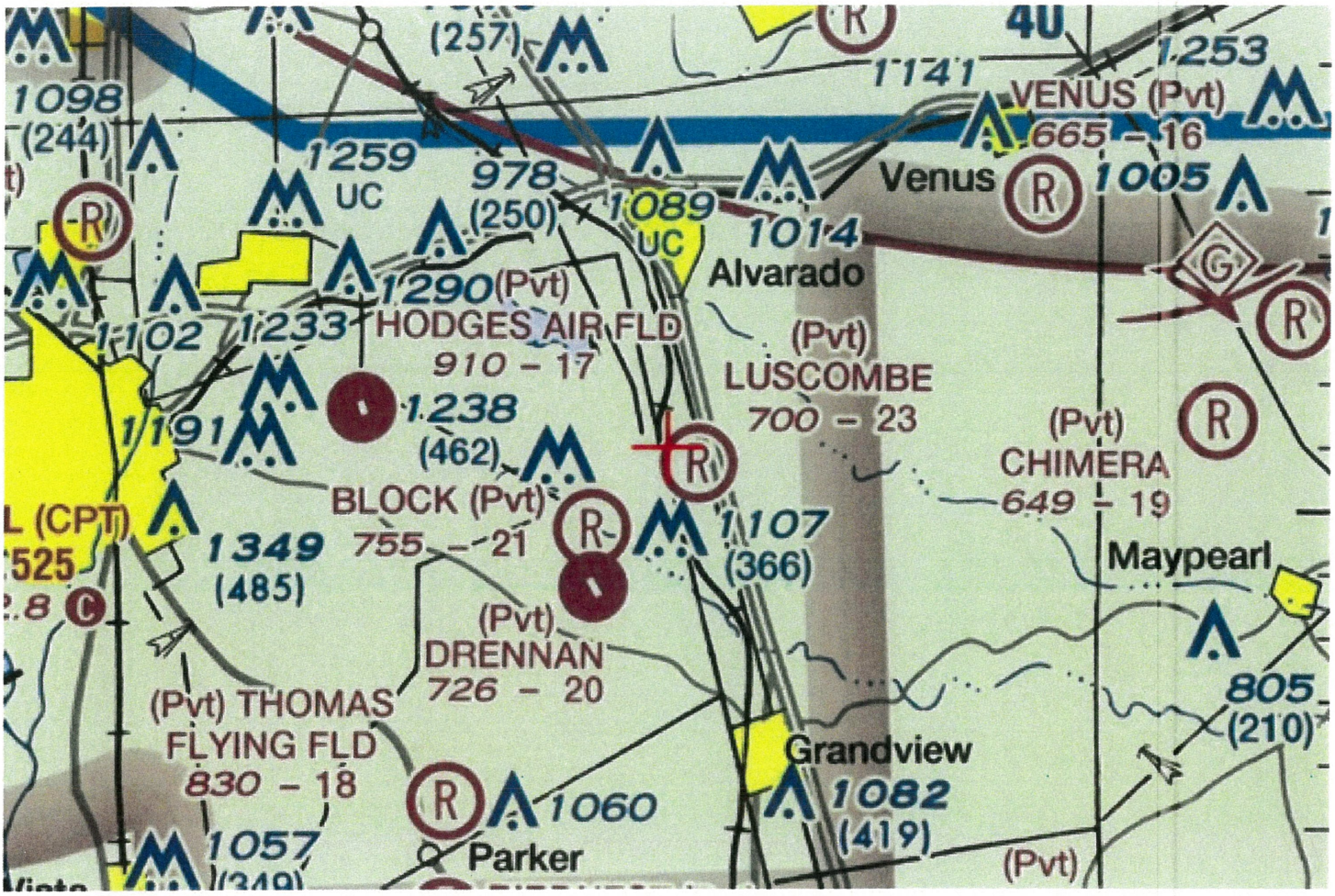
Attachment(s)
Case Description
Map(s)

Case Description for ASN 2022-ASW-1037-OE

Increase of permitted landfill waste disposal area.

TOPO Map for ASN 2022-ASW-1037-OE




(257)
1141
4U
1253
VENUS (Pvt)
665 – 16
1098
(244)
1259
UC
978
(250)
1089
UC
Venus
1005
1014
Alvarado
1290 (Pvt)
HODGES AIR FLD
910 – 17
1102
1233
(Pvt)
LUSCOMBE
700 – 23
1238
(462)
1191
(Pvt)
CHIMERA
649 – 19
BLOCK (Pvt)
755 – 21
1107
(366)
L (CPT)
525
1349
(485)
Maypearl
(Pvt)
DRENNAN
726 – 20
805
(210)
(Pvt) THOMAS
FLYING FLD
830 – 18
Grandview
1082
(419)
1060
1057
Parker
(Pvt)

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

Aeronautical Study No.
2022-ASW-1038-OE
Prior Study No.
2019-ASW-2131-OE

Issued Date: 02/03/2022

Gary Bartels
Texas Regional Landfill Company, LP
9100 S Interstate 35W
Alvarado, TX 76009

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

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

Structure:	Existing Municipal Solid Waste Landfill Turkey Creek LF Point C
Location:	Alvarado, TX
Latitude:	32-21-16.19N NAD 83
Longitude:	97-12-12.28W
Heights:	720 feet site elevation (SE)
	321 feet above ground level (AGL)
	1041 feet above mean sea level (AMSL)

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

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, red lights-Chapters 4,5(Red),&15.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

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

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

This determination expires on 08/03/2023 unless:

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(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within

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

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-ASW-1038-OE.

Signature Control No: 508467509-510493315 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

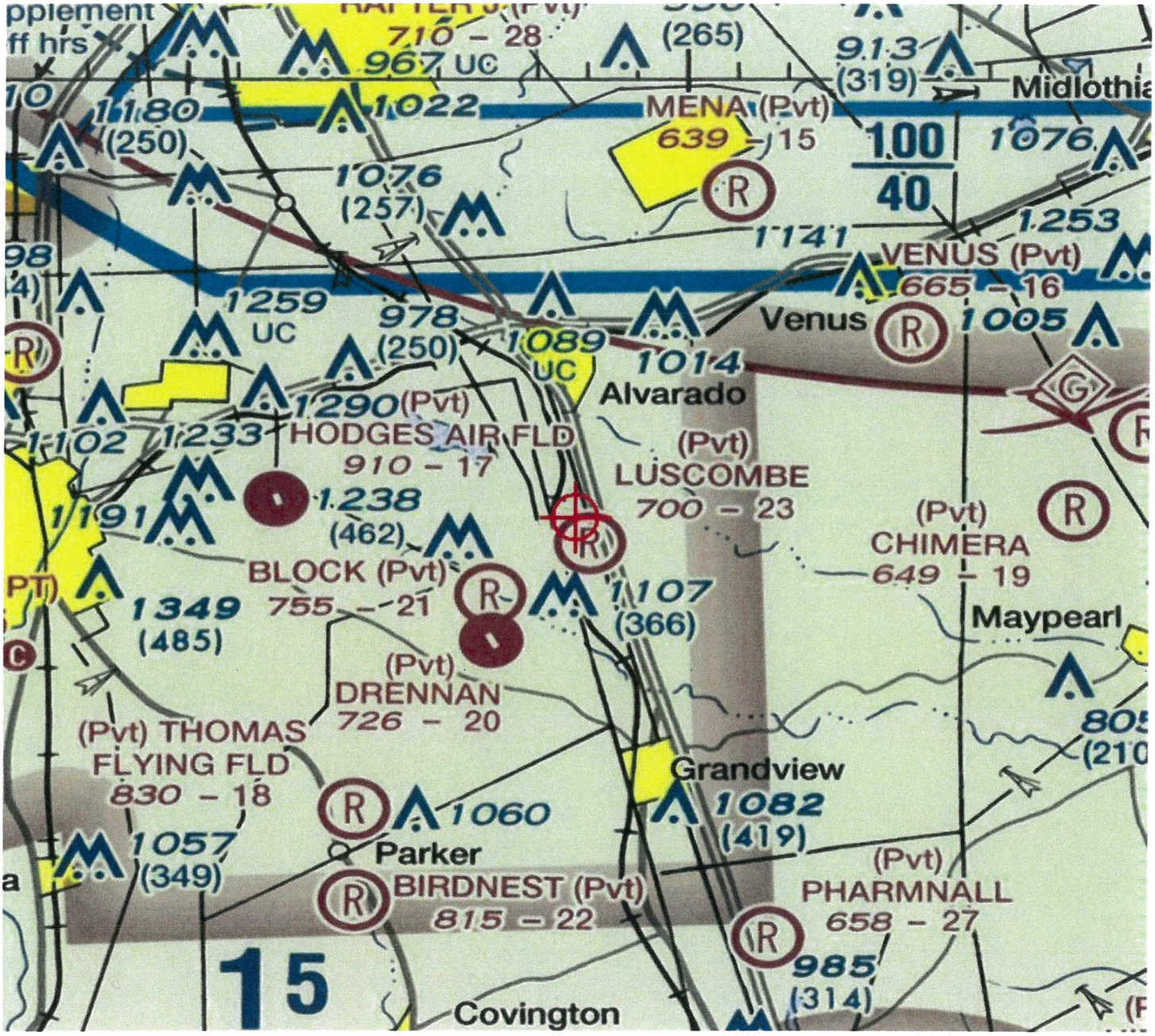
Case Description for ASN 2022-ASW-1038-OE

Increase of permitted landfill waste disposal area.

TOPO Map for ASN 2022-ASW-1038-OE



Sectional Map for ASN 2022-ASW-1038-OE



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

Aeronautical Study No.
2022-ASW-1039-OE
Prior Study No.
2019-ASW-2135-OE

Issued Date: 02/03/2022

Gary Bartels
Texas Regional Landfill Company, LP
9100 S Interstate 35W
Alvarado, TX 76009

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

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

Structure:	Existing Municipal Solid Waste Landfill Turkey Creek LF Point D
Location:	Alvarado, TX
Latitude:	32-21-34.18N NAD 83
Longitude:	97-12-00.26W
Heights:	660 feet site elevation (SE)
	381 feet above ground level (AGL)
	1041 feet above mean sea level (AMSL)

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

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, red lights-Chapters 4,5(Red),&15.

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Signature Control No: 508467511-510493318 (DNE)
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

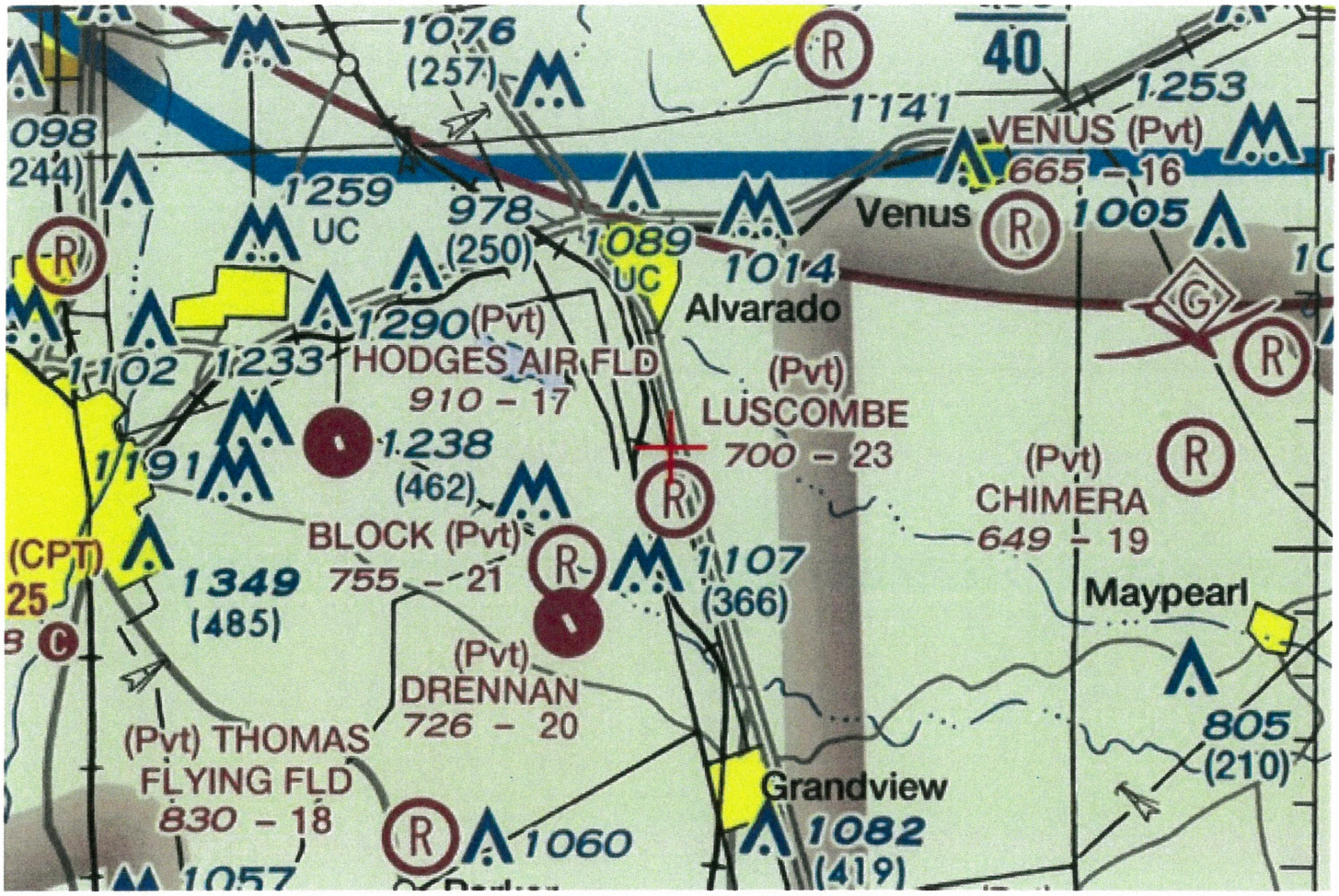
Case Description for ASN 2022-ASW-1039-OE

Increase of permitted landfill waste disposal area.

TOPO Map for ASN 2022-ASW-1039-OE



Sectional Map for ASN 2022-ASW-1039-OE



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

Aeronautical Study No.
2022-ASW-1040-OE
Prior Study No.
2019-ASW-2132-OE

Issued Date: 02/03/2022

Gary Bartels
Texas Regional Landfill Company, LP
9100 S Interstate 35W
Alvarado, TX 76009

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

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If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-ASW-1040-OE.

Signature Control No: 508467513-510493317 (DNE)
Andrew Hollie
Specialist

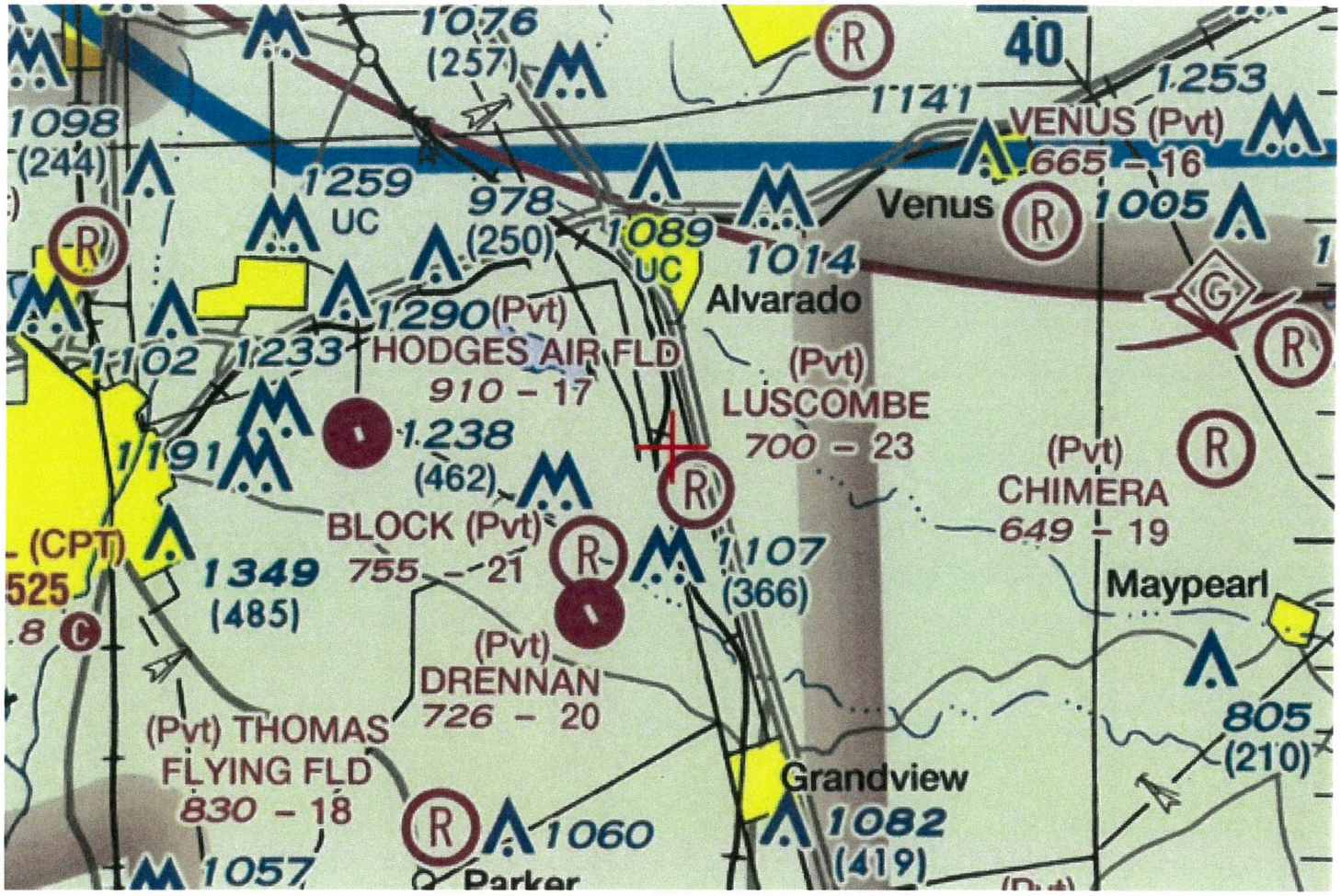
Attachment(s)
Case Description
Map(s)

Increase of permitted landfill waste disposal area.

TOPO Map for ASN 2022-ASW-1040-OE



Sectional Map for ASN 2022-ASW-1040-OE



COORDINATION WITH
TEXAS HISTORICAL COMMISSION

- THC response will be submitted to TCEQ when and if received.
- January 18, 2022 Request Letter requesting THC concurrence that no historic properties are affected by the landfill.

[THC APPROVAL LETTER TO BE INCLUDED]

Weaver Consultants Group

January 18, 2022
Project No. 0771-368-11-123

Mr. Mark Wolfe
Texas Historical Commission
State Historic Preservation Officer
P.O. Box 12276
Austin, Texas 78711-2276

Re: Impact to Cultural Resources Determination
Proposed Turkey Creek Landfill Permit Amendment
Johnson County, Texas

Dear Mr. Wolfe:

The purpose of this letter is to demonstrate coordination with the Texas Historical Commission, consistent with Title 30 Texas Administrative Code (TAC) §330.61(o). This regulation requires that a permit applicant for a vertical expansion of a municipal solid waste facility coordinate with the Texas Historical Commission regarding the potential impact of the referenced project to the cultural resources of the State of Texas.

Weaver Consultants Group, LLC (WCG) is preparing a permit amendment application on behalf of Texas Regional Landfill Company, LP to expand the Turkey Creek Landfill located in Johnson County, Texas. The expansion will be limited to a vertical increase in the height of the landfill and will not change the permit boundary or limits of waste disposal included in the current Texas Commission on Environmental Quality (TCEQ) permit. The following are provided to assist you in your determination.

- Attachment A – Project Summary and Site Location Maps
- Attachment B – Report prepared by AR Consultants, Inc. (ARC), dated July 19, 2018

As presented in the ARC report, much of the waste footprint has previously been disturbed, and that "based upon a review of the historic maps and aerial imagery, ARC concludes that there is little potential for encountering historic sites within the project boundary."

To verify compliance with 30 TAC §330.61(o), we will need to include a letter from the Texas Historical Commission in the permit application. Given the above, it is requested that the Texas Historical Commission concur with our assessment that no significant cultural resources will be affected by the proposed project and that documentation of concurrence be provided to WCG for inclusion in the permit application.

6420 Southwest Boulevard • Suite 206 • Fort Worth, Texas • 76109 • 817-735-9770 • wcgrp.com • Offices Nationwide

Please note that the municipal solid waste permit documents will include a request that if material that may have value as a cultural resource is uncovered during site development the Texas Historical Commission will be notified and construction stopped in that area immediately until proper investigations can be completed.

Your assistance with this matter is sincerely appreciated. Please call if you have any questions or need additional information.

Sincerely,
Weaver Consultants Group, LLC

Charles R. Marsh, P.E.
Project Director

Attachments: Attachment A – Project Summary and Location Maps
Attachment B – Cultural Resources Investigation Report, AR Consultants, Inc., dated July 19, 2018

cc: Gary Bartels, Texas Regional Landfill Company, LP

ATTACHMENT A

PROJECT SUMMARY AND LOCATION MAPS

Project Summary
Turkey Creek Landfill Expansion
Johnson County, Texas

Introduction

Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain authorization for an expansion of the existing Turkey Creek Landfill. This landfill expansion project will provide long-term disposal capacity for municipal solid waste that is generated in the area. The permit application will be submitted to the Texas Commission on Environmental Quality (TCEQ). The application will undergo a detailed review by the TCEQ before the permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed landfill expansion. The following subsections detail information regarding the owner and operator of the site, general site information, and a summary of the proposed site design.

Owner/Operator Information

The Turkey Creek Landfill is owned and operated by Texas Regional Landfill Company, LP (previously IESI TX Landfill, LP), a subsidiary of Waste Connections, Inc. Waste Connections, Inc. is one of the leading providers of solid waste services in the nation and provides services to residential, municipal and commercial customers across the country.

Site Information

The following drawings are attached to this summary.

- Figure 1 – Site Location Map. This drawing shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This drawing shows the existing permitted landfill permit boundary and the limits of disposal area on a USGS map.
- Figure 3 – Aerial Photograph. This figure details the existing permitted landfill permit boundary and limits of waste disposal area on an aerial photograph.
- Figure 4 – Site Plan. This plan highlights the existing permitted landfill permit boundary and the limits of disposal area on a detailed topographic map.
- Figure 5 – Existing and Proposed Landfill Completion Plan. This Plan provides a comparison between the currently permitted landfill and the proposed changes to the landfill completion plan.

Site History

The Turkey Creek Landfill is an existing 219.6-acre municipal solid waste (MSW) landfill (TCEQ Permit No. MSW-1417C) located approximately 2.5 miles south of the City of Alvarado in Johnson County, Texas. The site was originally permitted as a 91-acre Type I MSW disposal facility in 1983 (Permit No. MSW-1417). A permit amendment (MSW-1417A) was issued in 1988 which did not add acreage, but made more efficient use of the permitted area. The permit was amended in 1991 (Permit No. MSW-1417B). This amendment increased the permit boundary to its currently permitted acreage (219.6 acres). The permit was amended again in 2020 (Permit No. MSW-1417C). This amendment increased the height from 834 feet mean sea level (ft-msl) to 946 ft-msl. The currently permitted waste disposal footprint is approximately 146.4 acres.

Design Summary

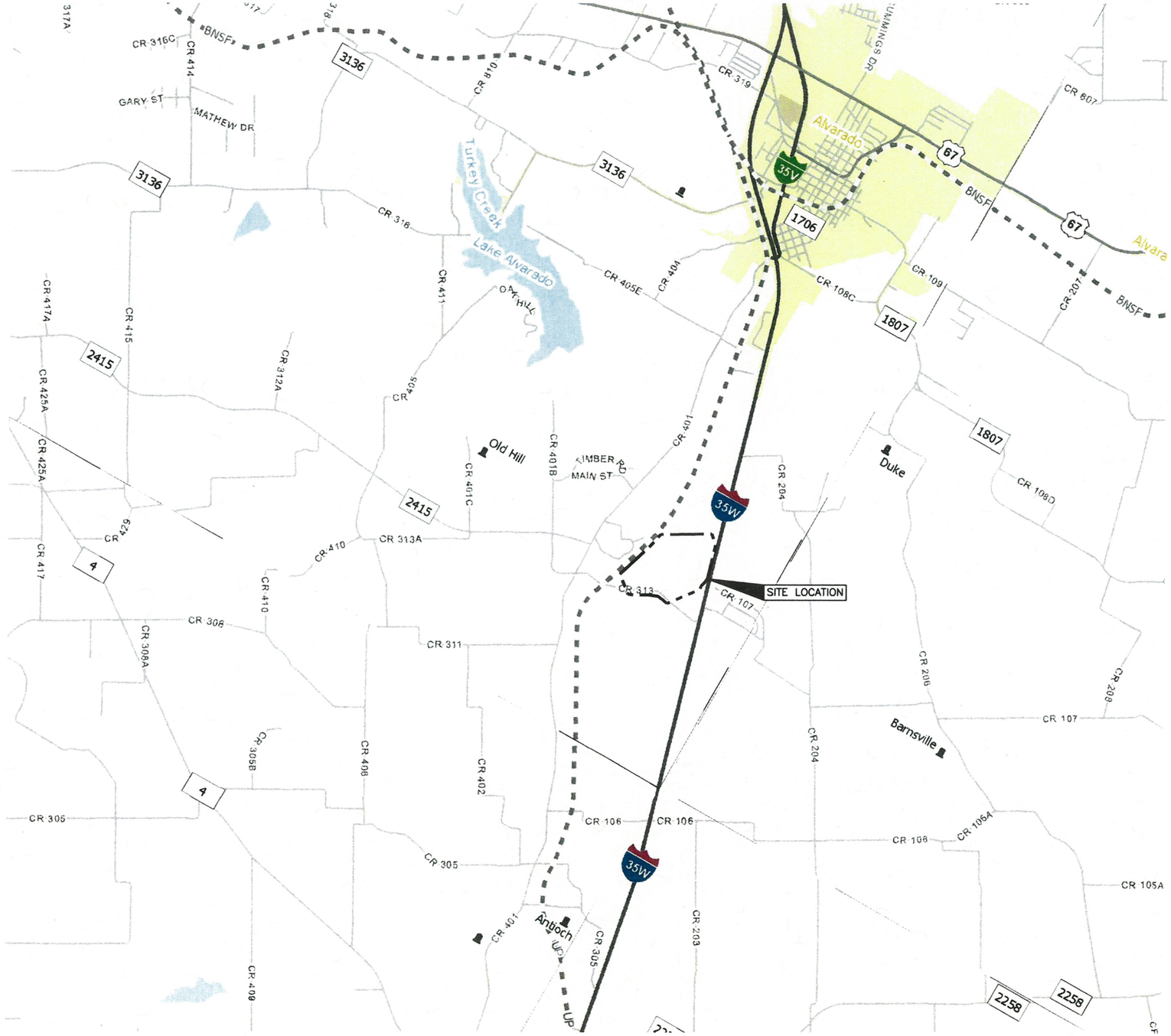
The following information presents a summary of the design and operations of the proposed Turkey Creek Landfill expansion.

- The Turkey Creek Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-1417C). The existing landfill currently serves residences and businesses in the communities of Johnson County and nearby counties.
- With this expansion, the existing 219.6-acre permit boundary footprint will not be expanded. The permitted limits of waste will be expanded from approximately 146.4 acres to approximately 172.0 acres. The current peak elevation of 946 feet mean sea level (msl) will be expanded vertically to 996 feet msl.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the Turkey Creek Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes as approved by TCEQ.
- Access to the site will be provided via the existing site access roads. Based on travel patterns of existing landfill traffic, vehicles bound for the landfill will generally access the site using I-35W and the I-35W frontage road. which is capable of handling the loads associated with landfill traffic.
- A liner and final cover system that meets all regulatory requirements will be used for the solid waste containment system. The design objective of the containment system (final cover, liner, and leachate management systems) is to isolate the solid waste and remove leachate (defined as liquid that has contacted solid waste) that may collect on the liner system. Collected leachate will be stored on-site then transferred to an authorized treatment facility, handled on-site in accordance with the liquid stabilization program, or recirculated to areas with composite liners for use as a compaction aid in the working face. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures,

liner and cover systems follow strict TCEQ-approved quality control procedures, which are performed by a qualified independent licensed professional engineer specialized in landfill construction quality assurance. Each of the containment system components must be thoroughly reviewed and approved by the TCEQ before solid waste is placed in the landfill.

- To control landfill gas (LFG) emissions and minimize the potential for subsurface migration a LFG collection and control system (GCCS) has been installed at the site. The collection system currently consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is conveyed to a nearby plant and converted to energy or conveyed to a LFG flare where it is combusted. The existing LFG system will continued to be expanded to collect LFG from the currently permitted but undeveloped waste fill footprint and the horizontal expansion areas. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control LFG.
- To verify that the highest level of environmental protection is provided, the following landfill monitoring systems are provided:
  - Groundwater Monitoring System. The purpose of the groundwater monitoring system is to verify the integrity of the containment system and verify that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining water samples from the monitor wells located on the perimeter of the landfill, which are screened in the upper most water table. The water samples are tested by an accredited third-party analytical laboratory.
  - LFG Detection System. The purpose of the LFG detection system is to verify that LFG does not migrate off-site. LFG detection probes have been installed along the current permit boundary perimeter.

  Each of these systems are sampled and tested periodically. The results are filed with the TCEQ and are public record.
- Site Operations. The site will be operated by personnel who have been trained and certified by the TCEQ. A detailed site operating plan will be included in the permit amendment application. The plan will detail the required equipment, personnel, and safety procedures required to operate the site in accordance with TCEQ regulations. The active landfill area will be covered at the end of each workday to prevent potential nuisance conditions such as odors and vectors. The Turkey Creek Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.



N

0 1/2 1
SCALE IN MILES

LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 1-SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

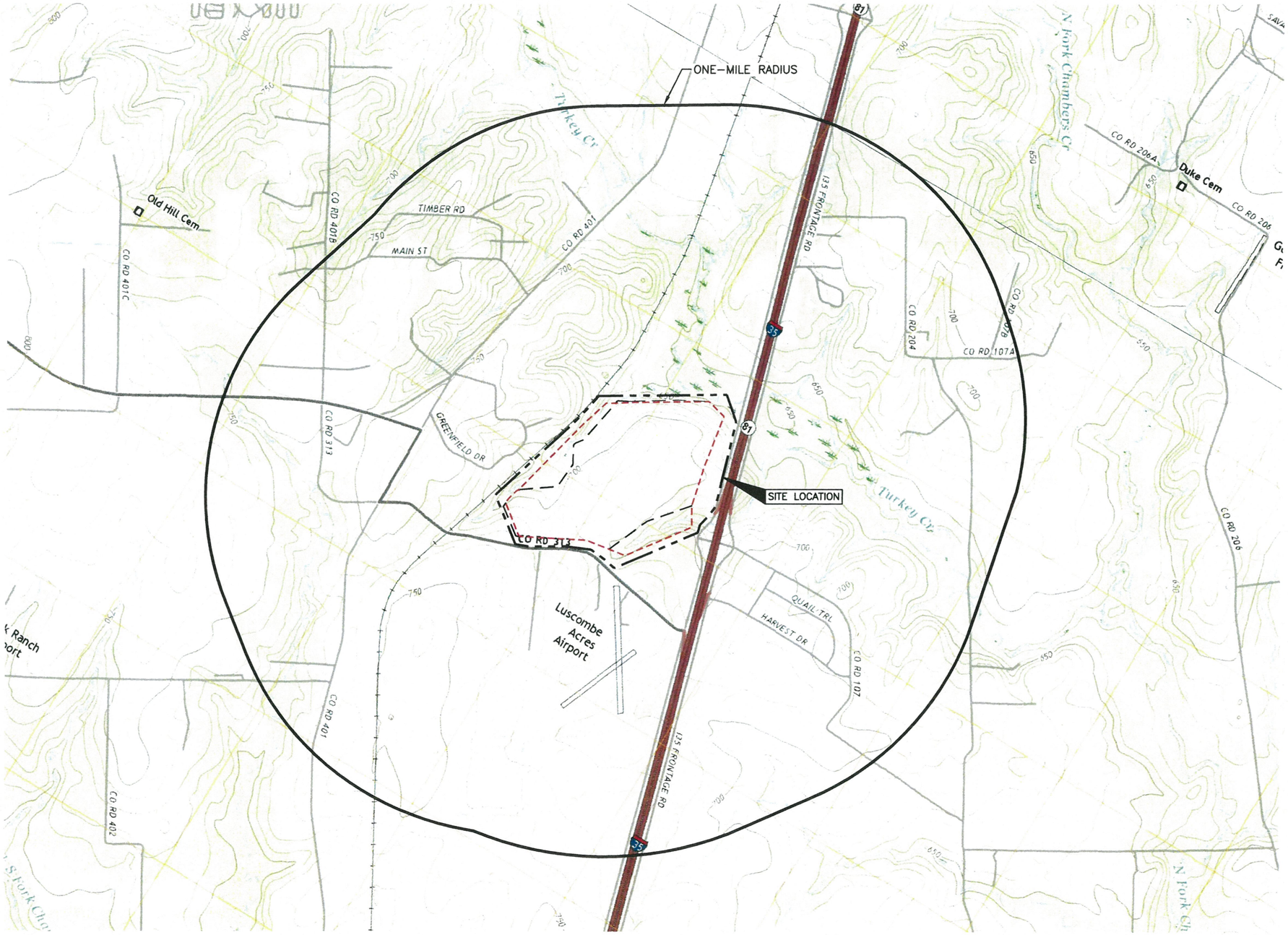
SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1

0:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 1-SITE LOCATION MAP.dwg, jpuhr, 1:2



0 1000 2000
SCALE IN FEET

LEGEND

- PROPERTY/PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
State Route	

ALVARADO, TX
2019

GRANDVIEW, TX
2019

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads.....U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2000 - 2018
Contours.....National Elevation Dataset, 2003 - 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 1981

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
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Imagery.....NAIP, September 2016 - November 2016
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Names.....GNIS, 1979 - 2018
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Contours.....National Elevation Dataset, 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

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- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 2-GENERAL TOPO MAP.DWG
DRAWN BY: SRF
DESIGN BY: DEP
REVIEWED BY: CRM

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

GENERAL TOPOGRAPHIC MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 2

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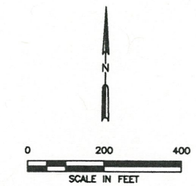
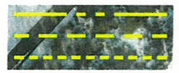
O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 2-GENERAL TOPO MAP.dwg, jpuhr, 1:2





LEGEND



PROPERTY/PERMIT BOUNDARY
PERMITTED LIMITS OF WASTE
PROPOSED LIMITS OF WASTE

NOTES:

1. AERIAL IMAGERY PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

0:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 3-AERIAL PHOTOGRAPH.dwg, jpuhr, 1:2

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DATE: 12/2021
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CAD: FIG 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

AERIAL PHOTOGRAPH

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 3



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- SECTOR BOUNDARY
- MW-7 PERMITTED GROUNDWATER MONITORING WELL
- GMP-12 PERMITTED GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 4-SITE PLAN.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 4

I/IIB-72

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 4-SITE PLAN.dwg, jwilson, 1:2

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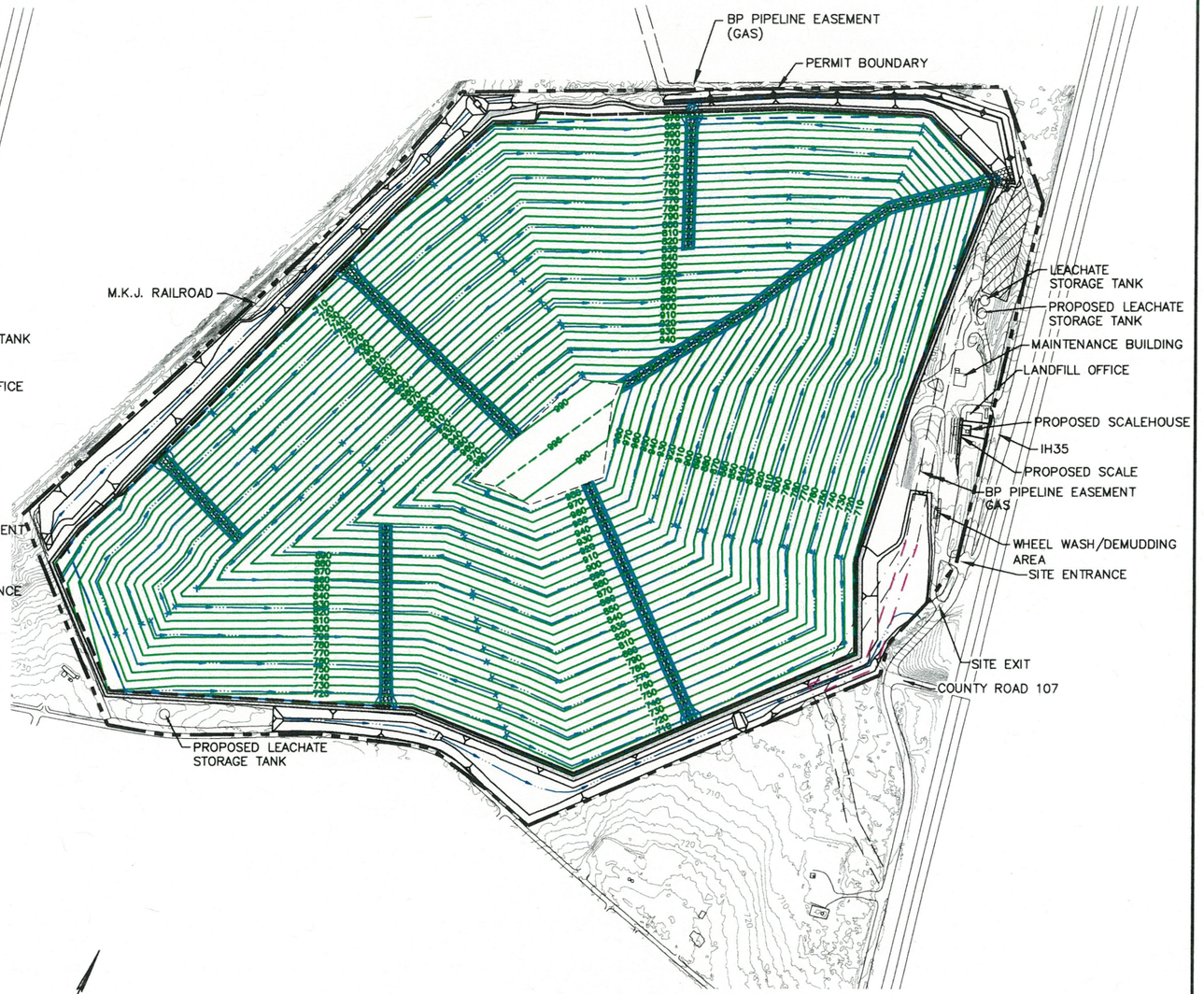
PERMITTED LANDFILL COMPLETION PLAN



PROPOSED LANDFILL COMPLETION PLAN

0 300 600
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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FILE: 0771-368-11
CAD: FIG 5-LANDFILL COMP. PLAN.DWG

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DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
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TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 5

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O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 5-LANDFILL COMPLETION PLAN.dwg, jwilson, 1:2

ATTACHMENT B

CULTURAL RESOURCES INVESTIGATION REPORT, AR CONSULTANTS, INC., DATED JULY 19, 2018

- The cultural resources investigation report was completed in 2018 for Permit MSW-1417C. The report included the whole project property including proposed expansion areas for Permit MSW-1417D.

AR Consultants, Inc.

Archaeological and Environmental Consulting
805 Business Parkway, Richardson, Texas 75081
Phone: (214) 368-0478
Fax: (214) 221-1519
Email: arcdigs@aol.com

July 19, 2018

David Poe
Weaver Consultants Group
6420 Southwest Blvd, Suite 206
Fort Worth, TX 76109

Dear Mr. Poe:

Texas Regional Landfill Company, LP is applying for a landfill permit amendment for the Turkey Creek Landfill which is bounded by I-35W on the east, CR313 on the south, and the Missouri-Kansas-Texas railroad tracks to the west in Alvarado, Johnson County, Texas (Attachment 1). The permit amendment will allow them to raise the landfill from approximately 834 ft to 946 ft (Attachment 2). There are no plans for new ground disturbance. Though much of the waste footprint has already been disturbed, all land within the property boundary (approximately 219.6 acres) is discussed below.

Weaver Consultants Group contracted with AR Consultants, Inc. (ARC) to conduct an evaluation of the prehistoric and historic archaeological potential in the project area. This evaluation begins with a brief description of the topographic and geologic setting, which is followed by a description of historic structure locations shown on 20th century maps and aerials. Data available on the Texas Archeological Sites Atlas (TASA) is then summarized. The letter closes with ARC's conclusions regarding the potential of the project area to contain historic and prehistoric archaeological sites and recommendations regarding a cultural resources survey.

Topography & Geology

The Turkey Creek landfill is located on a ridge south of Turkey Creek, mapped as an intermittent tributary, about 1.42 mi from its confluence with the North Fork of Chambers Creek. Turkey Creek is part of the headwaters that flow into the Trinity River, approximately 15 mi southeast. The project area is mapped on the Late Cretaceous-aged Woodbine Formation that consists of an interlensing sequence of nonmarine, brackish-water, and marine beds of sand, clay, sandstone, and shale (Bureau of Economic Geology 1988). The landfill is underlain by the Minwells-Bastrop-Yahola general soil unit, which consists of gently sloping, deep, slightly acid to moderately alkaline loamy soils. This soil unit is found in the upland terraces (Coburn 1985:10).

Historic Map & Aerial Review

Settlement began in the area of the Turkey Creek Landfill in the late 1850s. Two small communities, Stubblefield and Greenbrier, developed around schools that eventually (ca. 1917) combined to form Greenfield (Elam 2010). Alvarado, the oldest town in Johnson County, is located approximately 3.30 mi to north of the landfill. It was founded in the 1850s and its population steadily grew through the 19th and 20th centuries (Minor 2010). A review of the 1953 aerial imagery reveals the beginnings of development associated with the landfill, particularly the northern portion. By 1982, the landfill was approximately half its current size. The 1961 Grandview, TX 1:24,000-scale USGS topographic map shows no structures within the bounds of the landfill. According to the 1961 (revised 1978) topographic map, structures had been built on the property by 1978: three in the northeast corner and two near the southern boundary. By 2004, the landfill approached its current size. Recent aerial imagery shows that some of these structures are now gone.

Texas Archeological Sites Atlas (TASA) Review & Previous Archaeological Investigations

A search of TASA (2018) revealed that there are no recorded cultural resources or previous cultural resources surveys within the bounds of the Turkey Creek Landfill. Within a mile of the project area, however, there is a single historical marker in addition to one previous cultural resources survey area. In 1983, a historical marker was placed outside the Greenville Baptist Church, approximately 0.67 mi west of the landfill. The marker states that the church was established in 1878 and served members of the early Greenbrier (later Greenfield) community (TASA 2018). In 2000, the Federal Housing Authority attributed a 3.78-acre archaeological survey block for a development approximately 0.23 mi north of the landfill. No other information is available about this survey (TASA 2018). Approximately 1.5 mi east of the current project area, a survey block of comparable size (170 acres) yielded no archaeological sites or other cultural resources. This survey was arranged in 1992 by the Texas Water Development Board for a pipeline (TASA 2018).

Conclusions

Based upon a review of the historic maps and aerial imagery, ARC concludes that there is little potential for encountering historic sites within the project boundary. Topographic maps and aerial imagery reveal that structures do not appear within the perimeter of the landfill until 1978. Given its topographic location and proximity to water, there is some potential for encountering prehistoric sites within the landfill boundaries. Despite this, if Turkey Creek was an intermittent tributary in the past, as it is mapped today, locations along the creek may have not been attractive for prehistoric peoples. This conclusion is bolstered by a review of TASA (2018), which reveals a lack of recorded sites in similar settings along Turkey Creek. The 1992 block survey, approximately 1.5 mi east of the current project area, yielded no cultural resources. Together, this suggests that this area may not have been ideal for prehistoric occupation. Ultimately, raising the elevation of the landfill within its current waste footprint is unlikely to disturb any prehistoric or historic sites.

Recommendations

Because the proposed adjustments will occur where the ground has already been disturbed by landfill activities, ARC recommends no further cultural resources work for the Turkey Creek

Landfill expansion. If activities outside the current waste footprint with potential to disturb new ground will occur, ARC recommends that a cultural resources survey be performed in those areas. This includes evaluations of historic buildings by an architectural historian, if any will be affected by the proposed changes. However, it is unlikely that any prehistoric or historic sites will be encountered.

Sincerely,

K. Cross

Kathryn A. Cross
Archaeologist
AR Consultants, Inc.

References Cited

Bureau of Economic Geology
1988 *Geologic Atlas of Texas, Dallas*. Bureau of Economic Geology, The University of Texas at Austin.

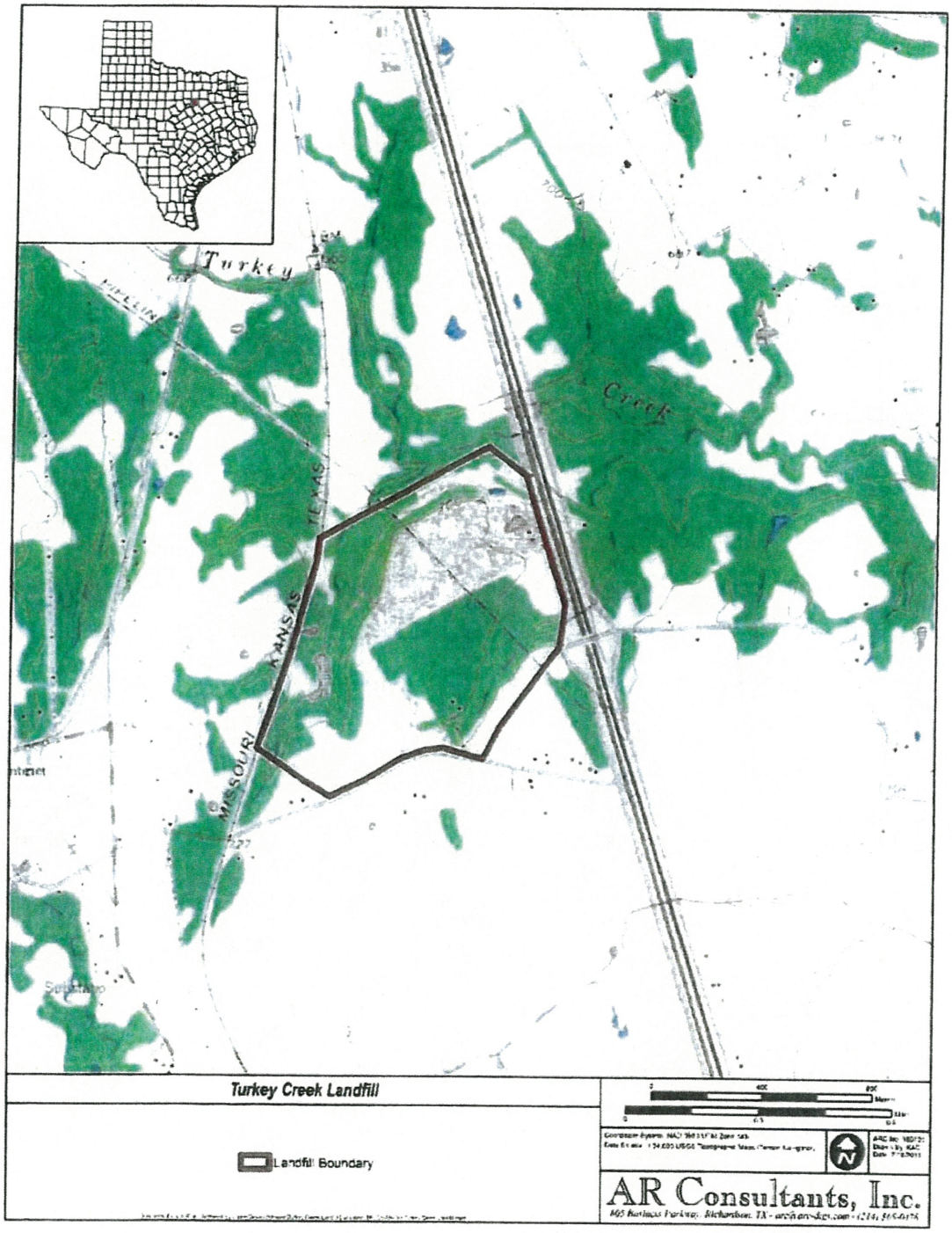
Coburn, Winfred C.
1985 *Soil Survey of Johnson County, Texas*. Soil Conservation Service, United States Department of Agriculture in cooperation with Texas Agricultural Experimental Station.

Elam, Richard
2010 Stubblefield, TX (Johnson County). Electronic Document, http://www.tshaonline.org/handbook/online/articles/hvscp, accessed July 17, 2018.

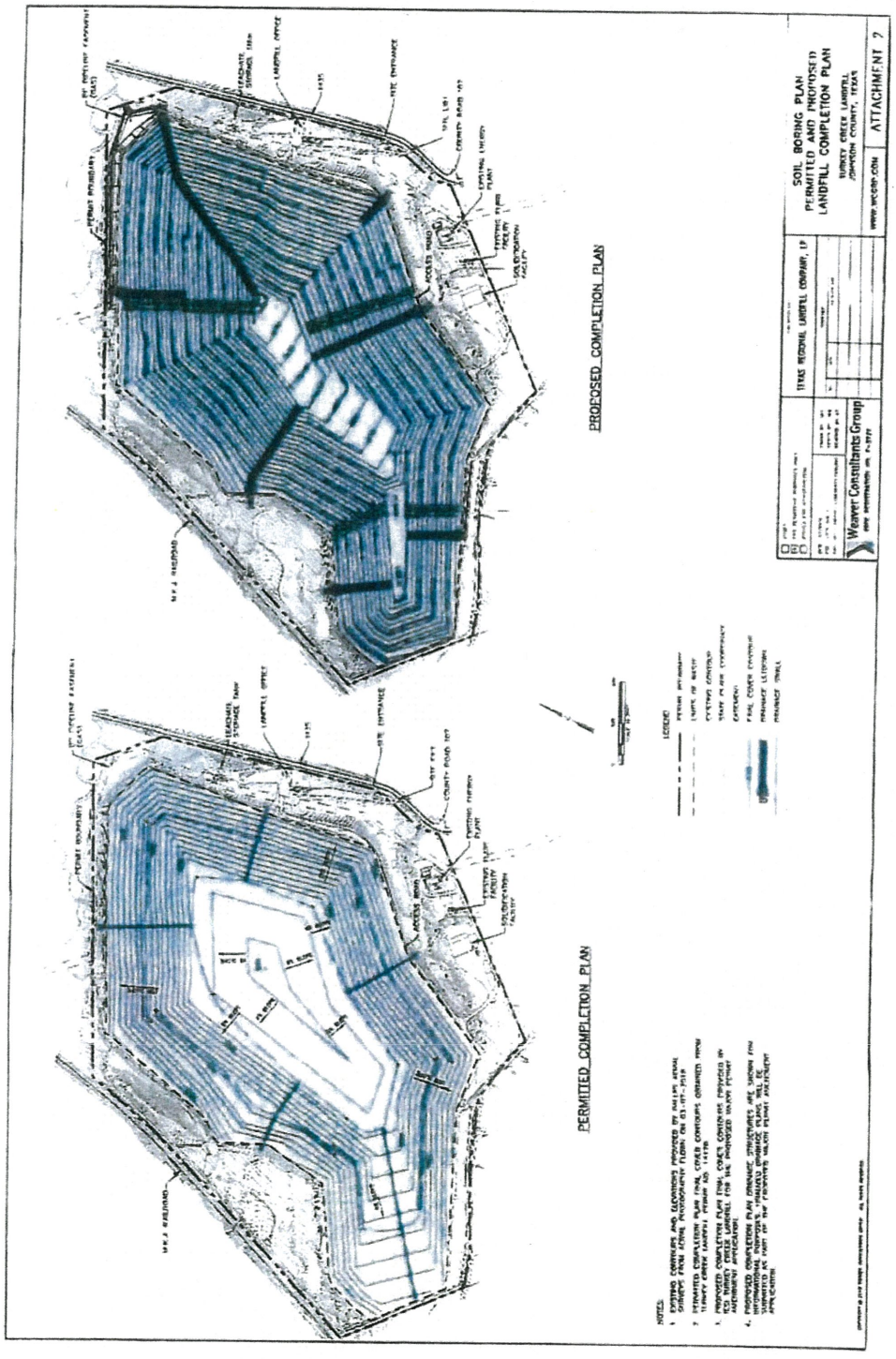
Minor, David
2010 Alvarado, TX. Electronic Document, http://www.tshaonline.org/handbook/online/articles/hvscp, accessed July 17, 2018.

Texas Archeological Sites Atlas
2018 Search for cultural resources near the current project area. Texas Historical Commission Internet site, http://nueces.thc.state.tx.us, accessed July 17, 2018.

Attachment 1. The Turkey Creek Landfill project location shown on portions of the 1961 (revised in 1978) Grandview 7.5' USGS topographic map.



Attachment 2. Existing and proposed completion plan for the Turkey Creek Landfill project.



COORDINATION WITH
TEXAS DEPARTMENT OF TRANSPORTATION
AND
TCEQ TRANSPORTATION DATA AND COORDINATION REPORT FORM FOR MSW TYPE I LANDFILLS (TCEQ – 20719, 8/13/15)

- TxDOT response will be submitted to TCEQ when and if received.
- January 18, 2022 WCG Request for Review Letter (refer to Appendix I/IID – Traffic Study for more information).

[TXDOT APPROVAL LETTER TO BE INSERTED]

Weaver Consultants Group

January 18, 2022
Project No. 0771-368-11-123

Mr. Carl Johnson, P.E.
District Engineer
Texas Department of Transportation, Fort Worth District
2501 SW Loop 820
Fort Worth, Texas 76133

Re: Engineering Study
Turkey Creek Landfill
Johnson County, Texas

Dear Mr. Johnson:

The purpose of this letter, submitted on behalf of Texas Regional Landfill Company, LP, a wholly owned subsidiary of Waste Connections, Inc., is to demonstrate coordination with the Texas Department of Transportation (TxDOT), consistent with Title 30 TAC §330.61(i)(4). This regulation requires that an applicant for a municipal solid waste (MSW) facility coordinate with TxDOT regarding any potential traffic or location restrictions.

Weaver Consultants Group, LLC is preparing a Major Permit Amendment for an existing Type I municipal solid waste (MSW) facility, under contract with Texas Regional Landfill Company, LP to obtain the necessary authorization to expand the existing Turkey Creek Landfill. The existing Turkey Creek Landfill has limited remaining disposal capacity, and the proposed expansion will extend the ability of Texas Regional Landfill Company, LP to collect, process, and dispose of solid waste for Johnson County and surrounding areas. The existing site entrance is located off the southbound Interstate Highway 35 West (IH-35W) Frontage Road immediately north of State Road 107, in Johnson County, Texas.

To assist you in your review, a project summary and site location maps have been provided as an overview of the Major Permit Amendment.

The attached traffic study demonstrates that the site access roads – Interstate 35W, Farm to Market Road 2415, and County Roads 313, 204 and 107 – will provide adequate access to the site now and in the foreseeable future. The landfill has been in operation for many years and the traffic patterns of the solid waste collection vehicles that use area access roads are well established. As a result of the proposed expansion, the volumes of vehicles on the roadway system and into the facility will not increase, and the existing entrance will not be modified. It is expected that the

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traffic patterns will remain consistent with the current traffic patterns. Additionally, please note a permit is not being requested from TxDot for this project. A traffic impact analysis (TIA) is not warranted for the proposed landfill expansion.

To verify compliance with Title 30 TAC §330.61(i)(4), we are required by TCEQ to include a letter from TxDOT in the TS application regarding the adequacy of the site access roads and any traffic or location restrictions at or near the site.

Please call if you have any questions or need additional information.

Sincerely,
Weaver Consultants Group, LLC

Charles R. Marsh, P.E.
Project Director

Attachments: Executive Summary
Turkey Creek Landfill Engineering Study

cc: Gary Bartels, Texas Regional Landfill Company, LP
Nevzat Turan, Weaver Consultants Group, LLC

EXECUTIVE SUMMARY
TURKEY CREEK LANDFILL PROPOSED EXPANSION
ENGINEERING ANALYSIS

This Executive Summary has been prepared for the Engineering Study developed to evaluate the adequacy of the roadways serving the Turkey Creek Landfill Facility (Facility) located in Johnson County, Texas. The Engineering Study generally makes the following conclusions:

- The proposed expansion of the Facility will not increase the volume of trucks entering or exiting the Facility from existing roadways. If completed, the proposed expansion will extend the life of the facility.
- The Facility is currently accessed by a driveway located off of the IH35W frontage road, and via Exit 21 from IH35W.
- The two driveways that serve the facility are each one-way in and one-way out and are separated by a median measuring approximately 160 feet.
- The proposed Facility expansion will not alter the driveways or the entrance to the Facility.
- A permit is not being requested from TxDOT for the proposed expansion. However, it is being requested that TXDOT offer a Letter of No Objection if it is demonstrated that the project meets the requirements of 30 TAC §330.61(i).

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

ENGINEERING STUDY

Prepared for

Texas Regional Landfill Company, LP

January 2022



Prepared by

Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Blvd., Suite 206
Fort Worth, Texas 76109
817-735-9770

Project No. 0771-368-11-122-01

I/IIB-85

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1	**INTRODUCTION**		**1**
	1.1	Purpose	1
	1.2	Summary of Proposed Landfill Expansion	1
2	**TRAFFIC INFORMATION**		**3**
	2.1	Availability and Adequacy of Roads	3
	2.2	Volume of Vehicular Traffic	3
3	**COMPLIANCE WITH HIGHWAY BEAUTIFICATION ACT**		**10**

APPENDIX A
Project Summary and Site Location Maps



1 INTRODUCTION

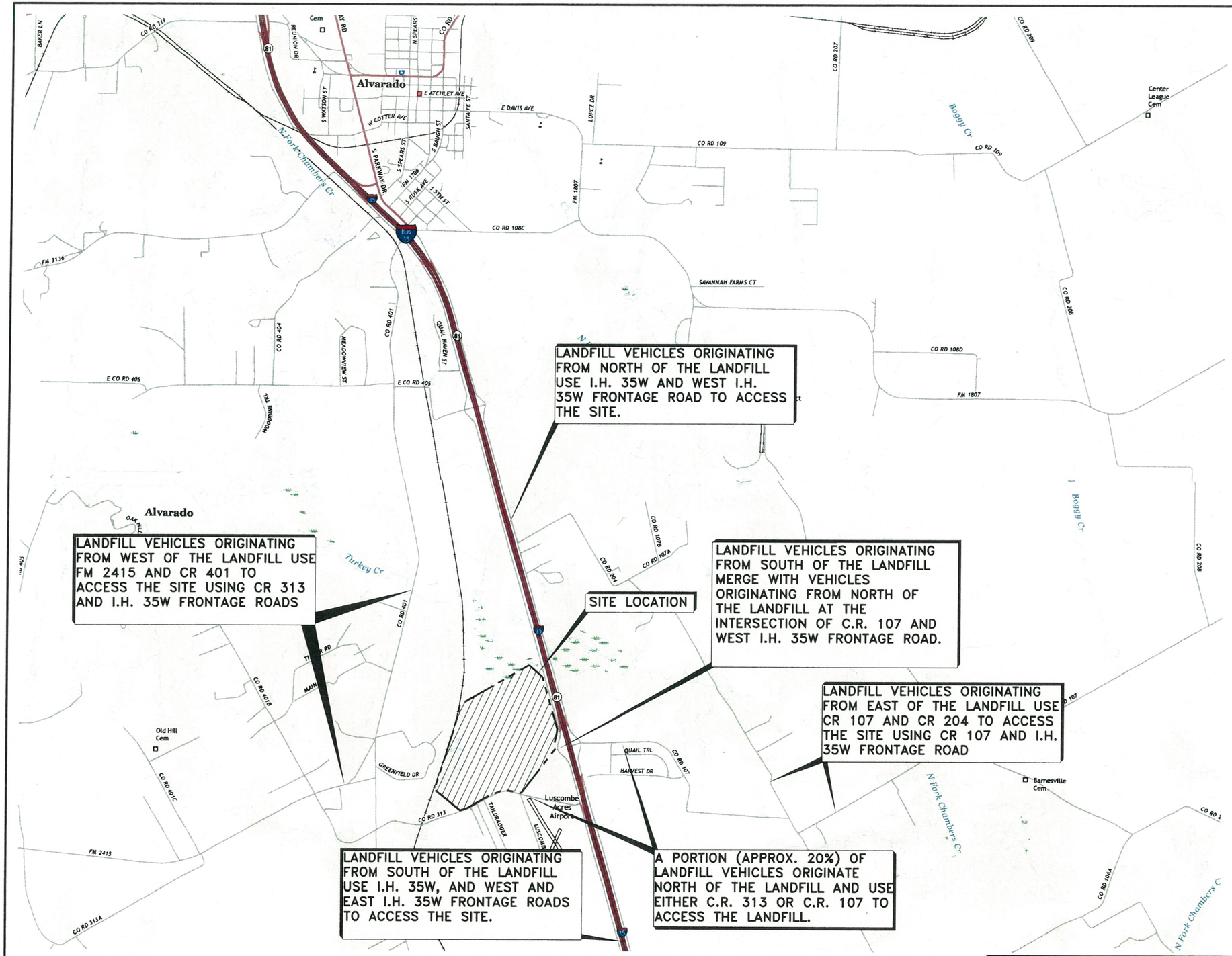
1.1 Purpose

Weaver Consultants Group, LLC is in the process of developing a Major Permit Amendment Application, on behalf of Texas Regional Landfill Company, LP, to authorize the future expansion of the Turkey Creek Landfill. The purpose of this study is to demonstrate that the access roads to the Turkey Creek Landfill (IH-35W, County Roads 313, 107, 204, and 401, and Farm to Market Road 2415) will provide excellent access to the site. The Engineering Study is completed consistent with the requirements listed in 30 TAC §330.61(i), which requires the following information.

- Provide data on the availability and adequacy of roads that the owner or operator will use to access the site;
- Provide data on the volume of vehicular traffic on access roads within one mile of the proposed facility, both existing and expected, during the expected life of the proposed facility;
- Project the volume of traffic expected to be generated by the facility on the access roads within one mile of the proposed facility; and
- Submit documentation of coordination of all designs of proposed public roadway improvements such as turning lanes, storage lanes, etc., associated with site entrances with the agency exercising maintenance responsibility of the public roadway involved. In addition, the owner or operator shall submit documentation of coordination with the Texas Department of Transportation for traffic and location restrictions.

1.2 Summary of Proposed Landfill Expansion

Turkey Creek Landfill is an existing municipal solid waste landfill located in Johnson County, Texas at the northwest corner of the intersection of IH-35W and County Road 313. The current landfill waste disposal unit is approximately 146.5 acres. The proposed permit amendment includes a horizontal and vertical expansion of the existing permitted waste disposal footprint area. The proposed horizontal expansion includes two areas (western and eastern) with a total area of approximately 26.0 acres. The proposed vertical expansion will increase the currently permitted maximum final cover elevation by 50-feet from a current peak elevation of 946 ft-msl to 996 ft-msl. The proposed expansion areas are located entirely within the existing 219.6-acre permit boundary.



STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED
PROFESSIONAL ENGINEER
1-18-22

ALVARADO, TX
2016

GRANDVIEW, TX
2016

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 14S
10 000-foot ticks: Texas Coordinate System of 1983 (north central zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, July 2014
Roads.....U.S. Census Bureau, 2014 - 2015
Names.....GNIS, 2015
Hydrography.....National Hydrography Dataset, 2014
Contours.....National Elevation Dataset, 2004
Boundaries.....Multiple sources; see metadata file 1972 - 2015

Wetlands.....FWS National Wetlands Inventory 1977 - 2014

NOTES:

1. REPRODUCED FROM 2016 USGS 7.5 QUADRANGLES: ALVARADO AND GRANDVIEW.

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TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT SITE LOCATION MAP AND TRAFFIC PATTERNS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1-1

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O:\0771\368\EXPANSION 2021\TRAFFIC\1-1 TxDOT.dwg, jpubr, 1:2

2 TRAFFIC INFORMATION

2.1 Availability and Adequacy of Roads

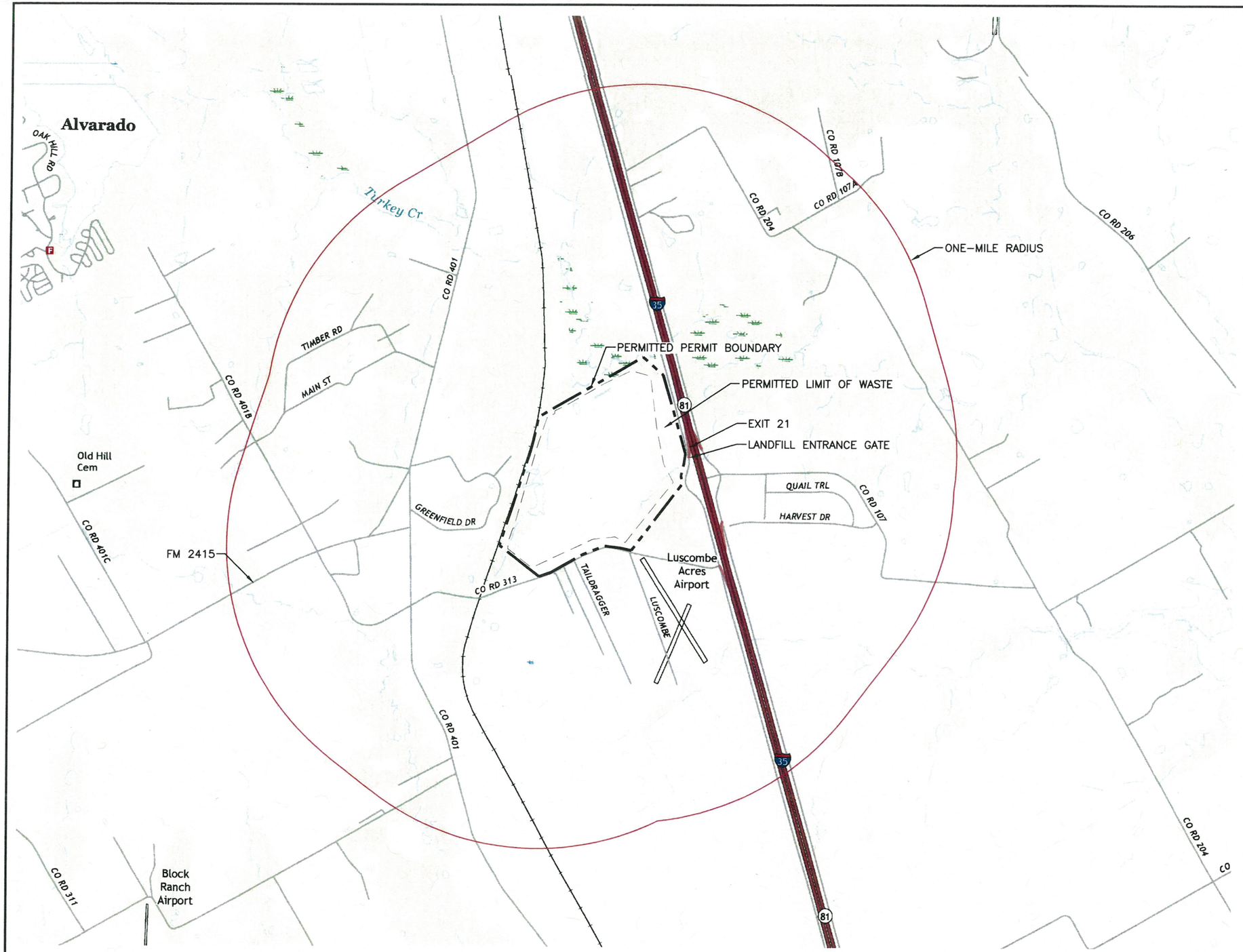
As shown on Figure 2-1, the roads within one mile of the site are IH-35W (multi-lane, divided, 75 mph freeway), IH-35W frontage roads (two-lane, 50 mph asphalt-paved), County Roads (CR) 313, 107, 204, and 401, and Farm to Market (FM) Road 2415 (all are two-lane, asphalt-paved, 30 to 40 mph). IH-35W is the main access road that waste collection vehicles will use to access the site via the western frontage road of IH-35W. Exit 21 allows for direct access to the landfill entrance from IH-35W. The site access roads are IH-35W, CR 401, 107, 204, 313, and FM 2415 as the majority of traffic in- or outbound from the landfill will utilize these roads. Other nearby roads may be periodically used by landfill vehicles to serve residences and businesses located along or near there roadways.

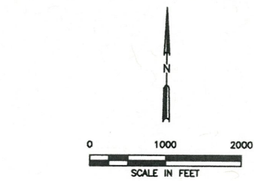
The Turkey Creek Landfill site access road enters the landfill at the southeast corner of the site via Exit 21 from IH-35W. CR 313 and CR 107 both intersect the IH-35W frontage road southeast of the site entrance. IH-35W is a four-lane, divided, controlled access expressway. A secondary site entrance used only intermittently by heavy construction vehicles is on CR 313 on the southside of the site between CR 401 and IH-35W. CR 313, CR 107, CR 204, and CR 401 are two-lane, asphalt-paved county roads. FM 2415 is also a two-lane, asphalt-paved road. Figure 2-2 provides an overview of the site entrances.

The existing entrance to the landfill is shown on Figure 2-3. As shown on Figure 2-3, the site entrance includes an approximately 50-foot-wide concrete road from the western IH-35W frontage road to the scalehouse. The length of the entrance road is approximately 440 feet, which provides a more than ample queuing area for waste vehicles, as noted in Section 2.3.

2.2 Volume of Vehicular Traffic

The volume of vehicle traffic on the site access roads (IH-35W, CR 401, CR 107, CR 204, CR 313, and FM 2415), are summarized on Table 2.1. As noted on Table 2.1, TxDOT traffic counts from 2019 were available for all site access roads. The TxDOT traffic counts were adjusted to 2021 traffic conditions to account of the additional traffic created by area growth between the time volume data was collected and 2021. In summary, all access roads operate at a Level of Service (LOS) of C or better throughout the projected life of the site. Only one road, CR 401, decreases in LOS from 2021 to 2036, and this decrease is only from A to B. All access roads will provide adequate access to the landfill.





LEGEND

- LANDFILL PERMIT BOUNDARY
- LIMITS OF WASTE
- 1 MILE COVERAGE AREA

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
State Route	

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ALVARADO, TX
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Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
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Roads..... U.S. Census Bureau, 2014 - 2015
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Hydrography.....National Hydrography Dataset, 2014
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Boundaries.....Multiple sources; see metadata file 1972 - 2015

Wetlands.....FWS National Wetlands Inventory 1977 - 2014

NOTES:

1. REPRODUCED FROM 2016 USGS 7.5 QUADRANGLES: ALVARADO AND GRANDVIEW.

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REVIEWED BY: CRM

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PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
FACILITY ACCESS ROADS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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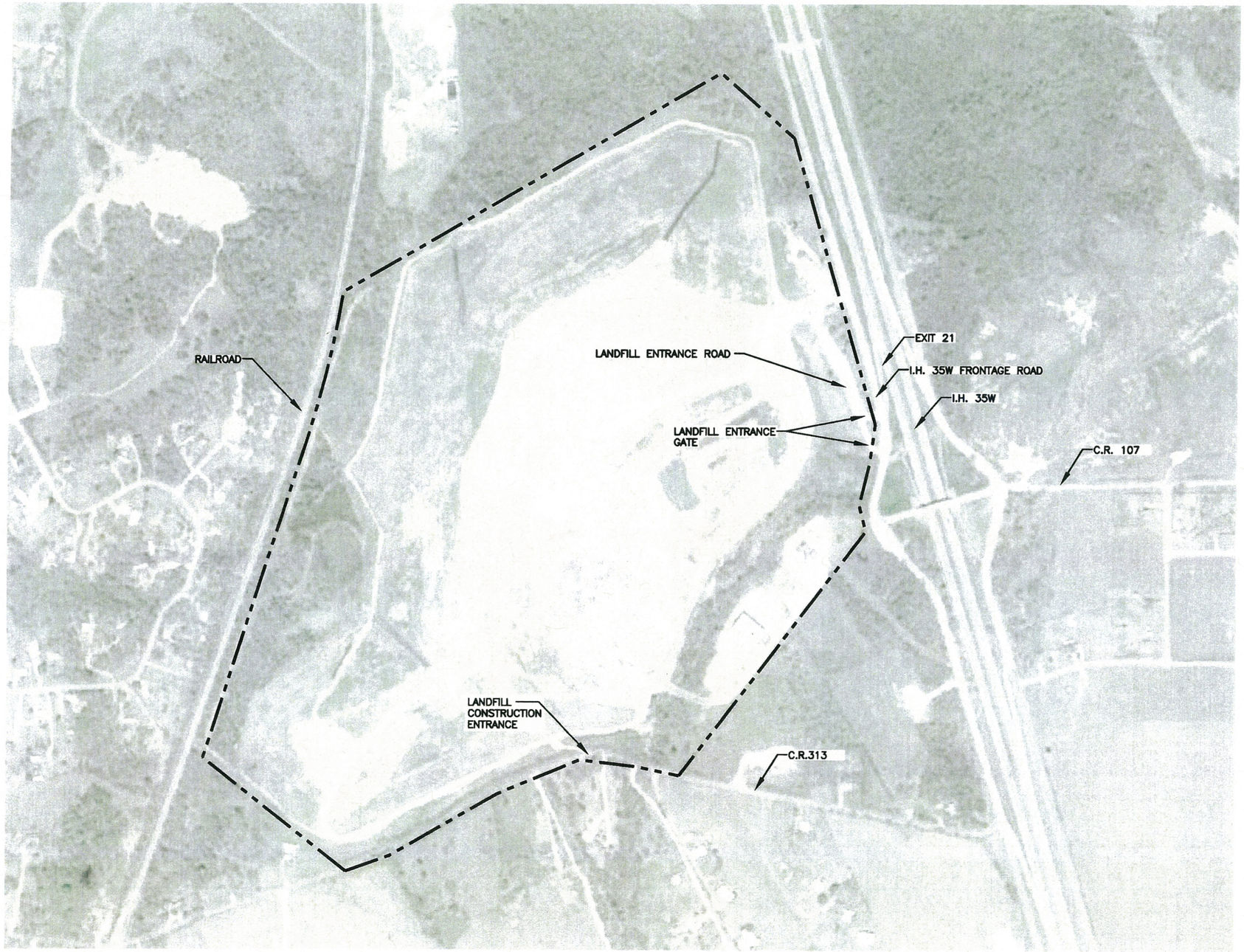
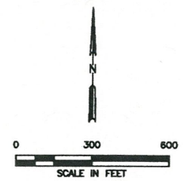
FIGURE 2-1

O:\0771\368\EXPANSION 2021\TRAFFIC\2-1 ACCESS ROAD.dwg, jpuhr, 1:2





LEGEND

LANDFILL PERMIT BOUNDARY



NOTES:

1. AERIAL IMAGERY PROVIDED BY GOOGLE EARTH, DATED MARCH 21, 2018.

0:\0771\38B\EXPANSION 2021\TRAFFIC\2-2 ENTRANCE ROAD.dwg, jpuhr, 1:2

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TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
ENTRANCE ROAD

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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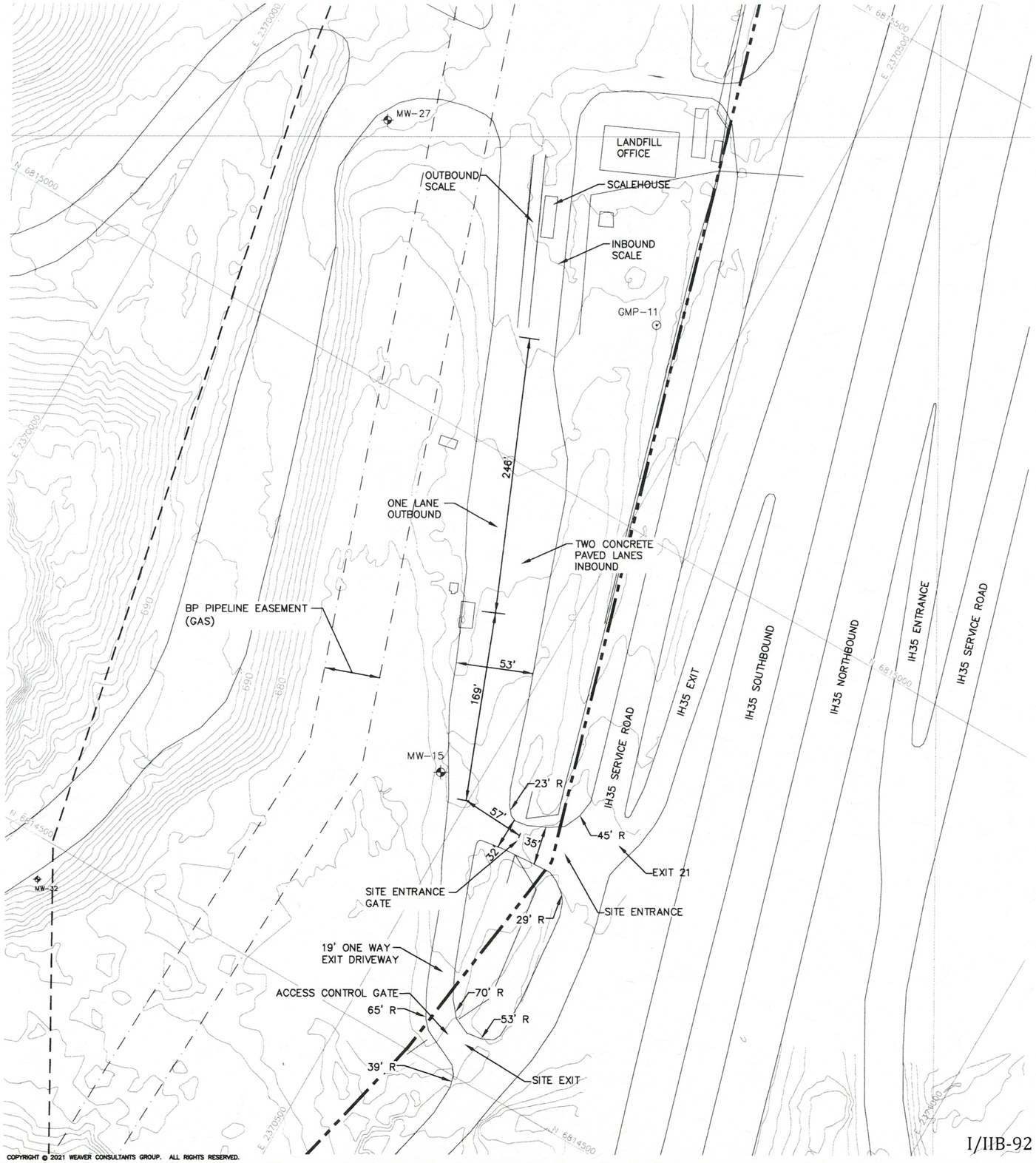
FIGURE 2-2



0 50 100
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- 680 EXISTING CONTOUR
- N 6814500 STATE PLANE COORDINATE
- EASEMENT
- FENCE
- MW-15 EXISTING GROUNDWATER MONITORING WELL

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED PROFESSIONAL ENGINEER
1.18.22

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REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
ENTRANCE FACILITY PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2-3

O:\0771\368\EXPANSION 2021\TRAFFIC\2-3 ENTRANCE FACILITY.dwg, jpuhr, 1:2

TURKEY CREEK LANDFILL
PROPOSED EXPANSION
TRAFFIC STUDY

Table 2.1
2-Way Traffic Volumes

Location	2021 Traffic Conditions[1,2]						Projected 2036 Traffic Conditions[2]					
	Daily			Peak Hour[3]			Daily			Peak Hour[3]		
	Landfill Trips[4]	Non-Landfill Trips	Total	Landfill Trips	Non-Landfill Trips	Total	Landfill Trips[4]	Non-Landfill Trips	Total	Landfill Trips	Non-Landfill Trips	Total
Interstate Highway 35W North of Landfill	1,081	42,896	43,977	108	4,290	4,398	1,327	52,560	53,887	133	5,256	5,389
Interstate Highway 35W South of Landfill	1,081	41,136	42,217	108	4,114	4,222	1,327	50,403	51,730	133	5,040	5,173
County Road 401	1,081	1,407	2,488	108	141	249	1,327	1,722	3,049	133	172	305
County Road 204	108	156	264	11	16	26	133	191	324	13	19	32
County Road 107	108	240	348	11	24	35	133	294	427	13	29	43
County Road 313	108	559	667	11	56	67	133	684	817	13	68	82
Farm to Market Road 2415	1,081	1,465	2,547	108	147	255	1,327	1,794	3,120	133	179	312

Notes:

[1] 2021 Traffic conditions are based on volumes provided on the TxDOT 2019 District Traffic Map. These volumes are projected using population growth rates in the NCTCOG North Central Texas 2030 Demographic Forecast.

[2] The annual population growth rate is 1.36% for 2011-2020, 1.02% for 2021-2030, and 0.93% for 2031-2040.

[3] Peak hour volumes are assumed to be ten percent of the total daily traffic volume.

[4] 2021 Landfill trips were estimated from information provided by the site operator. Projected landfill trips were calculated based on the projected waste inflow rate. The number of inbound trips per day was calculated based on truck capacity, density, ton and the current breakdown of landfill vehicle types. The inbound volume was doubled to obtain the number of total daily two-way landfill trips.

[5] It is conservatively assumed that 100 percent of all landfill traffic will travel IH-35W (north of landfill), IH-35W (south of landfill), CR 401, and FM 2415. Assume 10 percent of landfill traffic will use CR 204, CR 107, and CR 313).

I/IIB-93

24-Hour One-Way Landfill Vehicle Estimates

Vehicle Description	2021 Conditions					2036 Conditions				
	Truck Capacity (yd^3)	Waste Density (lb/yd^3)	Truck Capacity (tons)	Distribution of Waste Stream (tons)	Estimated Vehicle Counts (vehicles/day)	Truck Capacity (yd^3)	Waste Density (lb/yd^3)	Truck Capacity (tons)	Distribution of Waste Stream (tons)	Estimated Vehicle Counts (vehicles/day)
Read Loader	20	500	5.0	720	144	20	500	5.0	883	177
Front Loader	40	500	10.0	825	83	40	500	10.0	1012	101
Rolloffs	30	267	4.0	600	150	30	267	4.0	736	184
Transfer Trailers	125	400	25.0	840	34	125	400	25.0	1031	41
Private	-	-	0.25	15	60	-	-	0.25	18	74
Subtotal:	--	--	--	3,000	470				3,681	577
Facility Personnel/Misc. [1]	--	--	--	--	71	-	-	-	--	87
Total:	--	--	--	**3,000**	**541**				**3,681**	**663**

Notes:

[1] Facility personnel and miscellaneous vehicle count estimates were assume to be approximately 15% of the total vehicles.

Table 2.2
Traffic Impact Assessment[1]

Location	Roadway Capacity (veh/hr)	2021 Traffic Conditions						Projected 2036 Traffic Conditions					
		Total Volume (vpd)	Landfill Vehicles (vpd)	Peak Hour Volume[2] (veh)	% of Roadway Capacity used	LOS[1]	% of Roadway Capacity Used by Landfill Vehicles	Total Volume (vpd)	Landfill Vehicles (vpd)	Peak Hour Volume[2] (veh)	% of Roadway Capacity used	LOS[1]	% of Roadway Capacity Used by Landfill Vehicles
Interstate Highway 35W North of Landfill	6,400	43,977	812	4,398	68.7%	C	1.3%	53,887	1,190	5,389	84.2%	C	1.9%
Interstate Highway 35W South of Landfill	6,400	42,217	812	4,222	66.0%	C	1.3%	51,730	1,190	5,173	80.8%	C	1.9%
County Road 401	3,200	2,488	812	249	7.8%	A	2.5%	3,049	1,190	305	9.5%	B	3.7%
County Road 204	3,200	264	81	26	0.8%	A	0.3%	324	119	32	1.0%	A	0.4%
County Road 107	3,200	348	81	35	1.1%	A	0.3%	427	119	43	1.3%	A	0.4%
County Road 313	3,200	667	81	67	2.1%	A	0.3%	817	119	82	2.6%	A	0.4%
Farm to Market Road 2415	3,200	2,547	812	255	8.0%	B	2.5%	3,120	1,190	312	9.8%	B	3.7%

I/IIB-94

Notes:

[1] Level of Service for Interstate Highway 35W, County Road 401, County Road 107, County Road 204, County Road 313, and Farm to Market Road 2415 is determined based on average travel speed from Reference 1, Chapter 15.

[2] Peak hour volumes are assumed to be ten percent of the total daily traffic volume.

3 COMPLIANCE WITH HIGHWAY BEAUTIFICATION ACT

The Texas Transportation Code (TTC) Chapter 391 outlines compliance conditions and regulations to ensure that areas adjacent to interstate and primary transportation systems in Texas comply with the Highway Beautification Act (HBA), 23 U.S.C. §131, 136, and 319. In the context of the HBA, landfills are classified as junk yards, and no junk yard may be established within 1,000 feet of the right-of-way of a highway in the interstate or primary systems. The rights-of-way of IH-35W and Johnson County Roads 313 and 107 are within 1,000 feet of the permit boundary of the Turkey Creek Landfill. However, based on the definitions set forth in HBA and TTC, it is understood that the landfill will be appropriately screened from the roadway by providing adequate vegetation over the final cover areas and screening trees or bushes as needed. Therefore, the requirements set forth in the HBA would be implemented appropriately at the Turkey Creek Landfill.

The design and operating requirements listed in the Major Permit Amendment Application to the Texas Commission on Environmental Quality (TCEQ) were developed to meet the intent of the screening standards for landfills set forth in the TxDOT Right of Way Manual (Volume 7 – Beautification, Chapter 10 – Control of Junkyards). According to the TxDOT Right of Way Manual, landfills will be considered appropriately screened by:

- Fencing the landfill area;
- Confining the refuse to the smallest practical area;
- Reducing the refuse to the smallest practical volume; and
- Covering the refuse with a layer of earth at the conclusion of each day's operation or at more frequent intervals if necessary.

A summary of each of these requirements is listed in Table 3-1.

Table 3-1
Turkey Creek Landfill Expansion
Landfill Screening Requirements

TxDOT Screening Requirements	Existing and Proposed Site Design or Permit Operating Condition
Fencing the Landfill Area	The Turkey Creek Landfill is currently fenced around the entire permit boundary, and access into the site is restricted to the entrance road in the southeast corner and south access point.
Confining the Refuse to the Smallest Practical Area and Volume	Solid waste at the Turkey Creek Landfill is disposed of at the working face of the landfill. The working face is the only portion of the disposal area containing exposed solid waste. The size of the working face is required to be confined to as small of an area as practical. Specific working face size limitations are included in the existing and proposed Site Operating Plan.
Covering the Refuse with a Layer of Earth at the Conclusion of Each Day's Operation or at More Frequent Intervals in necessary	The Site Operating Plan mandates that at least once every 24 hours, exposed solid waste will be covered by at least six inches of earthen cover material or by TCEQ-approved alternate daily cover material. Additionally, areas that have received daily cover and become inactive for at least 180 days will receive an additional six inches of well-compacted cover material. This intermediate cover will be graded and seeded such that sustainable vegetation is established on these inactive areas. The erosion control plan for the Turkey Creek Landfill outlines inspection and maintenance requirements designed to maintain the vegetation of the intermediate cover.

APPENDIX A

PROJECT SUMMARY AND SITE LOCATION MAPS

Project Summary
Turkey Creek Landfill Expansion
Johnson County, Texas

Introduction

Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain authorization for an expansion of the existing Turkey Creek Landfill. This landfill expansion project will provide long-term disposal capacity for municipal solid waste that is generated in the area. The permit application will be submitted to the Texas Commission on Environmental Quality (TCEQ). The application will undergo a detailed review by the TCEQ before the permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed landfill expansion. The following subsections detail information regarding the owner and operator of the site, general site information, and a summary of the proposed site design.

Owner/Operator Information

The Turkey Creek Landfill is owned and operated by Texas Regional Landfill Company, LP (previously IESI TX Landfill, LP), a subsidiary of Waste Connections, Inc. Waste Connections, Inc. is one of the leading providers of solid waste services in the nation and provides services to residential, municipal and commercial customers across the country.

Site Information

The following drawings are attached to this summary.

- Figure 1 – Site Location Map. This drawing shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This drawing shows the existing permitted landfill permit boundary and the limits of disposal area on a USGS map.
- Figure 3 – Aerial Photograph. This figure details the existing permitted landfill permit boundary and limits of waste disposal area on an aerial photograph.
- Figure 4 – Site Plan. This plan highlights the existing permitted landfill permit boundary and the limits of disposal area on a detailed topographic map.
- Figure 5 – Existing and Proposed Landfill Completion Plan. This Plan provides a comparison between the currently permitted landfill and the proposed changes to the landfill completion plan.

Site History

The Turkey Creek Landfill is an existing 219.6-acre municipal solid waste (MSW) landfill (TCEQ Permit No. MSW-1417C) located approximately 2.5 miles south of the City of Alvarado in Johnson County, Texas. The site was originally permitted as a 91-acre Type I MSW disposal facility in 1983 (Permit No. MSW-1417). A permit amendment (MSW-1417A) was issued in 1988 which did not add acreage, but made more efficient use of the permitted area. The permit was amended in 1991 (Permit No. MSW-1417B). This amendment increased the permit boundary to its currently permitted acreage (219.6 acres). The permit was amended again in 2020 (Permit No. MSW-1417C). This amendment increased the height from 834 feet mean sea level (ft-msl) to 946 ft-msl. The currently permitted waste disposal footprint is approximately 146.4 acres.

Design Summary

The following information presents a summary of the design and operations of the proposed Turkey Creek Landfill expansion.

- The Turkey Creek Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-1417C). The existing landfill currently serves residences and businesses in the communities of Johnson County and nearby counties.
- With this expansion, the existing 219.6-acre permit boundary footprint will not be expanded. The permitted limits of waste will be expanded from approximately 146.4 acres to approximately 172.0 acres. The current peak elevation of 946 feet mean sea level (msl) will be expanded vertically to 996 feet msl.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the Turkey Creek Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes as approved by TCEQ.
- Access to the site will be provided via the existing site access roads. Based on travel patterns of existing landfill traffic, vehicles bound for the landfill will generally access the site using I-35W and the I-35W frontage road. which is capable of handling the loads associated with landfill traffic.
- A liner and final cover system that meets all regulatory requirements will be used for the solid waste containment system. The design objective of the containment system (final cover, liner, and leachate management systems) is to isolate the solid waste and remove leachate (defined as liquid that has contacted solid waste) that may collect on the liner system. Collected leachate will be stored on-site then transferred to an authorized treatment facility, handled on-site in accordance with the liquid stabilization program, or recirculated to areas with composite liners for use as a compaction aid in the working face. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures,

which are performed by a qualified independent licensed professional engineer specialized in landfill construction quality assurance. Each of the containment system components must be thoroughly reviewed and approved by the TCEQ before solid waste is placed in the landfill.

- To control landfill gas (LFG) emissions and minimize the potential for subsurface migration a LFG collection and control system (GCCS) has been installed at the site. The collection system currently consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is conveyed to a nearby plant and converted to energy or conveyed to a LFG flare where it is combusted. The existing LFG system will continued to be expanded to collect LFG from the currently permitted but undeveloped waste fill footprint and the horizontal expansion areas. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control LFG.
- To verify that the highest level of environmental protection is provided, the following landfill monitoring systems are provided:
  - Groundwater Monitoring System. The purpose of the groundwater monitoring system is to verify the integrity of the containment system and verify that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining water samples from the monitor wells located on the perimeter of the landfill, which are screened in the upper most water table. The water samples are tested by an accredited third-party analytical laboratory.
  - LFG Detection System. The purpose of the LFG detection system is to verify that LFG does not migrate off-site. LFG detection probes have been installed along the current permit boundary perimeter.

  Each of these systems are sampled and tested periodically. The results are filed with the TCEQ and are public record.
- Site Operations. The site will be operated by personnel who have been trained and certified by the TCEQ. A detailed site operating plan will be included in the permit amendment application. The plan will detail the required equipment, personnel, and safety procedures required to operate the site in accordance with TCEQ regulations. The active landfill area will be covered at the end of each workday to prevent potential nuisance conditions such as odors and vectors. The Turkey Creek Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.



0 1/2 1
SCALE IN MILES

LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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I/IIB-101

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 1-SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

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PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

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NO.	DATE	DESCRIPTION

SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 1-SITE LOCATION MAP.dwg, jpuhr, 1:2



0 1000 2000
SCALE IN FEET

LEGEND

- PROPERTY/PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
State Route	

ALVARADO, TX
2019

GRANDVIEW, TX
2019

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery	NAIP, September 2016 - November 2016
Roads	U.S. Census Bureau, 2015 - 2018
Names	GNIS, 1979 - 2018
Hydrography	National Hydrography Dataset, 2000 - 2018
Contours	National Elevation Dataset, 2003 - 2004
Boundaries	Multiple sources; see metadata file 2016 - 2017
Wetlands	FWS National Wetlands Inventory 1981

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery	NAIP, September 2016 - November 2016
Roads	U.S. Census Bureau, 2015 - 2018
Names	GNIS, 1979 - 2018
Hydrography	National Hydrography Dataset, 2002 - 2018
Contours	National Elevation Dataset, 2004
Boundaries	Multiple sources; see metadata file 2016 - 2017
Wetlands	FWS National Wetlands Inventory 1981

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DESIGN BY: DEP
REVIEWED BY: CRM

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

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GENERAL TOPOGRAPHIC MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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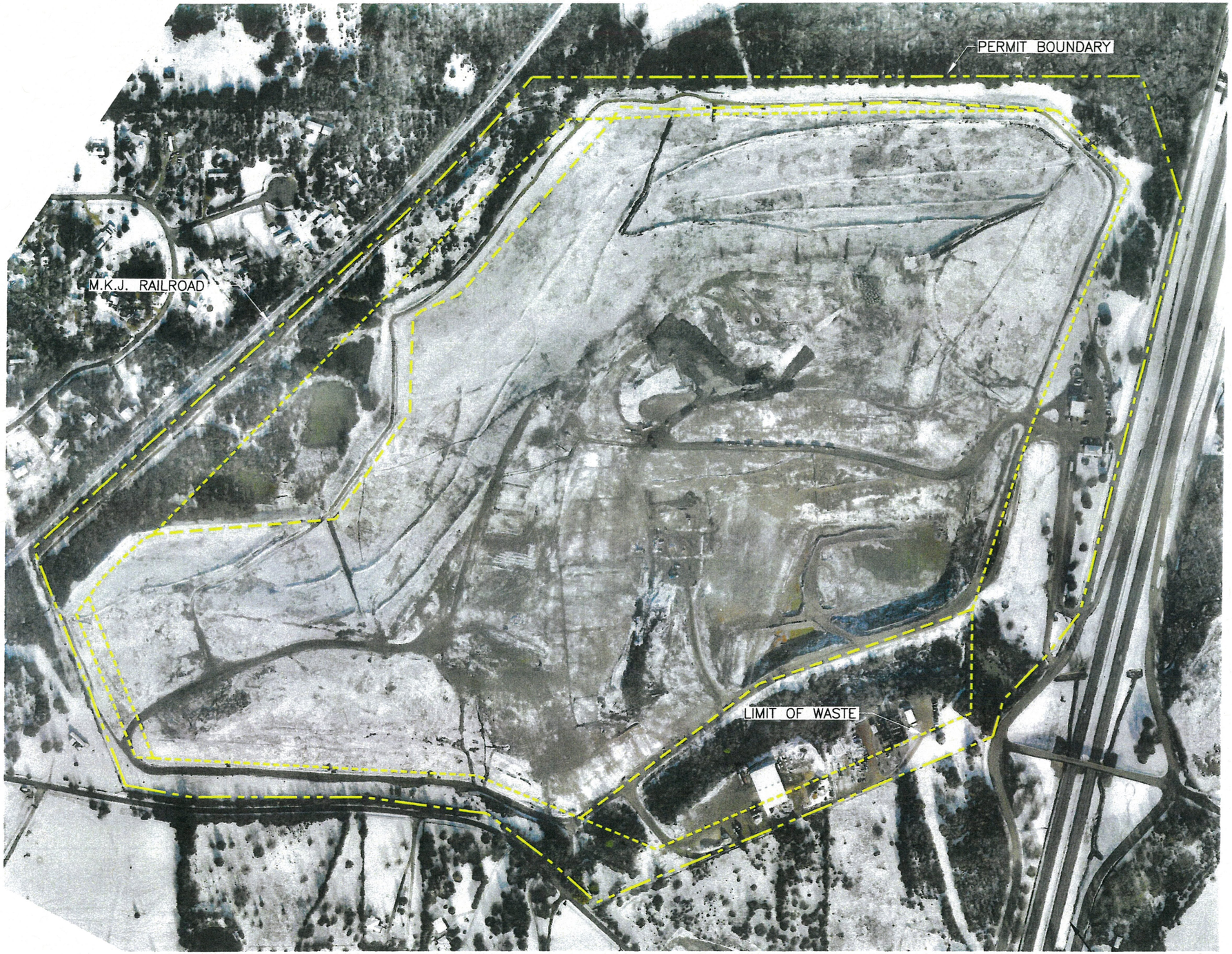
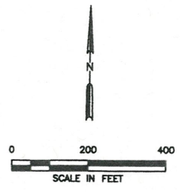
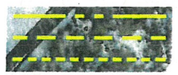
FIGURE 2

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 2-GENERAL TOPO MAP.dwg, jpuhr, 1:2





LEGEND



PROPERTY/PERMIT BOUNDARY
PERMITTED LIMITS OF WASTE
PROPOSED LIMITS OF WASTE

NOTES:

1. AERIAL IMAGERY PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

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DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

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AERIAL PHOTOGRAPH

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 3

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O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 3-AERIAL PHOTOGRAPH.dwg, jwilson, 1:2



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- SECTOR BOUNDARY
- MW-7 — PERMITTED GROUNDWATER MONITORING WELL
- GMP-12 — PERMITTED GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DESIGN BY: MB
REVIEWED BY: CRM

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SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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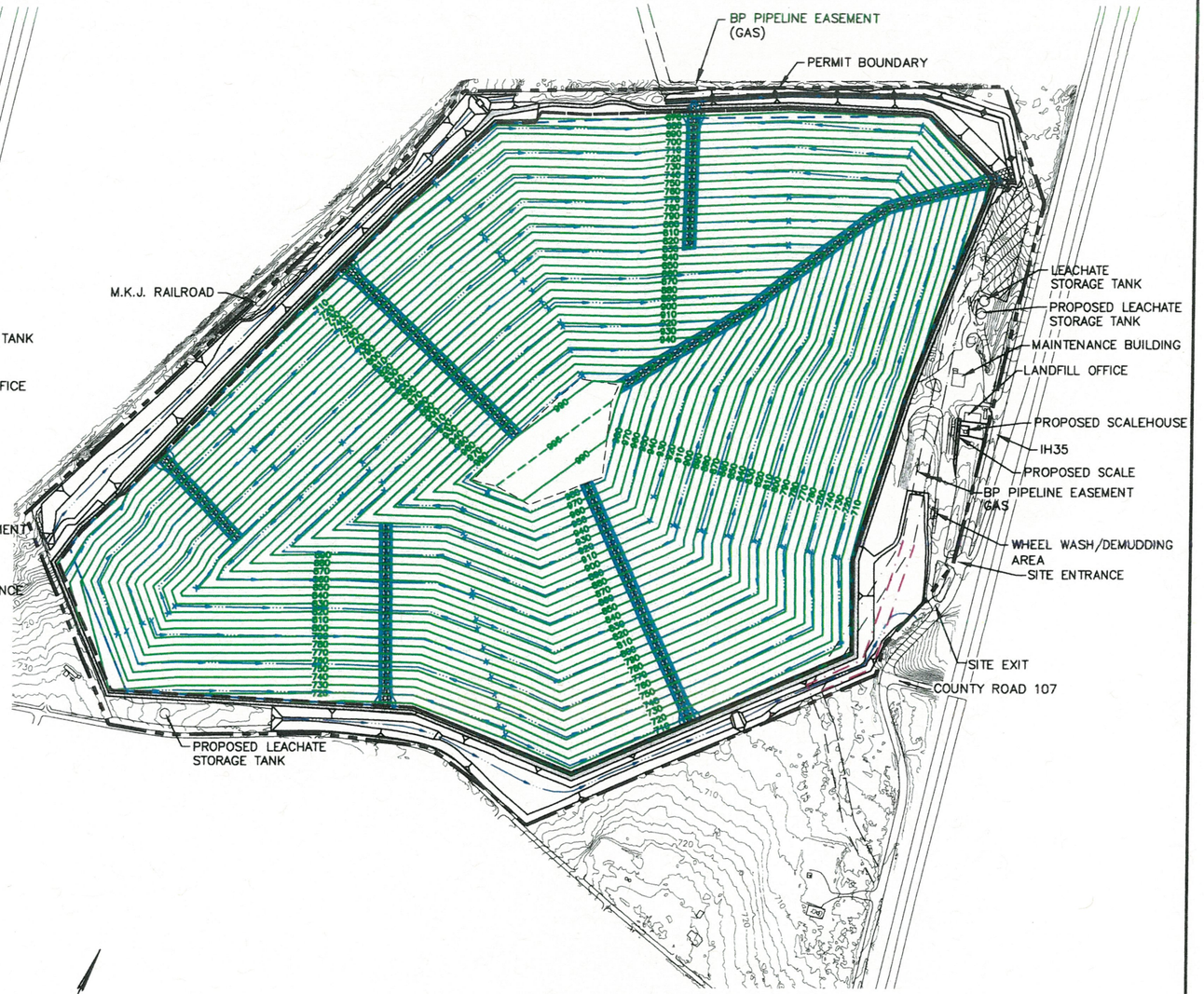
FIGURE 4

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 4-SITE PLAN.dwg, jwilson, 1:2



PERMITTED LANDFILL COMPLETION PLAN



PROPOSED LANDFILL COMPLETION PLAN

0 300 600
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
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DRAWN BY: RAA
DESIGN BY: MB
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EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 5

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 5-LANDFILL COMPLETION PLAN.dwg, jwilson, 1:2

TCEQ TRANSPORTATION DATA AND COORDINATION REPORT FORM FOR MSW TYPE I LANDFILLS (TCEQ – 20719, 09/27/21)

Texas Commission on Environmental Quality

Transportation Data and Coordination Report Form for Municipal Solid Waste Type I Landfills

This form is for use by applicants or site operators of Municipal Solid Waste (MSW) Type I landfills to provide data and information to address the availability and adequacy of access roads to a landfill site, the volume of vehicular traffic on and generated by the facility on area roadways, and to provide coordination information as required under 30 TAC §330.61(i). Roadways that provide primary access to a landfill facility must be adequate and possess appropriate design capacity to safely accommodate the additional volumes and weights of traffic generated or expected to be generated by this landfill facility during its active life. Data provided in this form should correspond with data contained in the coordination documents submitted to the Texas Department of Transportation or other agency that has jurisdiction over affected area roads.

If you need assistance in completing this form, please contact the Municipal Solid Waste Permits Section of the Waste Permits Division at (512) 239-2335.

I. General Information

Facility Name: **Turkey Creek Landfill**

MSW Permit No.: **1417D**

Site Operator/Permittee Name and Mailing Address: **Texas Regional Landfill Company, LP**
3 Waterway Square Place, Suite 550, The Woodlands, Texas 77380

II. Documentation of Coordination with the Texas Department of Transportation (TXDOT) for Traffic and Location Restrictions

1. A traffic study document and cover letter was submitted to TXDOT as Coordination for traffic and location restrictions for the subject facility and a copy of the documents submitted to TXDOT is attached herein: ☒ Yes ☐ No

   If you checked "No" , provide explanation:

2. Date of submission of the coordination documents to TXDOT:

3. TXDOT's response received? ☒ Yes ☐ No

4. If "No" is checked in response to Item I.3 above, complete Items I.4 and I.5 below only after TxDOT's response is received.

5. Did TxDOT's response include recommendation of improvements to any of the roadways or intersections that lead to the site? ☐ Yes ☒ No

6. If you checked "Yes" in Item I.5 above, proceed to Section III., TxDOT's Recommended Roadway or Intersection Improvements (as applicable).

7. If you checked "No" in Item I.5 above, provide TxDOT's response to the traffic and location restrictions compliance coordination for the subject site: *(Enter TxDOT's response to coordination correspondence)* **(Refer to Page I/IIB-____)**

III. TxDOT Recommended Roadway or Intersection Improvements (as applicable)

Enter TxDOT's recommendations for improvement of roadways or intersections that lead to the site:

1.

2.

3.

IV. Documentation of Coordination of Improvement Designs of Public Roadways (turning lanes, storage lanes, acceleration/deceleration lanes, etc.) at and Near the Site Entrances with Agencies that Exercise Maintenance Responsibility

1. Complete Table 1 with information regarding documentation of coordination of improvement designs for existing and proposed roads.

Table 1: Public Roadway Improvements Coordination

Existing and Proposed Roads Associated with the Site Entrance(s)	Agency Exercising Maintenance Responsibility	Date of Coordination Correspondence from the Applicant or Site Operator to the Agency Responsible	Date of the Coordination Response Letter from the Agency Responsible	Did the Agency Responsible Require Improvements to the Roadway(s) Associated with the Site Entrance(s) (check Yes or No as applicable)
I-35W	TXDOT	01-18-2022		☐Yes ☒No
I-35W Frontage Road	TXDOT	01-18-2022		☐Yes ☒No
County Road 401	TXDOT	01-18-2022		☐Yes ☒No
County Road 107	TXDOT	01-18-2022		☐Yes ☒No

Existing and Proposed Roads Associated with the Site Entrance(s)	Agency Exercising Maintenance Responsibility	Date of Coordination Correspondence from the Applicant or Site Operator to the Agency Responsible	Date of the Coordination Response Letter from the Agency Responsible	Did the Agency Responsible Require Improvements to the Roadway(s) Associated with the Site Entrance(s) (check Yes or No as applicable)
County Road 204	TXDOT	01-18-2022		☐Yes ☒No
County Road 313	TXDOT	01-18-2022		☐Yes ☒No
FM 2415	TXDOT	01-18-2022		☐Yes ☒No

2. If you checked "Yes" in the last column of Table 1, indicating that improvements are required, address the following:

   (a) Briefly describe the improvements proposed for the public roadway(s) associated with the site entrance(s):

   (b) A copy of the proposed improvement design submitted to the agency exercising maintenance responsibility over the roadway is attached herein: ☐Yes ☐No. If you checked "No" please explain:

   (c) A copy of the response letter from the agency exercising maintenance responsibility over the roadway(s) associated with the site entrance(s) approving the improvement design is attached herein: ☐Yes ☐No. If you checked "No" please explain:

V. Facility Location and Operation Information Used in Estimating Transportation Data

1. Facility Location Information

   The facility is located near the intersection of Interstate Highway 35W and Johnson County Road 107. The facility is accessed from IH-35W exit 21 toward CR 107, and the entrance is located on the northwest quadrant of the intersection.

2. Waste Acceptance Rates

   (a) Initial Waste Acceptance Rate: **858,000 tons per year (2021)**

(b) Estimated Maximum Waste Acceptance Rate at any Time During Facility Life: **1,052,795 tons per year (2036)**

3. Hours of Operation and Site Life

(a) a. Operating Hours: 24 hours per day and 7 days per week

(b) b. Waste Acceptance Hours: 24 hours per day and 7 days per week

(c) c. Estimated Site Life: 15 years

4. Other Information Used or Assumed in Estimating Transportation Data: Historical waste acceptance rate and projected population growth for the service area.

VI. Facility Daily Traffic Volume Data

1. Complete Table 2 with estimated existing daily volume of traffic generated by the facility.

Table 2: Estimated Existing Daily Volume of Traffic Generated

Vehicle Type	Traffic Volume to Facility (vehicles per day, vpd)	Traffic Volume from Facility (vpd)
Trucks	470	470
Employee Vehicles	63	63
Visitors Vehicles	8	8
Other Vehicles		
Summation of Daily Volume of Traffic to and from the Facility		
Total Daily Volume of Traffic	541	541

(a) Describe the source(s) of or method(s) used to obtain the existing daily volume of traffic generated by the facility: **Facility-provided vehicle count information**

(b) Location(s) of traffic counts (if applicable): **Scalehouse**

2. Complete Table 3 with estimated future daily volume of traffic generated by the facility.

Table 3: Estimated Future Daily Volume of Traffic Generated

Vehicle Type	Traffic Volume to Facility (vpd)	Traffic Volume from Facility (vpd)
Trucks	577	577
Employee Vehicles	78	78
Visitors Vehicles	9	9
Other Vehicles		
Summation of Daily Volume of Traffic to and from the Facility		
Total Daily Volume of Traffic	663	663

3. Describe the method(s) used to obtain the estimated future daily volume of traffic generated by the facility, including dates, traffic growth rates, and sources of the growth rates: **Based on the projected future waste acceptance rate.**

4. Maps showing the facility boundary and roads within 1 mile of the facility that provide access to the site are attached herein. Yes ☒ No☐. If you checked "No" please explain: **Figure 2-1 in Appendix I/IID – Traffic Study**

VII. Availability and Adequacy of Roads

1. Complete Table 4 with information regarding the primary access roadways.

Table 4: Roadway Characteristics of the Primary Access Roadways

List the roads that the owner or operator will use as primary access to the site	Existing Annual Average Daily Traffic on Roadway (vpd)	Expected Annual Average Daily Traffic on Roadway (vpd)	Existing Roadway Capacity	Expected Roadway Capacity	Max Gross Weight Allowed (lbs)	Max/Min Posted Speed Limit (mph)	Min Vertical Clearance (ft)	Surface Type and No. of Lanes	Level of Service	Existing Traffic Generated by the Facility on Each Roadway	Expected Traffic Generated by the Facility on Each Roadway
IH-35W N	43,977	53,887	6,400	6,400	80,000	70	14	Asphalt-2	C	1,081	1,327
I-35W S	42,217	51,730	6,400	6,400	80,000	70	14	Asphalt-2	C	1,081	1,327
CR 104	2,488	3,049	3,200	3,200	80,000	40	14	Asphalt-2	B	1,081	1,327
CR 107	264	324	3,200	3,200	80,000	40	14	Asphalt-2	A	108	133
CR 204	348	427	3,200	3,200	80,000	40	14	Asphalt-2	A	108	133
CR 313	667	817	3,200	3,200	80,000	40	14	Asphalt-2	A	108	133
FM 2415	2,547	3,120	3,200	3,200	80,000	40	14	Asphalt-2	B	1,081	1,327

2. Complete Table 5 with information regarding other access roadways within one mile.

Table 5: Roadway Characteristics of Other Access Roadways within One Mile of the Facility Boundary

List other access roadways within 1 mile of the facility	Existing Annual Average Daily Traffic on Roadway	Expected Annual Average Daily Traffic on Roadway	Existing Roadway Capacity	Expected Roadway Capacity	Max Gross Weight Allowed (lbs)	Max/Min Posted Speed Limit (mph)	Min Vertical Clearance (ft)	Surface Type and No. of Lanes	Level of Service	Existing Traffic Generated by the Facility on Each Roadway	Expected Traffic Generated by the Facility on Each Roadway
N/A											

3. Complete Table 6 with information regarding access roadway intersections within one mile.

Table 6: Roadway Intersection Characteristics

Please list major (signalized) roadway intersections for access roads within 1 mile of facility	Existing Capacity	Existing Level of Service
N/A for Landfill traffic		

4. (For applicants that conducted traffic counts) Peak period traffic counts were conducted at critical intersections and roadways in the area: ☐ Yes ☒ No

If "No" is checked, please explain: Main access road traffic counts available from TXDOT/NTCOG. Landfill traffic count is available from the operator as each vehicle using the facility must report to the scalehouse.

VIII. Conclusions on the availability and adequacy of roads to be used for accessing the facility

Enter conclusions regarding the availability and adequacy of roads to be used for accessing the facility using information obtained from access roadway data; data on the volume of existing and expected vehicular traffic on the access roads within one mile of the facility; and the projection of the volume of traffic expected to be generated by the facility on the access roads:

The engineering study included in Appendix I/IID, as reviewed and approved by TXDOT, concludes that the public roads provide adequate access to the landfill.

IX. Highway Beautification

Enter facility distance from interstate or primary highways and screening information as required by 30 TAC 330.23(a).

1. Distance of Facility from Interstate or Primary Highway: Adjacent to IH-35W service road.

2. Type of Facility Screening Provided, if applicable: Fencing, Existing Vegetation

X. Analysis of the Impact of the Facility upon Airports

Enter the Part, Appendix, Attachment, Section, and Page Number of the application where analysis of the impact of the facility upon airports is provided: Appendix I/IIB-2 through I/IIB-49.

XI. Documentation of Coordination with the Federal Aviation Administration for Compliance with Airport Location Restrictions

1. Applicant has submitted written information to FAA describing the facility location, maximum height of waste units, type of waste accepted at the facility, and other facility-relevant data and information as required: ☒ Yes ☐ No

   (a) Enter Date of Coordination Letter to FAA: 01-18-2022

   (b) Enter Date of FAA Response: 01-18-2022

2. Indicate FAA Response and Final Action:

   ☒ FAA Acknowledged No Adverse Impact.

   ☐ FAA Recommended Safety Improvements. (*Complete Section XII if you check this item.*)

3. A copy of the Documentation of Coordination with FAA for compliance with airport location restrictions is attached herein. ☒Yes ☐No. If you checked "No" please explain:

   N/A

XII. FAA Recommended Changes or Improvements for Airport Safety, (as applicable)

Enter FAA's recommended changes or improvements to the facility for airport safety or for compliance with airport location restrictions.

N/A

XIII. Attachments

- Maps showing the facility boundary and roads within 1 mile of the facility. **(Refer to Appendix I/IID – Figure 2-1)**
- Documentation of coordination of all designs of proposed public roadway improvements associated with site entrances with the agency exercising maintenance responsibility of the public roadway involved; and the response letter received from the agency, as applicable. **(Refer to Appendix I/IID and TXDOT coordination in I/IIB)**
- Documentation of coordination with the Texas Department of Transportation (TxDOT) for traffic and location restrictions, including any traffic study report; and the response letter received from TxDOT. **(Refer to Appendix I/IID and TXDOT coordination in I/IIB)**
- Documentation of coordination with the Federal Aviation Administration for compliance with airport location restrictions; and the response letter received from FAA. **(Refer to FAA coordination in Appendix I/IIB)**
- Other documents attached: **N/A**

COORDINATION WITH
TEXAS PARKS AND WILDLIFE DEPARTMENT

- TPWD response will be submitted to TCEQ when and if received.
- January 18, 2022 WCG Request for Review Letter.

[TPWD RESPONSE LETTER TO BE INCDLUED]

Weaver Consultants Group

January 18, 2022
Project No. 0771-368-11-123

Ms. Julie Wicker
Wildlife Habitat Assessment Program
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

Re: Endangered or Threatened Species Assessment
Proposed Turkey Creek Landfill Major Permit Amendment
Johnson County, Texas

Dear Ms. Wicker:

The purpose of this letter is to demonstrate coordination with the Texas Parks and Wildlife Department, consistent with Title 30 Texas Administrative Code (TAC) §330.61(n)(2). This regulation requires that a permit applicant for an expansion of a municipal solid waste facility coordinate with the Texas Parks and Wildlife Department regarding compliance with the Endangered Species Act.

Weaver Consultants Group, LLC (WCG) is preparing a permit amendment application, on behalf of Texas Regional Landfill Company, LP, to vertically expand the existing municipal solid waste landfill located approximately 2.5 miles south of Alvarado, Texas. The expansion will be limited to a vertical increase in the height of the landfill and will not change the permit boundary or limits of waste disposal included in the current Texas Commission on Environmental Quality (TCEQ) permit. To assist you in your determination regarding threatened or endangered species or their critical habitat within or near the referenced project, please find attached (1) a project summary and site location maps and (2) a site-specific Biological Assessment Report completed by WCG in August 2018.

The site has operated as a landfill for over 35 years, and a significant portion of the area within the landfill footprint boundary has been disturbed by earth-moving activities (e.g., landfill operation, soil borrow area operations, etc.). A site specific Threatened and Endangered Species Review was completed in August by WCG. As discussed in the attached review, the site does not provide habitat for and would not likely be occupied by any federally listed and state listed threatened and endangered species. The report notes that, while it is possible that the migratory bird species may utilize the site during migration, use would be transitory in nature and of short duration. Lack of suitable habitat makes the occurrence of the migratory species highly unlikely.

6420 Southwest Boulevard ◦ Suite 206 ◦ Fort Worth, Texas ◦ 76109 ◦ wcgrp.com ◦ Offices Nationwide

To verify compliance with Title 30 TAC §330.61(n)(2), we will need to include a review letter from the Texas Parks and Wildlife Department within the permit application. As discussed in the attached WCG report, the site is not likely to be occupied by any federal or state-listed species. Therefore, it is requested that the Texas Parks and Wildlife Department concur with the conclusions made in the attached report.

Your assistance with this matter is sincerely appreciated. Please call if you have any questions or need additional information.

Sincerely,
Weaver Consultants Group, LLC

Charles R. Marsh, P.E.
Project Director

Attachment: Attachment 1 – Project Summary and Site Location Maps
Attachment 2 – Biological Assessment Report

cc: Gary Bartels, Texas Regional Landfill Company, LP

ATTACHMENT 1

PROJECT SUMMARY AND SITE LOCATION MAPS

Project Summary
Turkey Creek Landfill Expansion
Johnson County, Texas

Introduction

Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain authorization for an expansion of the existing Turkey Creek Landfill. This landfill expansion project will provide long-term disposal capacity for municipal solid waste that is generated in the area. The permit application will be submitted to the Texas Commission on Environmental Quality (TCEQ). The application will undergo a detailed review by the TCEQ before the permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed landfill expansion. The following subsections detail information regarding the owner and operator of the site, general site information, and a summary of the proposed site design.

Owner/Operator Information

The Turkey Creek Landfill is owned and operated by Texas Regional Landfill Company, LP (previously IESI TX Landfill, LP), a subsidiary of Waste Connections, Inc. Waste Connections, Inc. is one of the leading providers of solid waste services in the nation and provides services to residential, municipal and commercial customers across the country.

Site Information

The following drawings are attached to this summary.

- Figure 1 – Site Location Map. This drawing shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This drawing shows the existing permitted landfill permit boundary and the limits of disposal area on a USGS map.
- Figure 3 – Aerial Photograph. This figure details the existing permitted landfill permit boundary and limits of waste disposal area on an aerial photograph.
- Figure 4 – Site Plan. This plan highlights the existing permitted landfill permit boundary and the limits of disposal area on a detailed topographic map.
- Figure 5 – Existing and Proposed Landfill Completion Plan. This Plan provides a comparison between the currently permitted landfill and the proposed changes to the landfill completion plan.

Site History

The Turkey Creek Landfill is an existing 219.6-acre municipal solid waste (MSW) landfill (TCEQ Permit No. MSW-1417C) located approximately 2.5 miles south of the City of Alvarado in Johnson County, Texas. The site was originally permitted as a 91-acre Type I MSW disposal facility in 1983 (Permit No. MSW-1417). A permit amendment (MSW-1417A) was issued in 1988 which did not add acreage, but made more efficient use of the permitted area. The permit was amended in 1991 (Permit No. MSW-1417B). This amendment increased the permit boundary to its currently permitted acreage (219.6 acres). The permit was amended again in 2020 (Permit No. MSW-1417C). This amendment increased the height from 834 feet mean sea level (ft-msl) to 946 ft-msl. The currently permitted waste disposal footprint is approximately 146.4 acres.

Design Summary

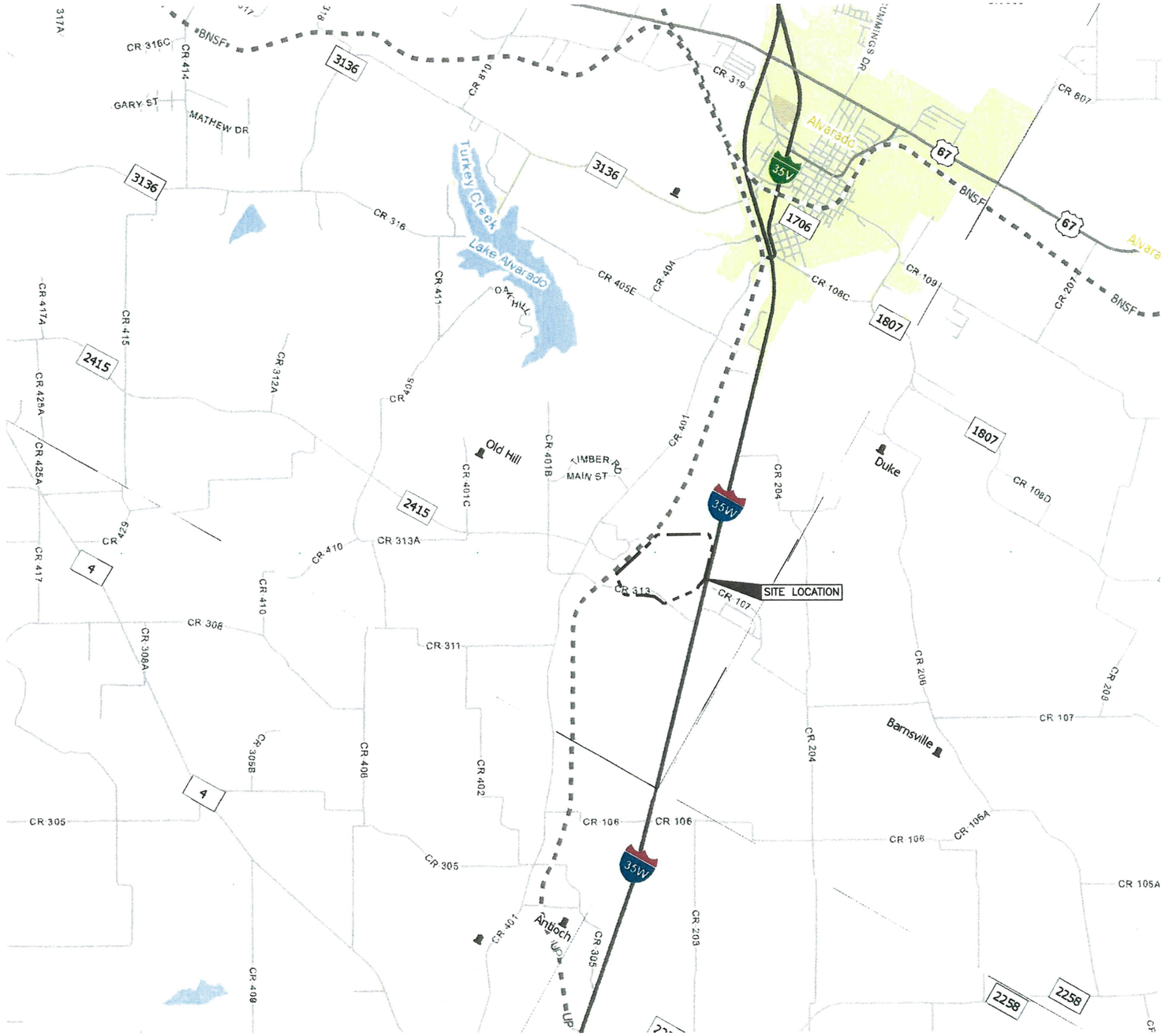
The following information presents a summary of the design and operations of the proposed Turkey Creek Landfill expansion.

- The Turkey Creek Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-1417C). The existing landfill currently serves residences and businesses in the communities of Johnson County and nearby counties.
- With this expansion, the existing 219.6-acre permit boundary footprint will not be expanded. The permitted limits of waste will be expanded from approximately 146.4 acres to approximately 172.0 acres. The current peak elevation of 946 feet mean sea level (msl) will be expanded vertically to 996 feet msl.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the Turkey Creek Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes as approved by TCEQ.
- Access to the site will be provided via the existing site access roads. Based on travel patterns of existing landfill traffic, vehicles bound for the landfill will generally access the site using I-35W and the I-35W frontage road. which is capable of handling the loads associated with landfill traffic.
- A liner and final cover system that meets all regulatory requirements will be used for the solid waste containment system. The design objective of the containment system (final cover, liner, and leachate management systems) is to isolate the solid waste and remove leachate (defined as liquid that has contacted solid waste) that may collect on the liner system. Collected leachate will be stored on-site then transferred to an authorized treatment facility, handled on-site in accordance with the liquid stabilization program, or recirculated to areas with composite liners for use as a compaction aid in the working face. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures,

liner and cover systems follow strict TCEQ-approved quality control procedures, which are performed by a qualified independent licensed professional engineer specialized in landfill construction quality assurance. Each of the containment system components must be thoroughly reviewed and approved by the TCEQ before solid waste is placed in the landfill.

- To control landfill gas (LFG) emissions and minimize the potential for subsurface migration a LFG collection and control system (GCCS) has been installed at the site. The collection system currently consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is conveyed to a nearby plant and converted to energy or conveyed to a LFG flare where it is combusted. The existing LFG system will continued to be expanded to collect LFG from the currently permitted but undeveloped waste fill footprint and the horizontal expansion areas. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control LFG.
- To verify that the highest level of environmental protection is provided, the following landfill monitoring systems are provided:
  - Groundwater Monitoring System. The purpose of the groundwater monitoring system is to verify the integrity of the containment system and verify that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining water samples from the monitor wells located on the perimeter of the landfill, which are screened in the upper most water table. The water samples are tested by an accredited third-party analytical laboratory.
  - LFG Detection System. The purpose of the LFG detection system is to verify that LFG does not migrate off-site. LFG detection probes have been installed along the current permit boundary perimeter.

  Each of these systems are sampled and tested periodically. The results are filed with the TCEQ and are public record.
- Site Operations. The site will be operated by personnel who have been trained and certified by the TCEQ. A detailed site operating plan will be included in the permit amendment application. The plan will detail the required equipment, personnel, and safety procedures required to operate the site in accordance with TCEQ regulations. The active landfill area will be covered at the end of each workday to prevent potential nuisance conditions such as odors and vectors. The Turkey Creek Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.



0 1/2 1
SCALE IN MILES

LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 1-SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1

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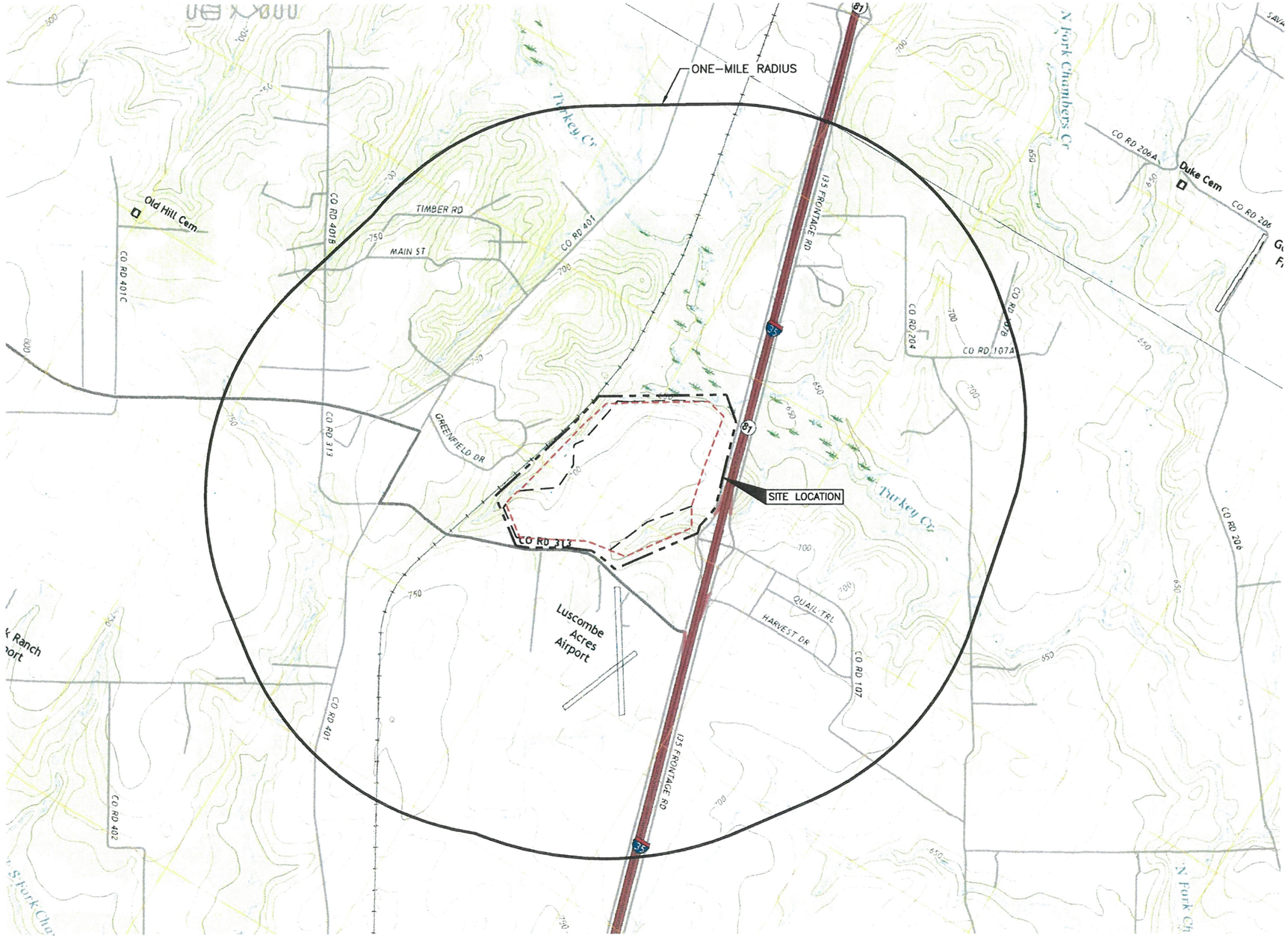
O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 1-SITE LOCATION MAP.dwg, jpuhr, 1:2



0 1000 2000
SCALE IN FEET

LEGEND

- PROPERTY/PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
State Route	

ALVARADO, TX
2019

GRANDVIEW, TX
2019

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery	NAIP, September 2016 - November 2016
Roads	U.S. Census Bureau, 2015 - 2018
Names	GNIS, 1979 - 2018
Hydrography	National Hydrography Dataset, 2000 - 2018
Contours	National Elevation Dataset, 2003 - 2004
Boundaries	Multiple sources; see metadata file 2016 - 2017
Wetlands	FWS National Wetlands Inventory 1981

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery	NAIP, September 2016 - November 2016
Roads	U.S. Census Bureau, 2015 - 2018
Names	GNIS, 1979 - 2018
Hydrography	National Hydrography Dataset, 2002 - 2018
Contours	National Elevation Dataset, 2004
Boundaries	Multiple sources; see metadata file 2016 - 2017
Wetlands	FWS National Wetlands Inventory 1981

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DATE: 12/2021
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CAD: FIG 2-GENERAL TOPO MAP.DWG

DRAWN BY: SRF
DESIGN BY: DEP
REVIEWED BY: CRM

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PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

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NO.	DATE	DESCRIPTION

GENERAL TOPOGRAPHIC MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2

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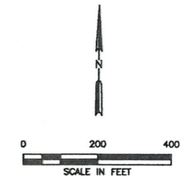
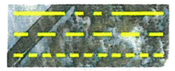
O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 2-GENERAL TOPO MAP.dwg, jpuhr, 1:2





LEGEND



PROPERTY/PERMIT BOUNDARY
PERMITTED LIMITS OF WASTE
PROPOSED LIMITS OF WASTE

NOTES:

1. AERIAL IMAGERY PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 3-AERIAL PHOTOGRAPH.dwg, jpthr, 1:2

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

AERIAL PHOTOGRAPH

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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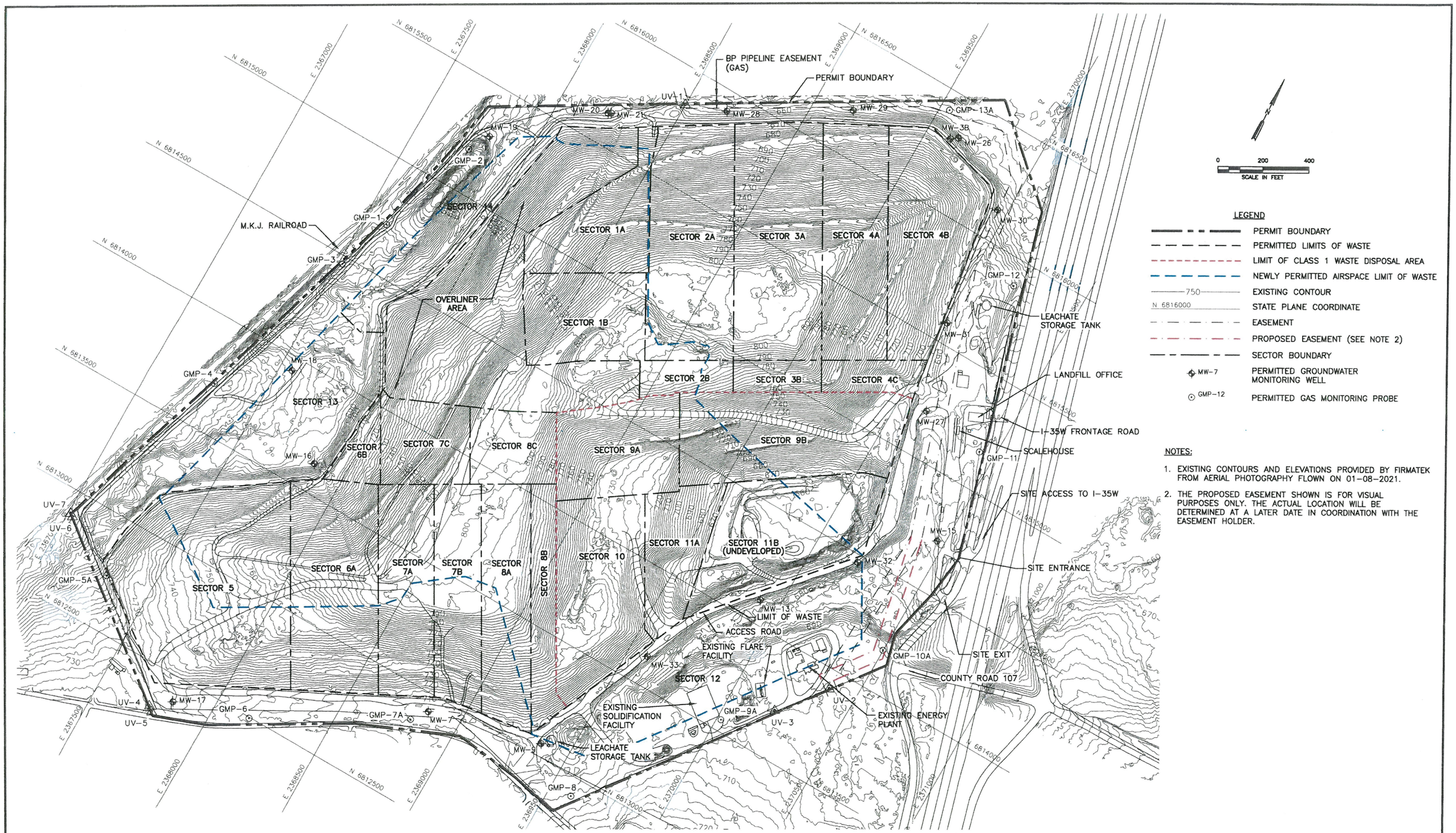
FIGURE 3



NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DATE: 12/2021
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DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
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REVISIONS		
NO.	DATE	DESCRIPTION

SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

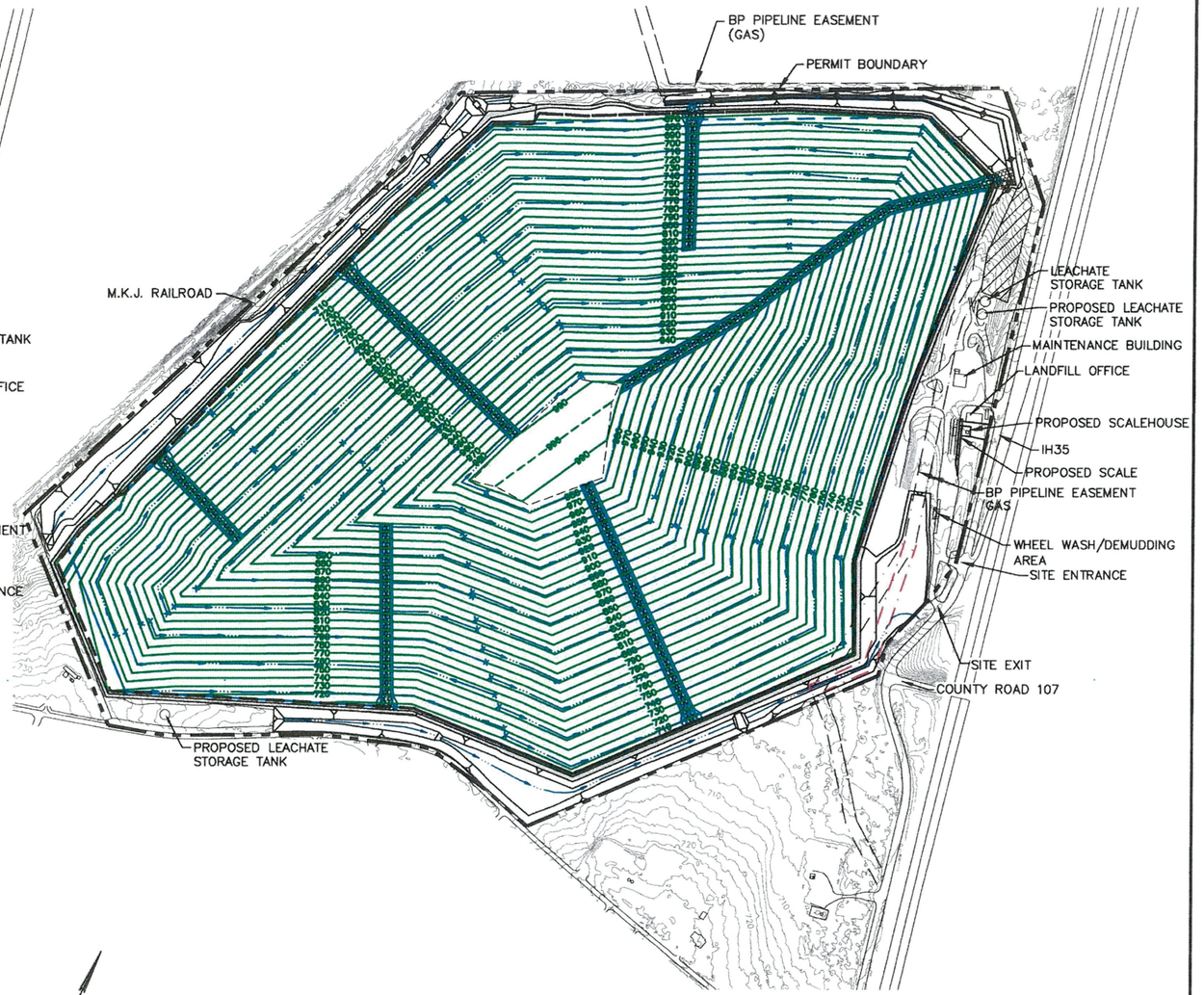
WWW.WCGRP.COM

FIGURE 4

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 4-SITE PLAN.dwg, jwilson, 1:2



PERMITTED LANDFILL COMPLETION PLAN



PROPOSED LANDFILL COMPLETION PLAN

0 300 600
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 5-LANDFILL COMP. PLAN.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 5

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G:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 5-LANDFILL COMPLETION PLAN.dwg, jwilson, 1:2

ATTACHMENT 2

BIOLOGICAL ASSESSMENT REPORT

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

MAJOR PERMIT AMENDMENT APPLICATION

BIOLOGICAL ASSESSMENT REPORT

Prepared for

Texas Regional Landfill Company, LP

August 2021

Prepared by

Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-109
I/IIB-129

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1 INTRODUCTION

The purpose of this document is to assess the effects of the proposed Turkey Creek Landfill expansion on federal and state-listed threatened and endangered species that may occur in the project area. Turkey Creek Landfill, a Type I landfill as currently permitted by the Texas Commission on Environmental Quality (TCEQ), is owned and operated by Texas Regional Landfill Company, LP, which is a wholly-owned subsidiary of Waste Connections, Inc. Waste Connections, Inc., one of the largest waste management companies in the United States, provides waste collection, transfer, and disposal services for residential, commercial, and industrial customers throughout the country. The Turkey Creek Landfill is located in Johnson County, Texas, approximately 2.5 miles south of the City of Alvarado on the west side of U.S. Interstate Highway 35 (IH-35). A site location map is included on Figure 1 of Attachment A. The expansion involves increasing the amount of waste fill within the currently permitted waste footprint by increasing the height of the final fill grades. The permitted landfill disposal footprint has been disturbed by disposal cell construction or support facilities, roads, and drainage features construction.

Photographs of the property are provided in Attachment B.

2 HABITAT DESCRIPTION

The project is located in the East Cross Timbers ecoregion of Texas (Diggs, G.M., Jr., et al., 2006; Correll and Johnston, 1979). The East Cross Timbers occurs largely on sandy soils with parent material from the Woodbine formation. Soils can be slightly acidic and consist of sandy to sandy loams. Land use in this region varies between urban and rural types and includes industrial, transportation, ranching and farming. The vegetation historically consisted of woodlands dominated by post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), cedar elm (*Ulmus crassifolia*), pecan (*Carya illinoinensis*), bois d'arc (*Maclura pomifera*), eastern redcedar (*Juniperus virginiana*), mesquite (*Prosopis glandulosa*), gum bumelia (*Sideroxylon lanuginosum*), hawthorn (*Crataegus* spp.), greenbriar (*Smilax* spp.). Numerous streams course through the region and are dominated by pecans, bur oak (*Quercus macrocarpa*), American elm (*Ulmus americana*), slippery elm (*U. rubra*), ash (*Fraxinus* spp.), cottonwood (*Populus deltoides*), sugar hackberry (*Celtis laevigata*) and black willow (*Salix nigra*).

Vegetation observed during the field visit on July 17, 2018 consisted of American elm, pecan, black willow, giant ragweed (*Ambrosia trifida*), roughleaf dogwood (*Cornus drummondii*), cottonwood, poison ivy (*Toxicodendron radicans*), cat greenbriar (*Smilax glauca*), sumpweed (*Iva annua*), Johnsongrass (*Sorghum halepense*), partridge pea (*Chamaecrista fasciculata*), Canada wildrye (*Elymus canadensis*), goldenrod (*Solidago* spp.), rattlepod (*Sesbania* spp.) and sunflower (*Helianthus* spp.).

3 PROTECTION OF THREATENED AND ENDANGERED SPECIES

The purpose of the Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems on which they depend. It is administered by the U.S. Fish and Wildlife Service (USFWS) and the Commerce Department's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife such as whales and anadromous fish such as salmon.

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments (USFWS, Endangered Species Homepage, July 2018).

The USFWS and the Texas Parks and Wildlife Department (TPWD) provide protection for a variety of threatened and endangered species in Texas. Databases of these agencies were reviewed to determine state and/or federally listed threatened or endangered species that occur or historically have occurred in Johnson County.

The USFWS lists two endangered species and three threatened species as occurring in Johnson County (refer to Table 1 of Attachment C). No critical habitat for any federally threatened or endangered species occurs in the project area.

In addition to federally listed species, the TPWD lists three endangered species and eight threatened species as occurring in Johnson County (refer to Table 1 of Attachment C).

A copy of the TPWD List of Rare Species is provided in Attachment D. A copy of the USFWS's IPaC Resource List of Jurisdictional Species is provided in Attachment E.

4 SPECIES DESCRIPTIONS

The interior least tern and red knot should be considered only for wind energy projects within the migratory route of these species. The whooping crane and piping plover are considered migratory through this area. Although migratory species occasionally stop over at points along their migratory routes, use of the landfill area would be highly unlikely due to the current land uses of the site.

Habitat for the white-faced ibis and black rail is not present on the site. Therefore, the proposed project would have no impact on these species.

The golden-cheeked warbler requires specific composition of woody species. The warbler prefers juniper-oak woodlands and is dependent on mature Ashe juniper. Suitable habitat for this species was not observed within the project area.

Two mollusks are state-listed as threatened and include the Brazos heelsplitter and Texas fawnfoot. Appropriate habitat was not found within the project area.

The Brazos water snake occurs in the upper Brazos River. Suitable habitat was not found within the project area.

The Texas horned lizard occupies open, arid, and semi-arid regions with sparse vegetation. Additionally, it prefers loose loamy or sandy soils. These lizards feed almost exclusively on harvester ants. No harvester ant colonies were observed during the field investigation. No Texas horned lizards were observed during the field investigation. It is unlikely that horned lizards would utilize the area.

5 CONCLUSIONS

No suitable habitat exists on the site for any species listed for Johnson County, nor has critical habitat been designated in the project area for any threatened and endangered species. The landfill expansion will not result in the destruction or adverse modification of any federally designated critical habitat for any threatened or endangered species, nor cause or contribute to the taking of any listed threatened or endangered species. Therefore, no further investigation for threatened and endangered species is recommended.

6 REFERENCES

Correll, D.S. and M.C. Johnston. 1979. *Manual of the Vascular Plants of Texas.* The University of Texas at Dallas. Richardson, Texas.

Diggs, G.M., Jr., B.L. Lipscomb, and R.J. O'Kennon. 1999. *Illustrated Flora of North Central Texas.* Botanical Research Institute of Texas and Austin College. Fort Worth, Texas.

ATTACHMENT A

FIGURES



0 1/2 1
SCALE IN MILES

LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 1-SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1

0:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 1-SITE LOCATION MAP.dwg, jpuhr, 1:2

ATTACHMENT B

SITE PHOTOGRAPHS



Photo 1 – Typical view of the project area along the eastern edge. The expansion area is located to the left of the gravel road.



Photo 2 – Typical view of the expansion area along the northern edge looking east. The proposed expansion area is located on the right side of the gravel road.



Photo 3 – Typical view along the north boundary looking west. The proposed landfill expansion area is located to the left of the perimeter road.



Photo 4 – Typical view from the northwest corner looking south. Note the red marker in the photo. The proposed expansion project area is to the left of the red marker.



Photo 5 – View of the stormwater facility located within the landfill expansion area.



Photo 6 – Typical view of the expansion area along the western edge.

ATTACHMENT C

TABLE 1 – LIST OF THREATENED AND ENDANGERED SPECIES POTENTIALLY OCCURRING IN JOHNSON COUNTY

THREATENED & ENDANGERED SPECIES TABLE

TABLE 1
POSSIBLE EFFECTS TO LISTED SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT AREA
(JOHNSON COUNTY, TEXAS)

Common Name *(Scientific Name)*	State Status	Federal Status	Description of Suitable Habitat	Unique, Critical, or Designated Habitat	Effects Discussion
Birds					
Golden-cheeked Warbler (*Setophaga chrysoparia*)	E	E	Prefers juniper-oak woodlands and is dependent on mature Ashe juniper with long bark strips	No	No impact; habitat not present
Interior Least Tern (*Sterna antillarum athalassos*)	E	DL	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams and rivers; also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc.); eats small fish and crustaceans; when breeding, forages within a few hundred feet of colony	No	No impact; rare transitory migrant
Red Knot (*Calidris canutus rufa*)	T	T	Prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters	No	No impact; rare transitory migrant
Black Rail *(Laterallus jamaicensis*)	T	T	Occurs in salt, brackish, and freshwater marshes, pond borders, wwet meadows, and grassy swamps.	No	No impact; habitat not present
Piping Plover (*Charadrius melodus*)	T	T	Found on islands along the Texas Gulf Coast, primarily barrier islands. Primary prey for wintering plovers includes polychaete marine worms, various crustaceans, insects, and occasionally bivalve mollusks	No	No impact; rare transitory migrant
White-faced Ibis (*Plegadis chihi*)	T		Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	No	No impact; habitat not present
Whooping Crane (*Grus americana*)	E	E	Potential migrant via plains throughout most of state to coast; winters on coastal marshes	No	No impact; habitat not present
Mollusks					
Brazos heelsplitter (*Potamilus streckersoni*)	T		Reported from streams but not far into the headwaters. Typically found in standing to slow-flowing water in soft substrates consisting of silt, mud or sand.	No	No impact; habitat not present

TABLE 1 POSSIBLE EFFECTS TO LISTED SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT AREA (JOHNSON COUNTY, TEXAS)					
Common Name *(Scientific Name)*	**State Status**	**Federal Status**	**Description of Suitable Habitat**	**Unique, Critical, or Designated Habitat**	**Effects Discussion**
Texas fawnfoot (*Truncilla macrodon*)	T		This species occurs in the Brazos and Colorado river basins; prefers sand and gravel substrates and can include bank habitats and occasional backwaters; presumed host is freshwater drum	No	No impact; habitat not present
Reptiles					
Brazos Water Snake (*Nerodia harteri*)	T		Occurs in the upper Brazos River drainage basin; prefers riffles in shallow water with rocky bottoms and rocky portions of banks	No	No impact; habitat not present
Texas Horned Lizard (*Phrynosoma cornutum*)	T		Open, arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush, or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive	No	No impact

Note: E – Endangered
T – Threatened
DL – Delisted Taxon, recovered, being monitored first five years

ATTACHMENT D

TPWD RARE SPECIES LIST

Last Update: 6/22/2021

JOHNSON COUNTY

AMPHIBIANS

Strecker's chorus frog *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Woodhouse's toad *Anaxyrus woodhousii*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: SU

BIRDS

bald eagle *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B,S3N

black rail *Laterallus jamaicensis*

Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of Salicornia

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

black-capped vireo *Vireo atricapilla*

Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3B

chestnut-collared longspur *Calcarius ornatus*

According to Partners in Flight's Landbird Conservation Plan (2016), this species has a continental decline of 85%. Occurs in open shortgrass settings especially in patches with some bare ground. Also occurs in grain sorghum fields and Conservation Reserve Program lands

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

DISCLAIMER

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JOHNSON COUNTY

BIRDS

Franklin's gull *Leucophaeus pipixcan*

This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

golden-cheeked warbler *Setophaga chrysoparia*

Ashe juniper in mixed stands with various oaks (Quercus spp.). Edges of cedar brakes. Dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S2S3B

interior least tern *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: DL: Delisted	State Status: E	SGCN: N
Endemic: N	Global Rank: G4T3Q	State Rank: S1B

lark bunting *Calamospiza melanocorys*

According to Partners in Flight's Landbird Conservation Plan (2016), this species has a continental decline of 86%. Overall, it's a generalist in most short grassland settings including ones with some brushy component plus certain agricultural lands that include grain sorghum. Short grasses include sideoats and blue gramas, sand dropseed, prairie junegrass (Koeleria), buffalograss also with patches of bluestem and other mid-grass species. This bunting will frequent smaller patches of grasses or disturbed patches of grasses including rural yards. It also uses weedy fields surrounding playas. This species avoids urban areas and cotton fields.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

mountain plover *Charadrius montanus*

Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

piping plover *Charadrius melodus*

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JOHNSON COUNTY

BIRDS

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

rufa red knot *Calidris canutus rufa*

Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (Donax spp.) on beaches and dwarf surf clam (Mulinia lateralis) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4T2	State Rank: S2N

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S2

white-faced ibis *Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

whooping crane *Grus americana*

Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1N

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JOHNSON COUNTY

FISH

Mississippi silvery minnow *Hybognathus nuchalis*

Found in eastern Texas streams, from the Brazos River eastward and northward to the Red River; found in moderate current; silty, muddy, or rocky substrate. In Texas, adults likely to inhabit smaller tributary streams.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G5	State Rank: S4

INSECTS

a caddisfly *Neotrichia juani*

Specimens were collected from perennial and ephemeral rivers, and small spring-fed streams (Harris and Tiemann 1993).

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G1	State Rank: S1

American bumblebee *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G3G4	State Rank: SNR

MAMMALS

big brown bat *Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

black-tailed prairie dog *Cynomys ludovicianus*

Dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

cave myotis bat *Myotis velifer*

Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (Hirundo pyrrhonota) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S2S3

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JOHNSON COUNTY

MAMMALS

eastern red bat *Lasiurus borealis*

Red bats are migratory bats that are common across Texas. They are most common in the eastern and central parts of the state, due to their requirement of forests for foliage roosting. West Texas specimens are associated with forested areas (cottonwoods). Also common along the coastline. These bats are highly mobile, seasonally migratory, and practice a type of "wandering migration". Associations with specific habitat is difficult unless specific migratory stopover sites or wintering grounds are found. Likely associated with any forested area in East, Central, and North Texas but can occur statewide.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

eastern spotted skunk *Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S3

hoary bat *Lasiurus cinereus*

Hoary bats are highly migratory, high-flying bats that have been noted throughout the state. Females are known to migrate to Mexico in the winter, males tend to remain further north and may stay in Texas year-round. Commonly associated with forests (foliage roosting species) but are found in unforested parts of the state and lowland deserts. Tend to be captured over water and large, open flyways.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

long-tailed weasel *Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

mountain lion *Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

Muskrat *Ondatra zibethicus*

Found in fresh or brackish marshes, lakes, ponds, swamps, and other bodies of slow-moving water. Most abundant in areas with cattail. Dens in bank burrow or conical house of vegetation in shallow vegetated water. It is primarily found in the Rio Grande near El Paso and in SE Texas in the Houston area.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

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JOHNSON COUNTY

MAMMALS

swamp rabbit *Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

tricolored bat *Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S3S4

western hog-nosed skunk *Conepatus leuconotus*

Habitats include woodlands, grasslands & deserts, to 7200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. telmalestes

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

MOLLUSKS

Brazos Heelsplitter *Potamilus streckersoni*

Reported from streams, but not far into the headwaters, to large rivers, and some reservoirs. In riverine systems occurs most often in nearshore habitats such as banks and backwater pools but occasionally in mainchannel habitats such as riffles. Typically found in standing to slow-flowing water in soft substrates consisting of silt, mud or sand but occasionally in moderate flows with gravel and cobble substrates (Randklev et al. 2014b,c; Tsakiris and Randklev 2016b; Smith et al. 2019) [Mussels of Texas 2020]

Federal Status:	State Status: T	SGCN: Y
Endemic: Y	Global Rank: GNR	State Rank: SNR

Texas Fawnsfoot *Truncilla macrodon*

Occurs in large rivers but may also be found in medium-sized streams. Is found in protected near shore areas such as banks and backwaters but also riffles and point bar habitats with low to moderate water velocities. Typically occurs in substrates of mud, sandy mud, gravel and cobble. Considered intolerant of reservoirs (Randklev et al. 2010; Howells 2010o; Randklev et al. 2014b,c; Randklev et al. 2017a,b). [Mussels of Texas 2019]

Federal Status: C	State Status: T	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S2

REPTILES

Brazos water snake *Nerodia harteri*

Aquatic: Shallow, fast-flowing water with a rocky or gravelly substrate preferred. Adults can be found in deep water with mud bottoms, such as large section fo rivers and reservoirs. Riffle habitat is particularly important for this species.

Federal Status:	State Status: T	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

DISCLAIMER

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JOHNSON COUNTY

REPTILES

eastern box turtle *Terrapene carolina*

Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Prairie Skink *Plestiodon septentrionalis*

The prairie skink can occur in any native grassland habitat across the Rolling Plains, Blackland Prairie, Post Oak Savanna and Pineywoods ecoregions.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

slender glass lizard *Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

smooth softshell *Apalone mutica*

Aquatic: Large rivers and streams; in some areas also found in lakes and impoundments (Ernst and Barbour 1972). Usually in water with sandy or mud bottom and few aquatic plants. Often basks on sand bars and mudflats at edge of water. Eggs are laid in nests dug in high open sandbars and banks close to water, usually within 90 m of water (Fitch and Plummer 1975).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Texas garter snake *Thamnophis sirtalis annectens*

Terrestrial and aquatic: Habitats used include the grasslands and modified open areas in the vicinity of aquatic features, such as ponds, streams or marshes. Damp soils and debris for cover are thought to be critical.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G5T4	State Rank: S1

Texas horned lizard *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

western box turtle *Terrapene ornata*

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JOHNSON COUNTY

REPTILES

Terrestrial: Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

western massasauga *Sistrurus tergeminus*

Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3S4

PLANTS

Hall's prairie clover *Dalea hallii*

In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S2

Reverchon's scurfpea *Pediomelum reverchonii*

Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; Perennial; Flowering Jun-Sept; Fruiting June-July

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Texas milk vetch *Astragalus reflexus*

Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

tree dodder *Cuscuta exaltata*

Parasitic on various Quercus, Juglans, Rhus, Vitis, Ulmus, and Diospyros species as well as Acacia berlandieri and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

DISCLAIMER

The information on this web application is provided "as is" without warranty as to the currentness, completeness, or accuracy of any specific data. The data provided are for planning, assessment, and informational purposes. Refer to the Frequently Asked Questions (FAQs) on the application website for further information.

ATTACHMENT E

USFWS IPAC RESOURCE LIST

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office
2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247
Phone: (817) 277-1100 Fax: (817) 277-1129
http://www.fws.gov/southwest/es/arlingtontexas/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

In Reply Refer To:
Consultation Code: 02ETAR00-2021-SLI-2910
Event Code: 02ETAR00-2021-E-06404
Project Name: Turkey Creek Landfill Expansion

August 31, 2021

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. *No effect* - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. *May affect, but is not likely to adversely affect* - the appropriate determination when a proposed action's anticipated effects to listed species or critical habitat are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. *May affect, is likely to adversely affect* - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a consequence of the proposed action, and the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service has performed up-front analysis for certain project types and species in your project area. These analyses have been compiled into *determination keys*, which allows an action agency, or its designated non-federal representative, to initiate a streamlined process for determining a proposed project's potential effects on federally listed species. The determination keys can be accessed through IPaC.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (https://www.fws.gov/birds/management/managed-species/eagle-management.php). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php.

For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

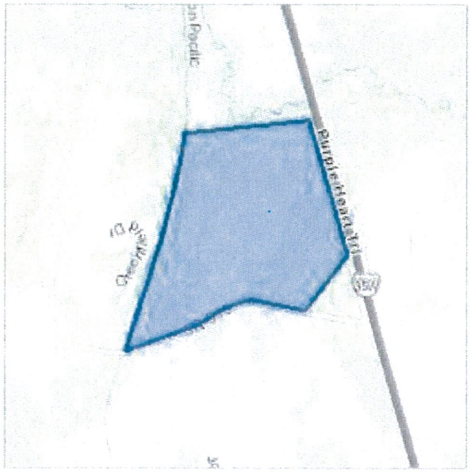
Arlington Ecological Services Field Office
2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247
(817) 277-1100

Project Summary

Consultation Code: 02ETAR00-2021-SLI-2910
Event Code: 02ETAR00-2021-E-06404
Project Name: Turkey Creek Landfill Expansion
Project Type: Landfill
Project Description: Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain the authorization for an expansion of the existing Turkey Creek Landfill.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@32.353799300000006,-97.2027978592356,14z



Counties: Johnson County, Texas

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Golden-cheeked Warbler (=wood) *Dendroica chrysoparia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/33	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. The location of the critical habitat is not available. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

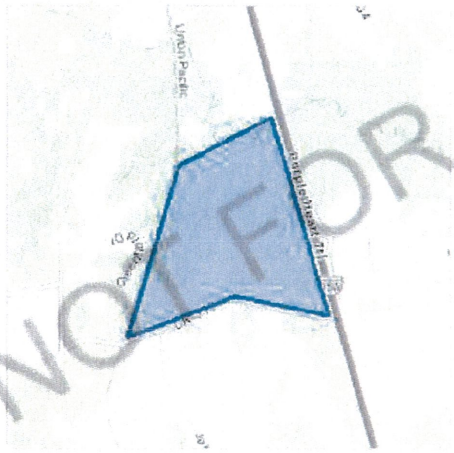
This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Johnson County, Texas



Local office

Arlington Ecological Services Field Office

(817) 277-1100
(817) 277-1129

2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247

http://www.fws.gov/southwest/es/arlingtontexas/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME STATUS

NOT FOR CONSULTATION

Golden-cheeked Warbler (=wood) Dendroica chrysoparia — Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/33

Piping Plover Charadrius melodus — Threatened
This species only needs to be considered if the following condition applies:
- Wind Energy Projects

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/6039

Red Knot Calidris canutus rufa — Threatened
Wherever found
This species only needs to be considered if the following condition applies:
- Wind Energy Projects

There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/1864

Whooping Crane Grus americana — Endangered
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/758

NOT FOR CONSULTATION

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NOT FOR CONSULTATION

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

Red-headed Woodpecker Melanerpes erythrocephalus Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

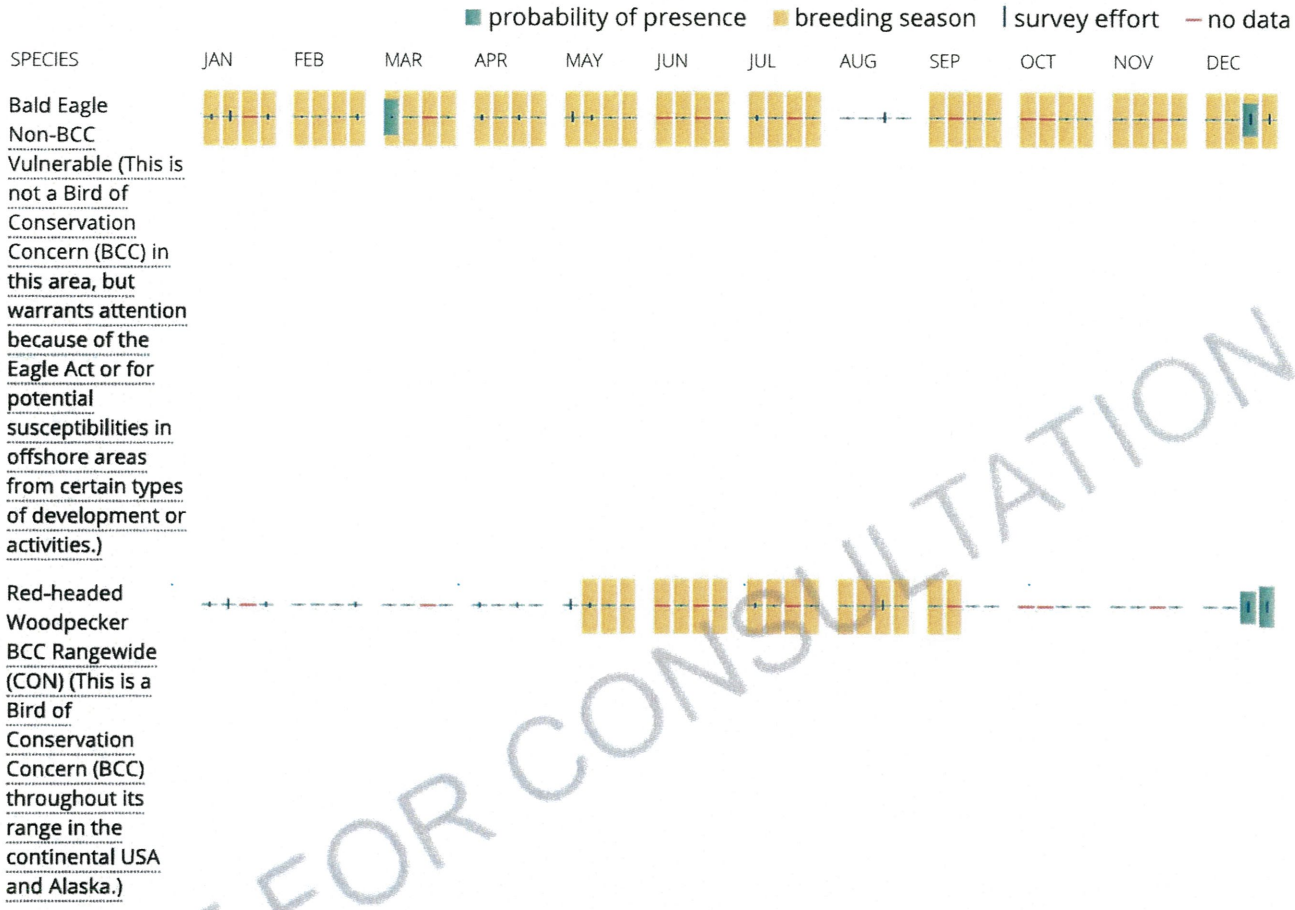
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

NOT FOR CONSULTATION

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



NOT FOR CONSULTATION

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

NOT FOR CONSULTATION

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

NOT FOR CONSULTATION

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

COORDINATION WITH
U.S. ARMY CORPS OF ENGINEERS

- June 15, 2021 USACE Determination Letter
- April 16, 2021 WCG Request for Review Letter

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, FORT WORTH DISTRICT
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

June 15, 2021

Regulatory Division

SUBJECT: SWF-2019-00087, Turkey Creek Landfill Expansion

Gary Bartels
Texas Regional Landfill Company, LP
9100 South I-35W
Alvarado, Texas 76009
gary.bartels@wasteconnections.com

Dear Mr. Bartels:

This letter is regarding information received April 16, 2021, and subsequent submittals dated June 8 and 16, 2021, concerning a proposal by the Texas Regional Landfill Company, LP, to expand the existing Turkey Creek Landfill located near Alvarado, Johnson County, Texas. This project has been assigned Project Number SWF-2019-00087. Please include this number in all future correspondence concerning this project.

This project has been reviewed in accordance with Section 404 of the Clean Water Act. Under the authority of Section 404, Department of the Army (DA) permits are required for the discharge of fill material into waters of the U.S. Waters of the U.S. include the area below the ordinary high water mark of stream channels and lakes or ponds connected to the tributary system, and wetlands adjacent to these waters. Isolated waters and wetlands, as well as man-made channels, may be waters of the U.S. in certain circumstances, which must be determined on a case-by-case basis.

Based on your submittal and other information available, we have determined that the proposed work is exempt from regulation under the Section 404(f) exemption found at 33 CFR Part 323.4(a)(5). Although a Department of the Army permit will not be required for this activity, this does not eliminate the requirements that other applicable federal, state, tribal, and local permits are obtained if needed. Please be advised that deviations from the original plans and specifications of this project could require additional authorization from this office.

Thank you for your interest in our nation's water resources. If you have any questions concerning our regulatory program, please refer to our website at http://www.swf.usace.army.mil/Missions/Regulatory or contact Mr. Darvin Messer at the address above, by telephone (817) 886-1744, or by email Darvin.Messer@usace.army.mil.

Please help the regulatory program improve its service by completing the survey on the following website: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey

Sincerely,

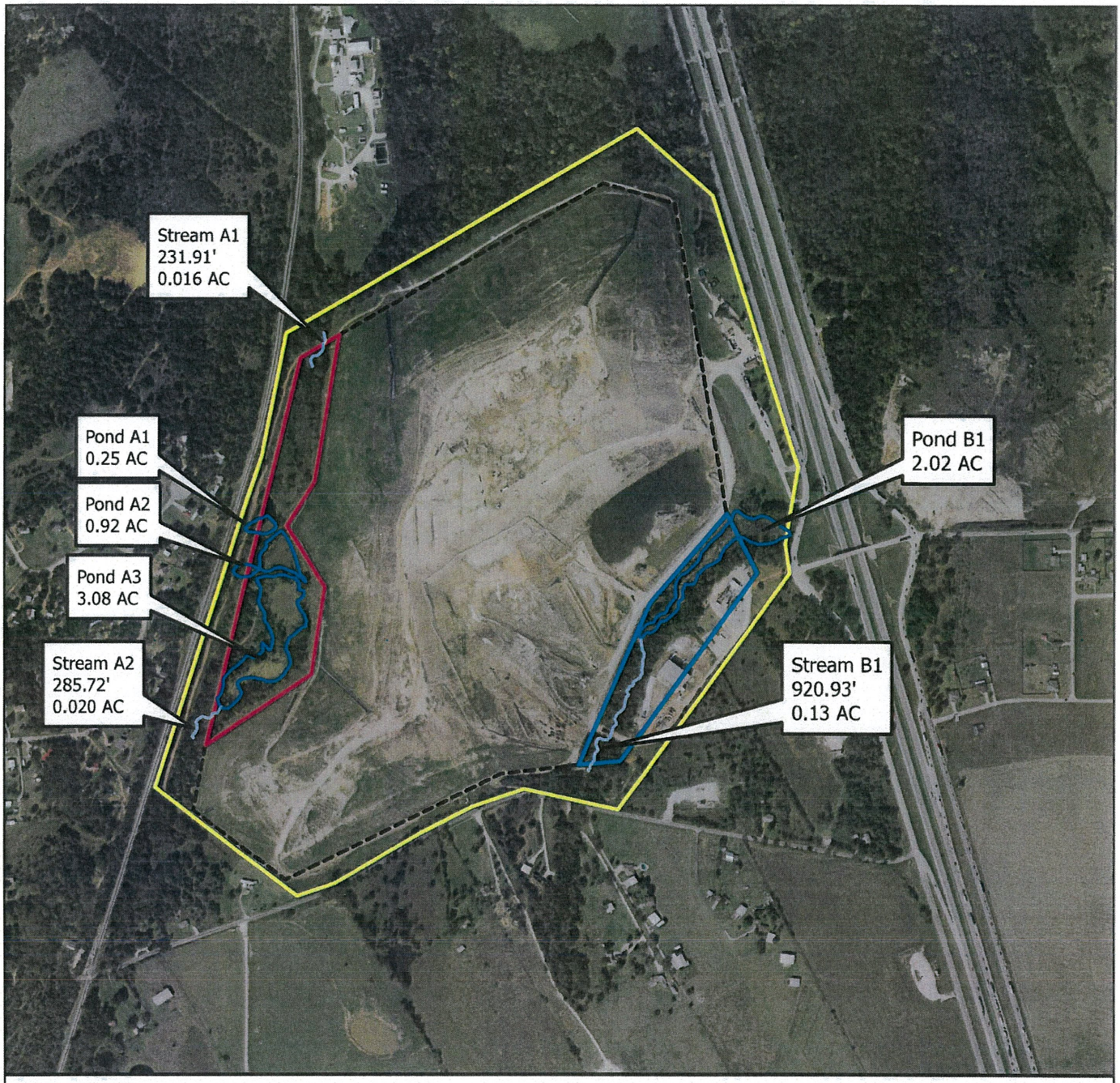
WALKER.JENNIFER.RILEY.1027696925

Digitally signed by WALKER.JENNIFER.RILEY.1027696925
Date: 2021.06.15 16:01:29 -05'00'

(for)Brandon W. Mobley
Chief, Regulatory Division

Electronic Copy Furnished:

Mr. Pete McKone, Weaver Consultants Group – pmckone@wcgrp.com



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PREPARED FOR: Texas Regional Landfill Company, LP	EXEMPT WATERS TURKEY CREEK LANDFILL JOHNSON COUNTY, TEXAS I/IIB-175	Weaver Consultants Group 305 E. Virginia St., # 301 McKinney, TX 75069 817-735-9770 www.wcgrp.com	DRAWN BY: CSS REVIEWED BY: JKW DATE: 6/11/2021 FILE: None PetesTurkeyCreekMap FIGURE 7

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LEGEND

- PROPERTY BOUNDARY
- DRAINAGE BOUNDARY
- RECEIVING WATER BODY
- DISCHARGE ROUTE
- POTENTIAL RECEIVING WATER BODY
- FENCE
- DITCH / CREEK / SWALE
- DRAINAGE STRUCTURES (PIPES, CULVERTS)
- FLOW DIRECTION
- DA-# — DRAINAGE AREA
- LD / ULD — LOADING / UNLOADING AREA
- 00 — OUTFALL (TO BE SAMPLED)
- 00 — OUTFALL (NOT SAMPLED)
- # — INFALL
- SAMPLE POINT
- H — FIRE HYDRANT
- OIL WATER SEPARATOR
- WATER WELL
- emo — EMERGENCY PLANT - SHUT OFF SWITCH
- M — MAN HOLE
- P — PORT-A-JOHN
- S — SEPTIC TANK
- STORM DRAIN
- D — DUMPSTER
- D — DRAIN COVER
- STRUCTURE
- DIRT ROAD
- CONCRETE
- SECONDARY CONTAINMENT
- S — SPILL KIT
- SCRAP METAL ROLLOFF/HOPPER
- T# — AST (ABOVEGROUND STORAGE TANK) #
- P# — PORTABLE CONTAINERS #
- E# — OIL FILLED EQUIPMENT #
- D — DRUMS / TOTES / #
- B — BAGHOUSES
- F# — TRANSFORMER #

RABA KISTNER
1011 W. Lewis Street
Conroe, TX 77301
281-210-0084 : www.rkci.com

Turkey Creek Landfill
9100 S I-35 W
Alvarado, TX 76009

SWPPP / SPCC SITE PLAN

FIGURE: 4

WASTE CONNECTIONS INC.

JOB#: AHF1905200 | Rev # 0 | APPR: AH | DSN: JC | SCALE: MAP SCALE | DATE: 06-04-2021

Puhr, Johnna

From: Marsh, Chuck
Sent: Monday, August 30, 2021 3:49 PM
To: Puhr, Johnna
Subject: FW: [EXTERNAL] RE: RE: Turkey Creek (SWF-2019-00087)
Attachments: 20210615 SWF-2019-00087 NPE Letter.pdf

Charles Marsh, PE
Project Director

Weaver Consultants Group
6420 Southwest Blvd. | Suite 206
Fort Worth, TX 76109
O: 817-735-9770 | F: 817-735-9775
cmarsh@wcgrp.com | www.wcgrp.com



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From: Messer, Orville D (Darvin) CIV USARMY CESWF (USA) <Darvin.Messer@usace.army.mil>
Sent: Tuesday, June 15, 2021 4:07 PM
To: Marsh, Chuck <cmarsh@wcgrp.com>; gary.bartels@wasteconnections.com; McKone, Peter <pmckone@wcgrp.com>; Turan, Nevzat <nturan@wcgrp.com>
Subject: [EXTERNAL] RE: RE: Turkey Creek (SWF-2019-00087)

All - Attached please find the exemption letter for the project.

Darvin Messer
Regulatory Project Manager
USACE Fort Worth District
(817) 886-1744
darvin.messer@usace.army.mil

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USACE Fort Worth District Regulatory Division Website: http://www.swf.usace.army.mil/Missions/Regulatory.aspx

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https://regulatory.ops.usace.army.mil/customer-service-survey/

-----Original Message-----
From: McKone, Peter
Sent: Friday, June 11, 2021 4:28 PM
To: Messer, Orville D (Darvin) CIV USARMY CESWF (USA)
Cc: Gary Bartels ; Marsh, Chuck ; Turan, Nevzat
Subject: [Non-DoD Source] RE: RE: Turkey Creek (SWF-2019-00087)

Darvin:

Per your request and our conversation yesterday, I have attached the AJD form and corresponding figure for your review. Should you need anything else or have any questions please don't hesitate to call or email.

Thanks for all your effort on this and have a good weekend!
Pete

Peter McKone

Senior Project Director

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-----Original Message-----
From: Messer, Orville D (Darvin) CIV USARMY CESWF (USA)
Sent: Thursday, June 10, 2021 11:13 AM
To: McKone, Peter
Cc: Gary Bartels ; Marsh, Chuck ; Turan, Nevzat
Subject: [EXTERNAL] RE: Turkey Creek (SWF-2019-00087)

Pete - I've jumped the gun a bit on this. To exempt the waters from jurisdiction, I'll need the attached form completed for the subject waters on-site that are upstream of the TPDES outfall points and subject to exemption. Itemize the aquatic resources in section D of the form and utilize the a(12) waste treatment exclusion. Then return to me in Word format to finalize and issue the NPR. Thanks.

Darvin Messer
Regulatory Project Manager
USACE Fort Worth District
(817) 886-1744
darvin.messer@usace.army.mil

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From: McKone, Peter
Sent: Tuesday, June 08, 2021 11:49 AM
To: Messer, Orville D (Darvin) CIV USARMY CESWF (USA)
Cc: Gary Bartels ; Marsh, Chuck ; Turan, Nevzat
Subject: [Non-DoD Source] Turkey Creek (SWF-2019-00087)

Darvin:

Thank you for the talk last week regarding the Turkey Creek landfill expansion project. As a result of that conversation we are providing you the attached letter explaining the stormwater aspects associated with the project site. Please let us know if you need additional information or have any questions.

Thanks,

Pete

Peter McKone

Senior Project Director

Weaver Consultants Group
6420 Southwest Blvd. | Suite 206

Fort Worth, TX 76109
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Puhr, Johnna

From:	Marsh, Chuck
Sent:	Monday, August 30, 2021 3:49 PM
To:	Puhr, Johnna
Subject:	FW: RE: Turkey Creek (SWF-2019-00087)
Attachments:	NWPR AJD Form (10 June 2020)dm1-new.docx; TurkeyCreek_ExemptWaters.pdf

Charles Marsh, PE
Project Director

Weaver Consultants Group
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Fort Worth, TX 76109
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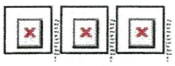

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Fort Worth, TX 76109
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https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fwww.wcgrp.com&c=E,1,dV94bdLMIL-WIewtIaX76iCeEbKYaIuDCz7RzqeTHzIhEKpwbbFt_NkqlUxmon8vQgUMKS-u9GFgteOqpF3sMSwacmf0_qFK7gnijctufF5cF0k8iAfp&typo=1
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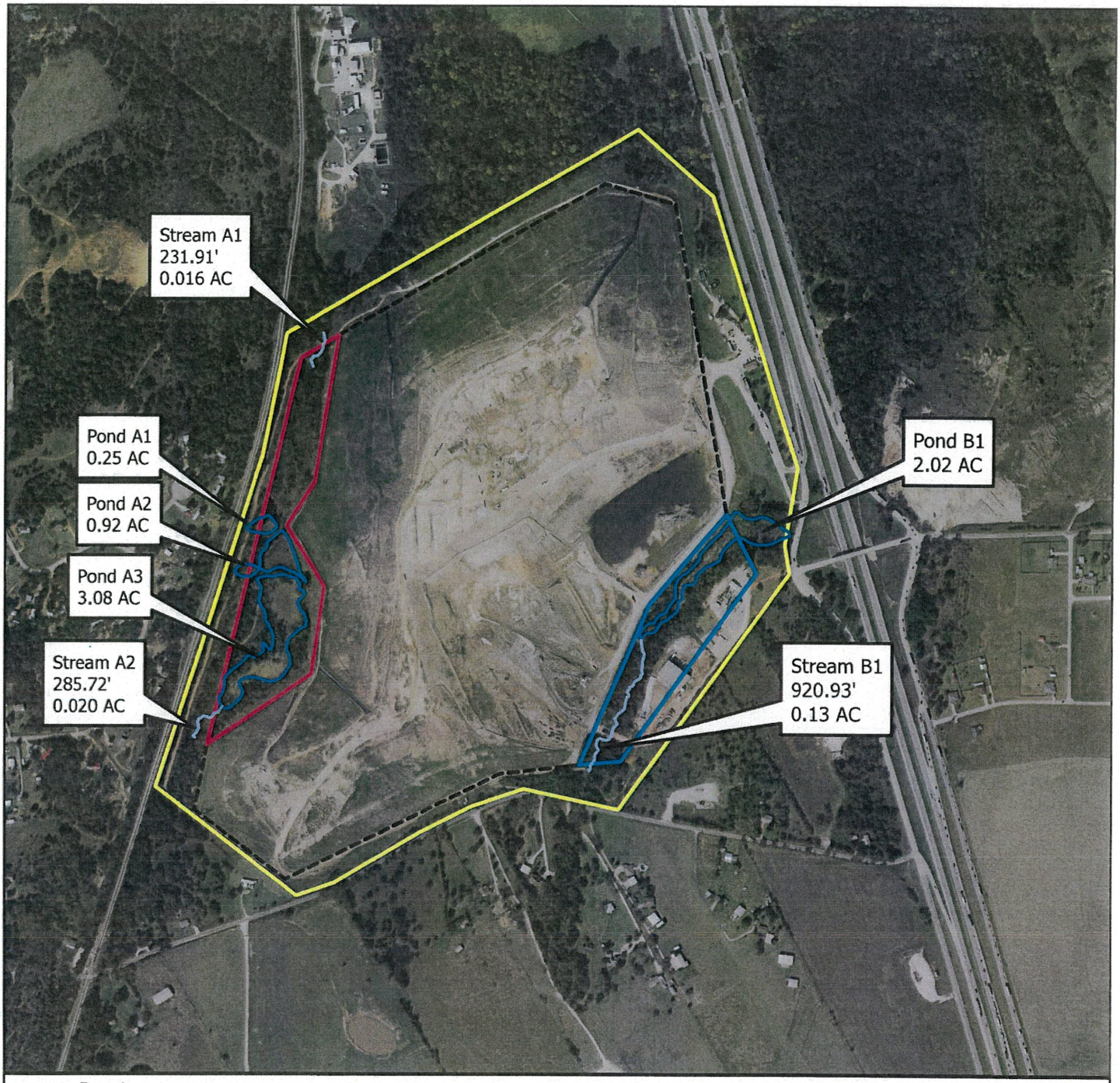

Pond
Stream
West Expansion Area
East Expansion Area
Site Boundary
Limits of Waste

N

0 400 800 1,600

1:9,600

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PREPARED FOR:

Texas Regional
Landfill Company, LP

EXEMPT WATERS

TURKEY CREEK LANDFILL

JOHNSON COUNTY, TEXAS

I/IIB-184

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Weaver Consultants Group
305 E. Virginia St., # 301
McKinney, TX 75069
817-735-9770 www.wcgrp.com

DRAWN BY:	CSS
REVIEWED BY:	JKW
DATE:	6/11/2021
FILE:	None
	PetesTurkeyCreekMap
FIGURE	7

P:\GIS\Templates\PetesTurkeyCreekMap.aprx, jwhanger, 6/11/2021, 11:53 AM

U.S. ARMY CORPS OF ENGINEERS
REGULATORY PROGRAM
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)
NAVIGABLE WATERS PROTECTION RULE

. ADMINISTRATIVE INFORMATION

Completion Date of Approved Jurisdictional Determination (AJD): Select.
ORM Number: (e.g. HQS-2020-00001-MSW).
Associated JDs: N/A or ORM numbers and identifiers (e.g. HQS-2020-00001-MSW-MITSITE)
Review Area Location[1]: State/Territory: Enter. City: Enter. County/Parish/Borough: Enter.
Center Coordinates of Review Area: Latitude Decimal Degrees. Longitude Decimal Degrees.

II. FINDINGS

A. Summary: Check all that apply. At least one box from the following list MUST be selected. Complete the corresponding sections/tables and summarize data sources.

- ☐ The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
- ☐ There are "navigable waters of the United States" within Rivers and Harbors Act jurisdiction within the review area (complete table in Section II.B).
- ☐ There are "waters of the United States" within Clean Water Act jurisdiction within the ☐review area (complete appropriate tables in Section II.C).
- ☒ There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in Section II.D).

B. Rivers and Harbors Act of 1899 Section 10 (§ 10)[2]

§ 10 Name	§ 10 Size		§ 10 Criteria	Rationale for § 10 Determination
N/A.	N/A.	N/A	N/A.	N/A.

C. Clean Water Act Section 404

Territorial Seas and Traditional Navigable Waters ((a)(1) waters):[3]				
(a)(1) Name	(a)(1) Size		(a)(1) Criteria	Rationale for (a)(1) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):				
(a)(3) Name	(a)(3) Size		(a)(3) Criteria	Rationale for (a)(3) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

Adjacent wetlands ((a)(4) waters):				
(a)(4) Name	(a)(4) Size		(a)(4) Criteria	Rationale for (a)(4) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

[1] Map(s)/figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
[3] A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD Form.

D. Excluded Waters or Features

Excluded waters ((b)(1) – (b)(12)):[4]				
Exclusion Name	Exclusion Size		Exclusion[5]	Rationale for Exclusion Determination
Pond A1	0.25	Acre(s)	(b)(12) Waste treatment system	Component of TPDES multi-sector storm water general permit no TXR05AP29
Pond A2	0.92	Acres		
Pond A3	3.08	Acres		
Stream A1	0.016	Acres		
Stream A2	0.02	Acres		
Pond B1	2.02	Acres		
Stream B1	0.13	Acres		

III. SUPPORTING INFORMATION

A. Select/enter all resources that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.

- ☐ Information submitted by, or on behalf of, the applicant/consultant: Title(s) and date(s)
  This information Select. sufficient for purposes of this AJD.
  Rationale: N/A or describe rationale for insufficiency (including partial insufficiency).
- ☐ Data sheets prepared by the Corps: Title(s) and/or date(s).
- ☐ Photographs: Select. Title(s) and/or date(s).
- ☐ Corps site visit(s) conducted on: Date(s).
- ☐ Previous Jurisdictional Determinations (AJDs or PJDs): ORM Number(s) and date(s).
- ☐ Antecedent Precipitation Tool: *provide detailed discussion in Section III.B.*
- ☐ USDA NRCS Soil Survey: Title(s) and/or date(s).
- ☐ USFWS NWI maps: Title(s) and/or date(s).
- ☐ USGS topographic maps: Title(s) and/or date(s).

Other data sources used to aid in this determination:

Data Source (select)	Name and/or date and other relevant information
USGS Sources	N/A.
USDA Sources	N/A.
NOAA Sources	N/A.
USACE Sources	N/A.
State/Local/Tribal Sources	N/A.
Other Sources	N/A.

B. Typical year assessment(s): N/A or provide typical year assessment for each relevant data source used to support the conclusions in the AJD.

C. Additional comments to support AJD: N/A or provide additional discussion as appropriate.

---

[4] Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.
[5] Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

ATTACHMENT 1

ENVIRONMENTAL REPORT

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

ENVIRONMENTAL REPORT

Prepared for

Texas Regional Landfill Company, LP

August 2021

Prepared by

Weaver Consultants Group, LLC
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-123

I/IIB-188

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1	**INTRODUCTION**	**1**
2	**METHODS**	**2**
	2.1 Desktop Analysis	2
	2.2 Soils	2
	2.3 Waters of the United States	3
	2.4 Threatened and Endangered Species	5
	2.5 Migratory Birds	6
3	**RESULTS AND RECOMMENDATIONS**	**7**
4	**REFERENCES**	**8**

ATTACHMENT A
Turkey Creek Landfill Expansion Site Plan

ATTACHMENT B
Figures

ATTACHMENT C
Photographs

ATTACHMENT D
Historical Aerials and Topographic Maps

ATTACHMENT E
Table 1 – Potential Effects to Listed Species Possibly Occurring Within the Project Area (Johnson County, Texas)

1 INTRODUCTION

Waste Connections contracted Weaver Consultants Group to perform an environmental assessment of the proposed Turkey Creek Landfill expansion project (Attachment A). The environmental assessment included an evaluation of waters of the U.S., threatened and endangered species investigation, and examination of other pertinent environmental issues. The Turkey Creek Landfill project is located in Johnson County approximately 2.15 miles south of Alvarado, Texas (Attachment B).

The purpose of this report is to describe conditions on the site and provide an assessment of the potential presence of jurisdictional waters, threatened and endangered species, and other relevant environmental topics to ensure compliance with Sections 404 and 401 of the Clean Water Act for expansion of the landfill (Attachment C).

2 METHODS

2.1 Desktop Analysis

The assessment looked at two tracts – one in the south and one in the west of the current landfill. The project area was mapped and analyzed to include:

- United States Geological Survey (USGS) – Geologic Map Database
- United States Department of Agriculture, Natural Resources Conservation Service (NRCS) Soils Data
- USGS 7.5-minute Topographic Map
- United States Fish and Wildlife Service (USFWS) – National Wetland Inventory (NWI)
- United States Environmental Protection Agency (EPA) Ecoregions
- United States Fish and Wildlife Service (USFWS), Threatened & Endangered Species for Johnson County,

2.2 Soils

Four soil units were found within the project area and included the following:

- Crosstell fine sandy loam, 3 to 8 percent slopes,
- Pulexas fine sandy loam, frequently flooded,
- Birome-Rayex complex, 5 to 20 percent slopes,
- Silstid loamy fine sand, 3 to 8 percent slopes.

The Crosstell fine sandy loam, 3 to 8 percent slopes soil unit is located on ridges and comes from clayey residuum weathered from claystone and sandstone. The drainage class is moderately well drained and the runoff class is very high. This soil unit is not listed as a hydric soil nor is it listed as Prime Farmland. The ecological site designation is Sandy Loam.

The Pulexas fine sandy loam, frequently flooded soil unit is found in floodplains and is derived from loamy alluvium. The natural drainage class is well drained, the runoff class is negligible, and frequency of flooding is frequent to none. This soil unit is not

listed as a hydric soil nor is it listed as Prime Farmland. The ecological site designation is Loamy Bottomland.

The Birome-Rayex complex, 5 to 20 percent slopes soil unit is formed from ridges with parent material from loamy residuum weathered from sandstone. The drainage class is well drained and the runoff class is high. It is found on summits. This soil unit is not listed as a hydric soil and is not listed as Prime Farmland. The ecological site designation is Sandy Loam.

The Silstid loamy fine sand, 3 to 8 percent slopes soil unit is found on ridges and comes from parent material of sandy residuum weathered from sandstone woodbine formation. This soil unit is not listed as a hydric soil and is not listed as Prime Farmland. The ecological site designation is Sandy.

2.3 Waters of the United States

Legal Background

The U.S. Army Corps of Engineers (USACE) regulates certain activities occurring in waters of the U.S. (WOUS) per Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act of 1899 (RHA). Under Section 404 of the CWA, authorization must be obtained from the USACE for discharges of dredged and fill material into WOUS. Under Section 10 of the RHA, the USACE regulates work in, or affecting, navigable WOUS.

Agencies that regulate impacts to the nation's water resources located within Texas include the USACE, U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), and the Texas Commission on Environmental Quality (TCEQ). Jurisdictional waters, or WOUS, are protected under guidelines outlined in Executive Order 11990 (Protection of Wetlands) in Sections 401 and 404 of the CWA and by the state's water quality review process. The USACE has primary regulatory authority for enforcing Section 404 requirements for WOUS, including wetlands.

Under Section 10 of the RHA, the USACE regulates navigable WOUS. Navigable waters are defined at 33 CFR 329 as those waters that are subject to the ebb and flow of the tide and/or are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody and is not extinguished by later actions or events that impede or destroy navigability. Navigable WOUS include many coastal waters, including bays and portions of major rivers.

The limit of USACE jurisdiction for non-tidal WOUS in the absence of adjacent wetlands is the ordinary high-water mark (OHWM). The OHWM is defined as that line

on the shore established by the fluctuations of water and indicated by physical characteristics such as the following:

- Clear, natural line impressed on the bank,
- Shelving,
- Changes in the character of the soil,
- Destruction of terrestrial vegetation,
- Presence of litter and debris, or
- Other appropriate means that consider the characteristics of the surrounding areas.

Jurisdictional wetlands are a category of WOUS and are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Delineations of wetlands must be conducted using the "Corps of Engineers Wetland Delineation Manual," USACE Waterways Experiment Station Wetlands Research Program Technical Report Y-87-1, dated January 1987, including all supplemental guidance. Jack County is located within the region covered by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0), dated March 2010 (USACE 2010).

In January 2001, the U.S. Supreme Court decided the Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. case. This case centered on how isolated wetlands would be regulated. In its decision, the court ruled that the USACE does not have jurisdiction over intrastate isolated waters that have no nexus to interstate commerce other than use by migratory birds. In the Western U.S., the ruling mostly affected regulation/protection of playa lakes, abandoned mining and borrow pits, hillside seeps, and other potentially isolated waters.

On June 19, 2006, the U.S. Supreme Court decided the Rapanos et ux., et al v. U.S. case. Following this decision, the USACE and EPA issued joint guidance on delineation of WOUS based on the Supreme Court decision. Under this guidance, potential WOUS have been classified as traditional navigable waters (TNW), relatively permanent waters (RPW) (having flow most of the year at least seasonally), or non-RPWs. Based on the guidance, TNWs and their adjacent wetlands and RPWs and their adjacent wetlands are WOUS. Wetlands that are bordering, contiguous, or neighboring another WOUS are considered adjacent. Additionally, wetlands that are within the 100-year floodplain of another WOUS are considered adjacent. Non-RPWs, wetlands contiguous or adjacent to non-RPWs, and wetlands adjacent to but that do not directly abut an RPW must demonstrate significant nexus on a case-by-case basis to determine the jurisdictional nature of these water features. The significant nexus test requires that a waterbody must have a substantial connection to a TNW by direct flow

or have a biological, chemical, and/or hydrological influence on a TNW. This guidance did not void the SWANCC decision.

The EPA and USACE published a new definition of WOUS, entitled the Navigable Waters Protection Rule (NWPR), that revised some types of waterbodies. The following are the waterbodies considered to be jurisdictional under the new rule:

- Territorial seas and traditional navigable waters,
- Tributaries,
- Lakes and ponds, and impoundments of jurisdictional waters, and
- Adjacent wetlands.

Waterbodies no longer listed as jurisdictional are ephemeral waterbodies. In addition, the agencies will no longer use significant nexus to determine jurisdiction. The NWPR took effect June 22, 2020 and is the law of the land for every state.

Observations

A field investigation was conducted of the project site on January 11 and 12, 2021. In the south tract one intermittent stream flowed northeastward toward US I-35. This stream was an un-named tributary to Turkey Creek approximately 3,000 feet to the northeast. The stream was located in a small v-shaped valley and was wooded throughout. The width at the ordinary high water mark averaged approximately 3-5 feet. Approximately halfway through the tract the stream was heavily impacted by beaver activity in the eastern portion of the drainage. The inundated area created by numerous beaver dams extended across the width of the valley (Appendix B).

Another un-named drainage was observed in the western tract. This ephemeral stream flowed to the north. Turkey Creek was located approximately 1,300 feet to the northeast. Several ponds were located along this drainageway. Based on historical aerial photographs it appears these ponds were manmade. Recent beaver activity was observed throughout this pond complex. The drainageway had an ordinary high water mark in some places but this feature disappeared in some places in the sections upgradient of the pond complex as well as downgradient from the pond complex. This pond complex and drainageway are located above the 100-year floodplain. This drainageway would be classified as ephemeral and, thus, non-jurisdictional.

2.4 Threatened and Endangered Species

The interior least tern and red knot should be considered only for wind energy projects within the migratory route of these species. The whooping crane and piping plover are considered migratory through this area. Although migratory species

occasionally stop over at points along their migratory routes, use of the landfill area would be highly unlikely due to the current land uses of the site.

Habitat for the white-faced ibis and black rail is not present on the site. Therefore, the proposed project would have no impact on these species.

The golden-cheeked warbler requires specific composition of woody species. The warbler prefers juniper-oak woodlands and is dependent on mature Ashe juniper. Suitable habitat for this species was not observed within the project area.

Two mollusks are state-listed as threatened and include the Brazos heelsplitter and Texas fawnfoot. Appropriate habitat was not found within the project area.

The Brazos water snake occurs in the upper Brazos River. Suitable habitat was not found within the project area.

The Texas horned lizard occupies open, arid, and semi-arid regions with sparse vegetation. Additionally, it prefers loose loamy or sandy soils. These lizards feed almost exclusively on harvester ants. No harvester ant colonies were observed during the field investigation. No Texas horned lizards were observed during the field investigation. It is unlikely that horned lizards would utilize the area.

2.5 Migratory Birds

The Migratory Bird Treaty Act of 1918 provides protection for a large number of migratory bird species. The Act specifically is a treaty between the U.S., Japan, Canada, Mexico, and Russia. The Act prohibits, unless permitted by regulations, any person to do the following for any species protected by the Act:

- Pursue; hunt; take; capture; kill; attempt to take, capture, or kill; possess; offer for sale; sell; offer to purchase; deliver for shipment; ship; cause to be shipped; deliver for transportation; transport; cause to be transported; carry; caused to be carried by any means whatever; receive for shipment, transportation or carriage; or export at any time or in any manner any migratory bird....or any part, nest, or egg of any such bird.

The Act is regulated by the USFWS. If a species is found, or an active nest is found, a permit from the USFWS must be obtained before take of the species can occur.

3 RESULTS AND RECOMMENDATIONS

An ephemeral drainage with a pond complex is located within the western expansion area. The drainage lacks an ordinary high water mark within some reaches and results in a disconnect. For these reasons, this drainage would not be jurisdictional.

It was determined by the USACE that the waterbodies within the expansion area were exempt under the Section 404(f) exemption found at 33 CFR Part 323.4(a)(5). This exemption. Specifically, the waterbodies were determined to be part of a waste treatment system as a component of TPDES multi-sector storm water general permit no. TXR05AP29.

No suitable habitat exists on the site for any species listed for Johnson County, nor has critical habitat been designated in the project area for any threatened and endangered species. The landfill expansion will not result in the destruction or adverse modification of any federally designated critical habitat for any threatened or endangered species, nor cause or contribute to the taking of any listed threatened or endangered species. Therefore, no further investigation for threatened and endangered species is recommended.

4 REFERENCES

Correll, D.S. and M.C. Johnston. 1979. *Manual of the Vascular Plants of Texas.* The University of Texas at Dallas. Richardson, Texas.

Diggs, G.M., Jr., B.L. Lipscomb, and R.J. O'Kennon. 1999. *Illustrated Flora of North Central Texas.* Botanical Research Institute of Texas and Austin College. Fort Worth, Texas.

Soil Conservation Service, 1974. Soil Survey of Jonson County Soil Survey. U.S. Department of Agriculture, Washington D.C.

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ATTACHMENT A

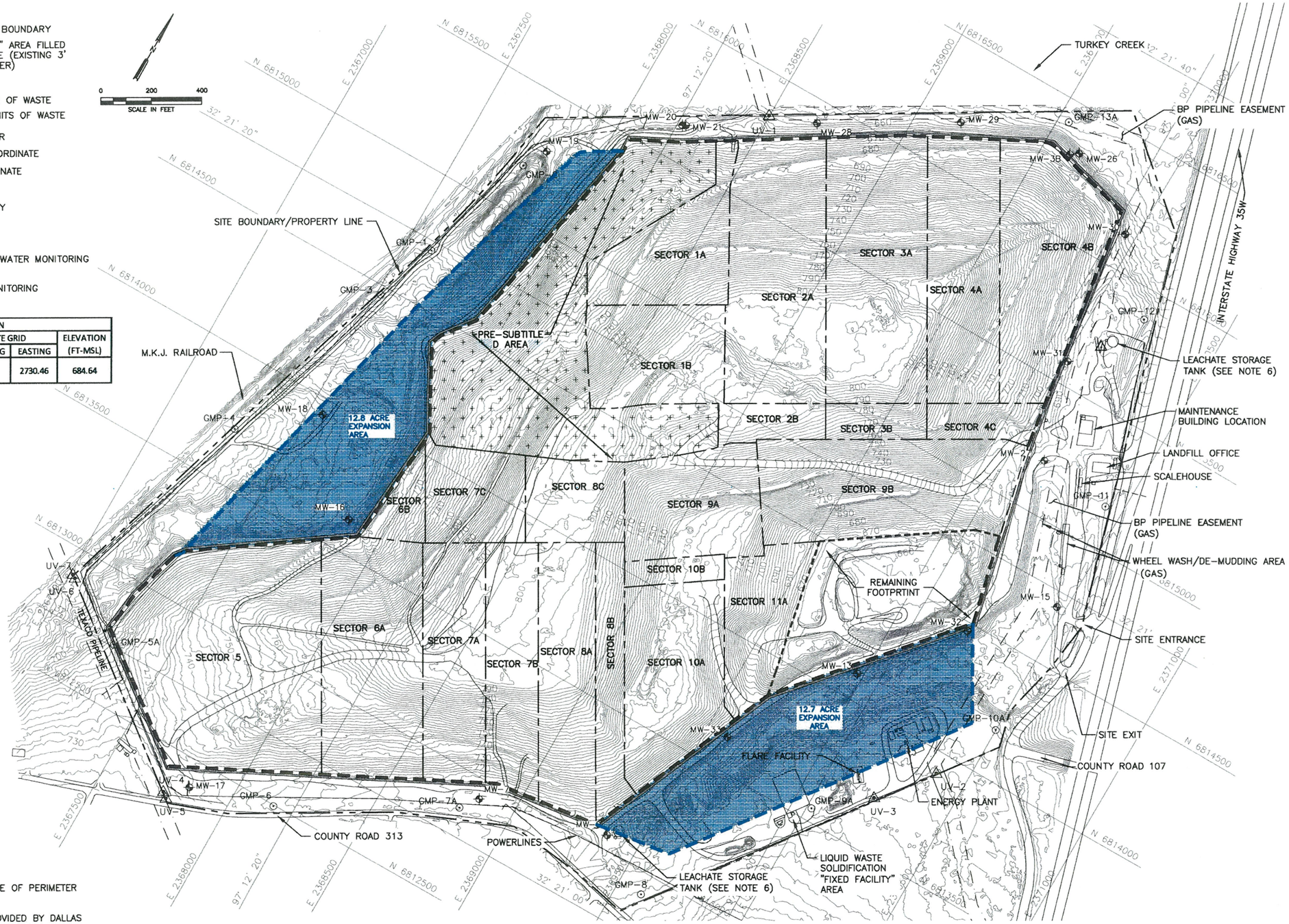
TURKEY CREEK LANDFILL EXPANSION SITE PLAN

LEGEND

- LANDFILL PERMIT BOUNDARY
- PRE-SUBTITLE "D" AREA FILLED WITH SOLID WASTE (EXISTING 3' CLAY BOTTOM LINER)
- LIMITS OF WASTE
- EXPANSION LIMITS OF WASTE
- CONSTRUCTED LIMITS OF WASTE
- 700 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- SITE BENCHMARK
- SECTOR BOUNDARY
- EASEMENT
- POWERLINES
- MW-16 — EXISTING GROUNDWATER MONITORING WELL LOCATION
- GMP-3 — EXISTING LFG MONITORING PROBE LOCATION

0 200 400
SCALE IN FEET

SITE BENCHMARK INFORMATION					
POINT NO.	STATE PLANE		SITE GRID		ELEVATION (FT-MSL)
	NORTHING	EASTING	NORTHING	EASTING	
169 (BRASS CAP ON CURB)	6815705.71	2370100.37	464.70	2730.46	684.64



NOTES:

1. BUFFER LINE COINCIDES WITH INSIDE EDGE OF PERIMETER ACCESS ROAD.
2. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY DALLAS AERIAL SURVEYS, INC. FROM AERIAL PHOTOGRAPHY FLOWN 1-8-2021.
3. GRID ORIGIN LOCATED BY LANDES AND ASSOCIATES, R.R.L.S., FORT WORTH, TEXAS.
4. THE SITE GRID SYSTEM USED TO DEVELOP SITE BENCHMARK INFORMATION IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NAD 83, NORTH CENTRAL ZONE.

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- [ ] DRAFT
- [X] FOR INFORMATIONAL PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 03/2021
FILE: 0771-368-11
CAD: ATT-1A-SITE PLAN.DWG
DRAWN BY: CAM
DESIGN BY: CAM
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

ATTACHMENT 1A

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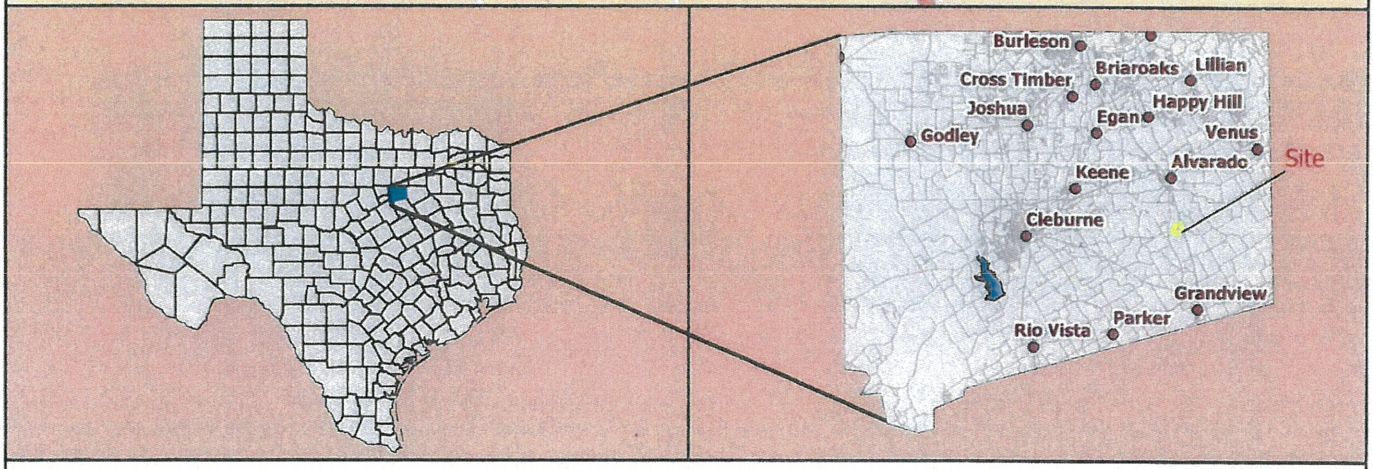
ATTACHMENT B

FIGURES





12.7 Acre Expansion Area

12.8 Acre Expansion Area

Site Boundary

Limits of Waste

0 1,250 2,500 5,000

1:30,000

N

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PREPARED FOR:

Texas Regional Landfill Company, LP

LOCATION MAP

TURKEY CREEK LANDFILL

JOHNSON COUNTY, TEXAS

I/IIB-201

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DRAWN BY:	CSS
REVIEWED BY:	JKW
DATE:	3/25/2021
FILE:	None
CAD:	PeteTemplates_TX
FIGURE	1

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12.7 Acre Expansion Area
12.8 Acre Expansion Area
Site Boundary
Limits of Waste

N

0 400 800 1600

1:9,600

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PREPARED FOR: Texas Regional Landfill Company, LP	AERIAL MAP TURKEY CREEK LANDFILL JOHNSON COUNTY, TEXAS I/IIB-202	Weaver Consultants Group 305 E. Virginia St., # 301 McKinney, TX 75069 817-735-9770 www.wcgrp.com	DRAWN BY: CSS REVIEWED BY: JKW DATE: 3/25/2021 FILE: None CAD:PeteTemplates_TX FIGURE 2

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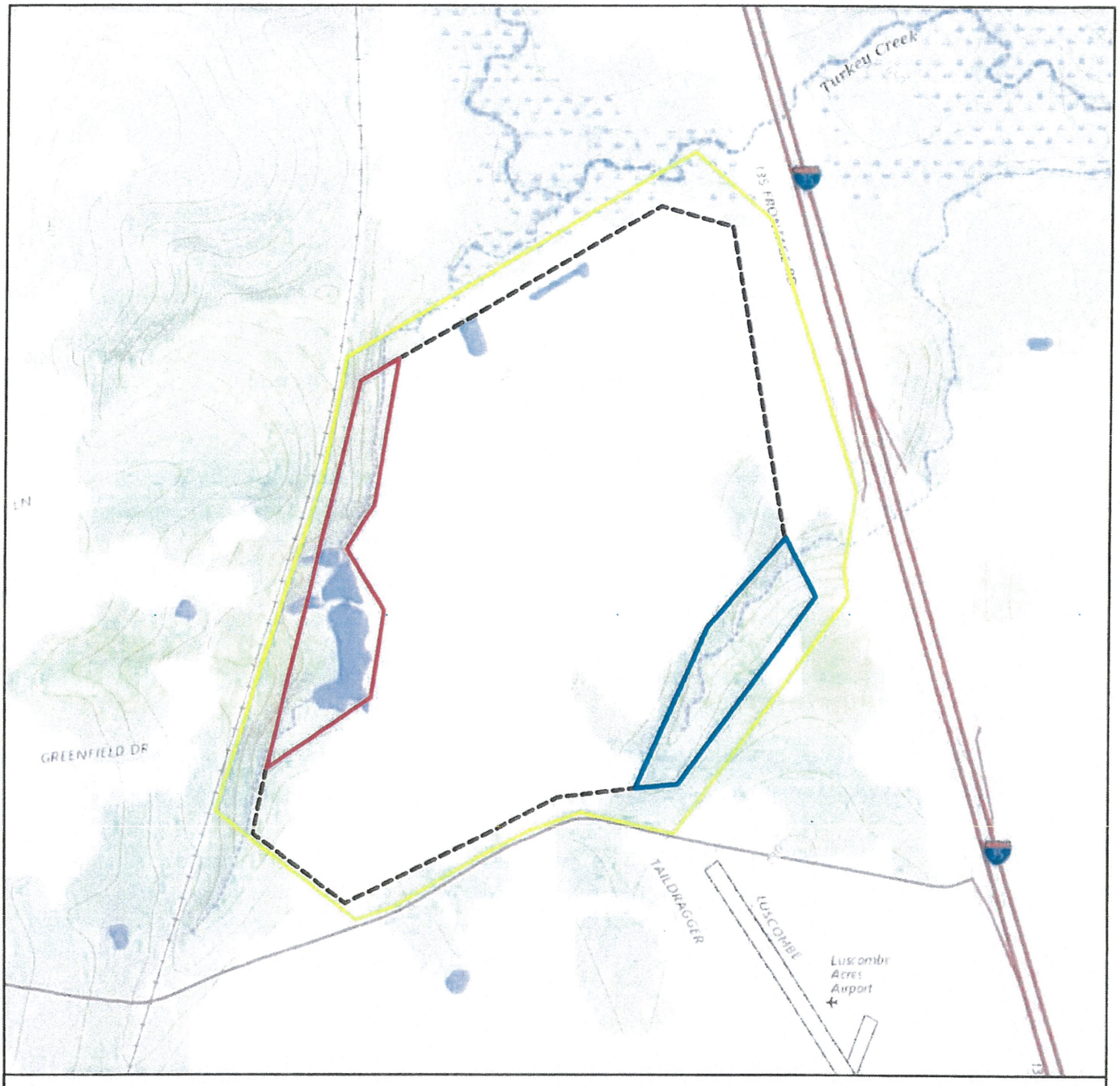

12.7 Acre Expansion Area

12.8 Acre Expansion Area

Site Boundary

Limits of Waste

N

0 400 800 1,600

1:9,600

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Texas Regional Landfill Company, LP

USGS TOPOGRAPHIC MAP

TURKEY CREEK LANDFILL

JOHNSON COUNTY, TEXAS

I/IIB-203

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REVIEWED BY:	JKW
DATE:	3/25/2021
FILE:	None
CAD:	PeteTemplates_TX
FIGURE	3

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- USDA Soils Map Units
- 12.7 Acre Expansion Area
- 12.8 Acre Expansion Area
- Site Boundary
- Limits of Waste

Soil Types within Project Area	
BmE	Birome-Rayex complex, 5 to 20 percent slopes
CrB	Crosstell fine sandy loam, 1 to 3 percent
CrD	Crosstell fine sandy loam, 3 to 8 percent
FHC	Ferris-Heiden complex, 2 to 5 percent slope
GfC	Gasil fine sandy loam, 3 to 8 percent slopes
Pb	Pits, 0 to 45 percent slopes
Pp	Pulexas fine sandy loam, frequently flooded
SfB	Silstid loamy fine sand, 1 to 3 percent slopes
SfD	Silstid loamy fine sand, 3 to 8 percent slopes
Tn	Tinn clay, 0 to 1 percent slopes, frequently flooded
W	Water

N

0 400 800 1,600

1:9,600

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SOILS MAP

TURKEY CREEK LANDFILL

JOHNSON COUNTY, TEXAS

I/IIB-204

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FIGURE	4

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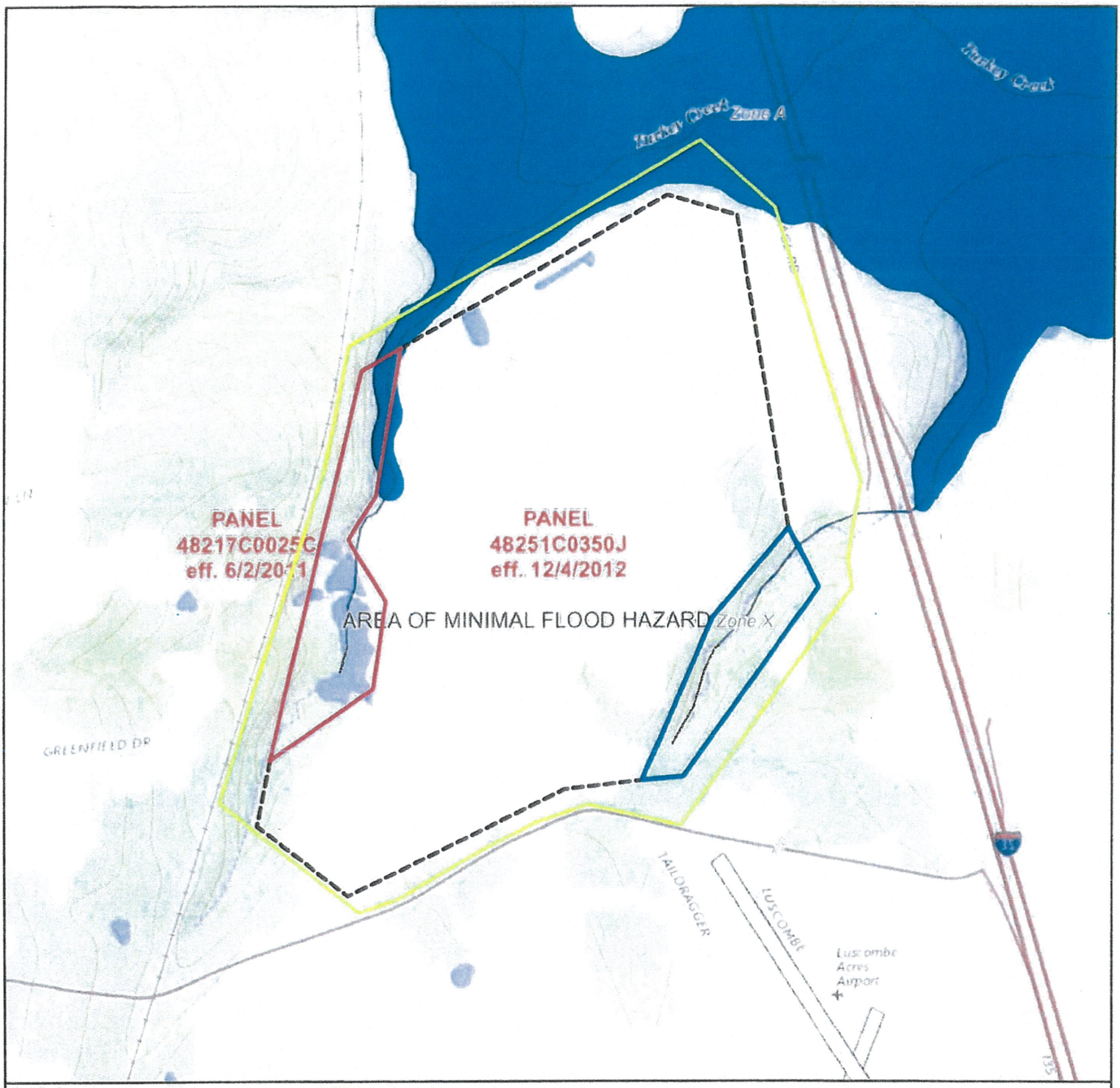

12.7 Acre Expansion Area

12.8 Acre Expansion Area

Site Boundary

Limits of Waste

Flood Hazard Zones

1% Annual Chance Flood Hazard

Regulatory Floodway

Special Floodway

Area of Undetermined Flood Hazard

0.2% Annual Chance Flood Hazard

Future Conditions 1% Annual Chance Flood Hazard

Area with Reduced Risk Due to Levee

N

0 400 800 1,600

1:9,600

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FLOODPLAIN MAP

TURKEY CREEK LANDFILL

JOHNSON COUNTY, TEXAS

I/IIB-205

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FIGURE	5

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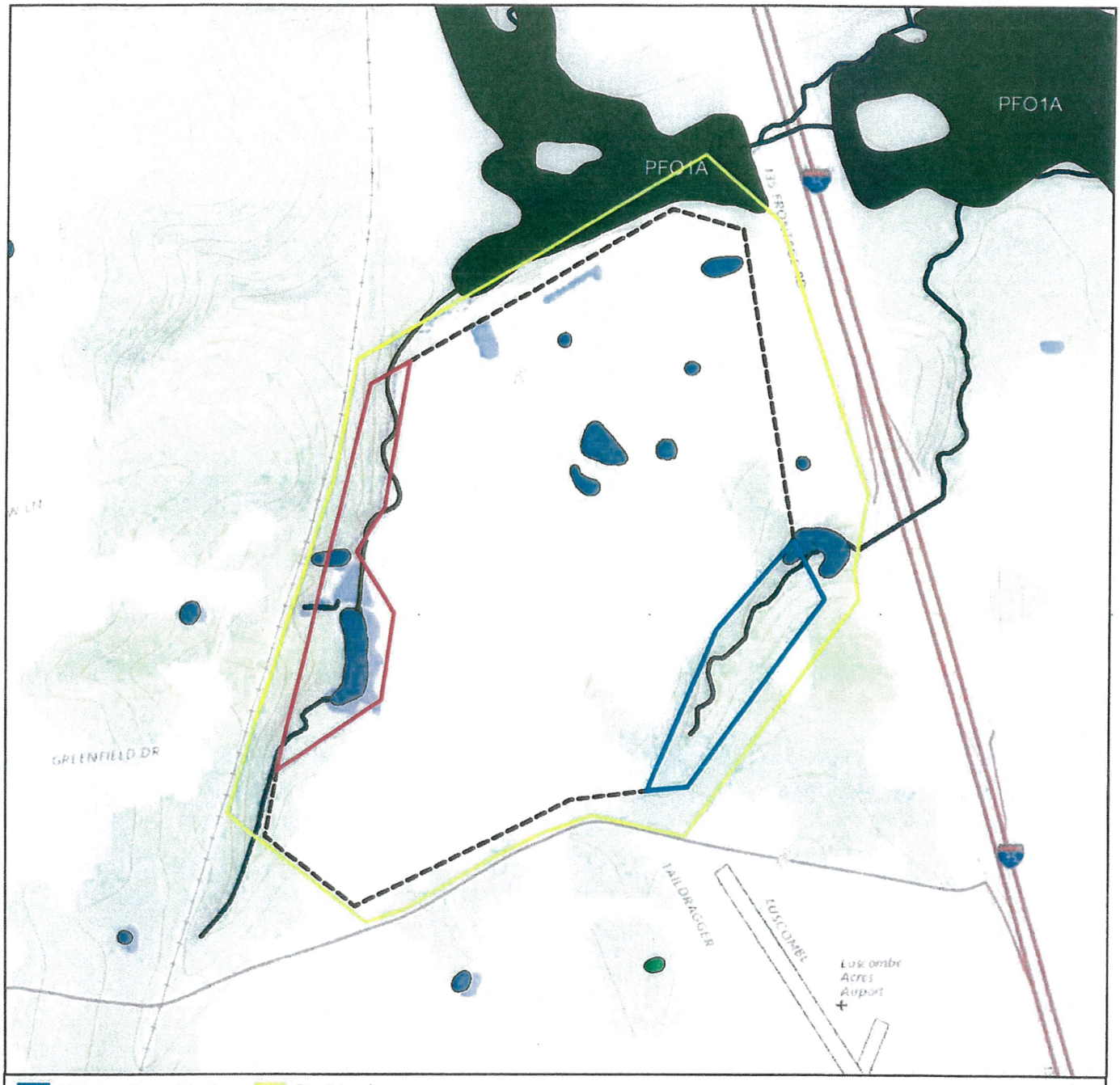

12.7 Acre Expansion Area
12.8 Acre Expansion Area
Site Boundary
Limits of Waste

US FWS Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

N

0 400 800 1,600

1:9,600

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NATIONAL WETLANDS INVENTORY

TURKEY CREEK LANDFILL

JOHNSON COUNTY, TEXAS

I/IIB-206

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FILE:	None
CAD:	PeteTemplates_TX
FIGURE	6

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Pond
Stream
12.7 Acre Expansion Area
12.8 Acre Expansion Area
Site Boundary
Limits of Waste

N

0 400 800 1,600

1:9,600

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WATERS OF THE US

TURKEY CREEK LANDFILL

JOHNSON COUNTY, TEXAS

I/IIB-207

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FILE:	None
CAD:	PeteTemplates_TX

FIGURE 7

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ATTACHMENT C

PHOTOGRAPHS



Photo 1 – View of the southern stream looking east from the western end of the south expansion area.



Photo 2 – Rock outcrop along south stream.



Photo 3 – Rock outcrop along south stream.



Photo 4 – View of south stream looking west toward western endpoint.



Photo 5 – View of south stream looking east.



Photo 6 – View of south stream looking east.



Photo 7 – View of south stream looking east.



Photo 8 – View of south stream as it transitions to beaver pond.



Photo 9 – Western end of beaver pond.



Photo 10 – Upper beaver dam.



Photo 11 – Western end of beaver pond.



Photo 12 – Beaver dam.



Photo 13 – View from second beaver dam looking east.



Photo 14 – View of beaver pond looking east. I-35 and CR 107 bridge in background.



Photo 15 – View of easternmost beaver dam.



Photo 16 – View of easternmost beaver dam.



Photo 17 – View of west stream looking north from the southern endpoint.



Photo 18 – View of west stream looking north.



Photo 19 – Typical view of the west stream looking north.

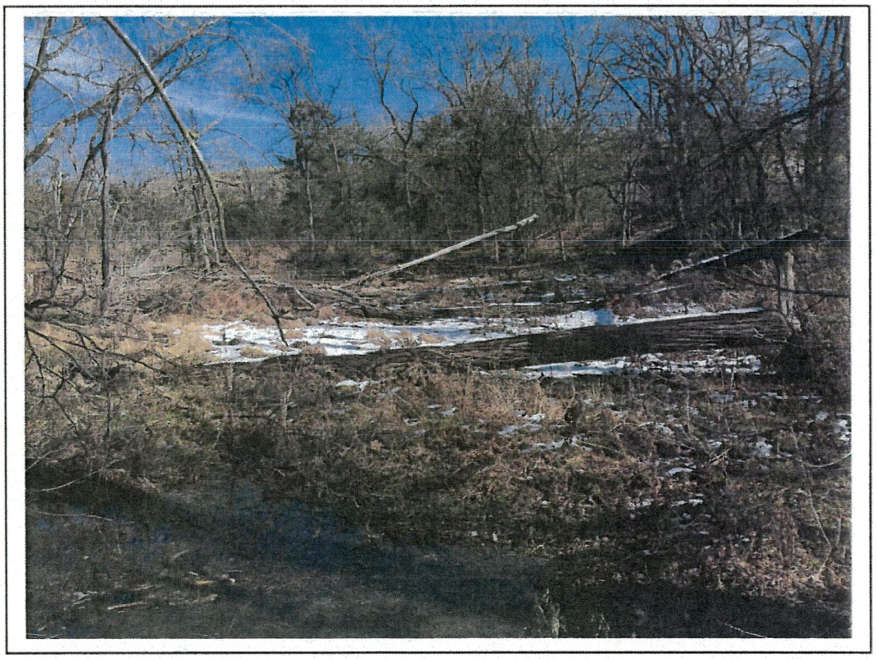

Photo 20 – View of west stream as it transitions to south beaver pond.



Photo 21 – View of south beaver pond looking south.



Photo 22 – View of south beaver pond looking northeast.



Photo 23 – View of south pond dam looking east.

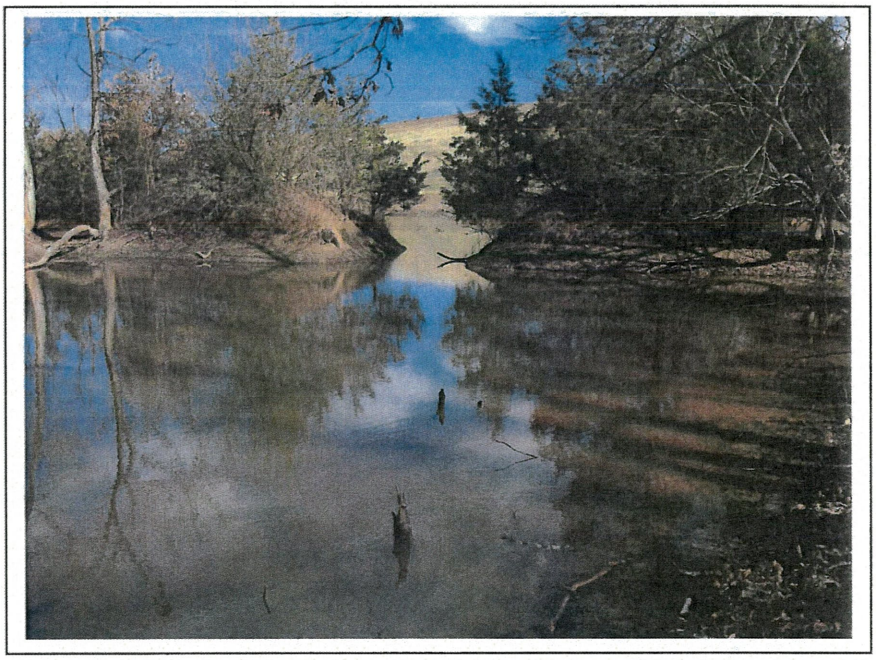

Photo 24 – View of breach in dam of north pond.

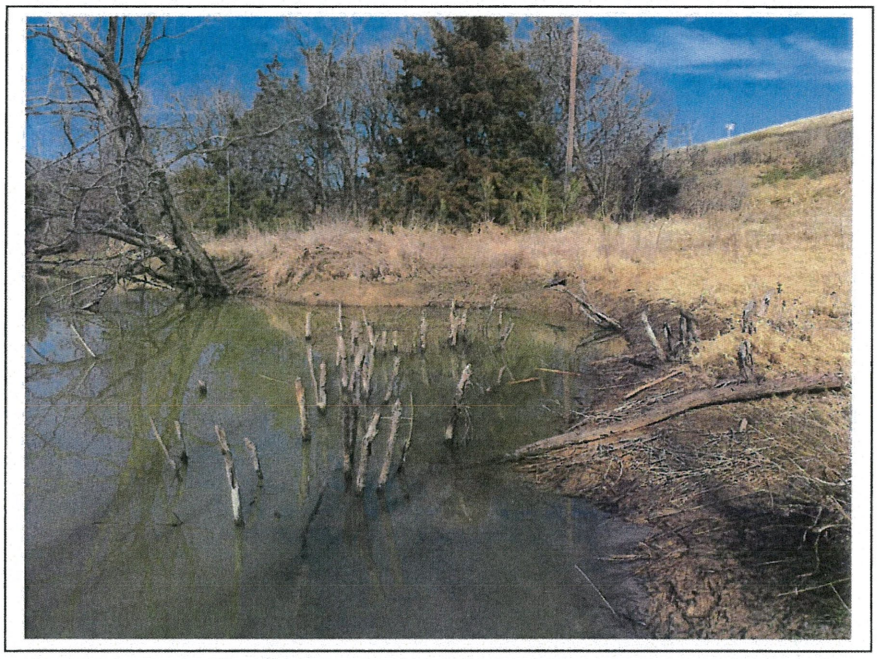

Photo 25 – View of east end of north pond. Remnants of beaver activity.



Photo 26 – Typical view of western ponds.



Photo 27 – View of southern end of western stream looking north.



Photo 28 – View of western stream looking north.



Photo 29 – View of western stream looking north.



Photo 30 – View of western stream looking north.



Photo 31 – View of western stream looking north.



Photo 32 – View of western stream looking north.

ATTACHMENT D

HISTORICAL AERIALS AND TOPOGRAPHIC MAPS

ENVIROSITE Corporation

Historical Aerial Photo Report | 2021

Order Number: 49181
Report Generated: 01/08/2021

Project Name: Turkey Creek Landfill
Project Number:

Turkey Creek Landfill
9100 S Interstate 35 W
Alvarado, TX, 76009

---

2 Corporate Dr
Suite 450
Shelton, CT 06484
Toll Free: 866-211-2028
www.envirositecorp.com

Historical Aerial Photo Report **2021**

Envirosite's Historical Aerial Photo Report is designed to assist in evaluating a subject property resulting from past activities. Envirosite's Historical Aerial Photo Report includes a search of available historical aerial photographs, dating back to the 1930s, or earliest available photographs.

ENVIROSITE SEARCHED SOURCES

SUBJECT PROPERTY:

Turkey Creek Landfill
9100 S Interstate 35 W
Alvarado, TX, 76009

YEAR:	***SCALE:***	***SOURCE:***
1953	1" = 1,000'	U.S.G.S
1981	1" = 1,000'	NHAP
1982	1" = 1,000'	U.S.G.S
1990	1" = 1,000'	NAPP
1995	1" = 500'	DOQ
2001	1" = 500'	U.S.D.A
2003	1" = 500'	U.S.D.A
2007	1" = 500'	U.S.D.A
2010	1" = 500'	NAIP
2012	1" = 500'	NAIP
2014	1" = 500'	NAIP
2016	1" = 500'	NAIP
2018	1" = 500'	NAIP

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FLIGHT YEAR:
1953

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Scale: 1" = 1,000'



FLIGHT YEAR:
1981

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Scale: 1" = 1,000'



FLIGHT YEAR:
1982

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Scale: 1" = 1,000'



FLIGHT YEAR:
1990

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Scale: 1" = 1,000'



FLIGHT YEAR:
1995

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Scale: 1" = 500'



FLIGHT YEAR:
2001

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Scale: 1" = 500'



FLIGHT YEAR:
2003

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FLIGHT YEAR:
2007

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FLIGHT YEAR:
2010

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FLIGHT YEAR:
2012

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FLIGHT YEAR:
2014

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FLIGHT YEAR:
2016

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Scale: 1" = 500'



FLIGHT YEAR:
2018

N
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S

Scale: 1" = 500'



ENVIROSITE Corporation

Historical Topographic Map Report | 2021

Order Number: 49181
Report Generated: 01/15/2021

Project Name: Turkey Creek Landfill
Project Number:

Turkey Creek Landfill
9100 S Interstate 35 W
Alvarado, TX 76009

2 Corporate Drive
Suite 450
Shelton, CT 06484
Toll Free: 866-211-2028
www.envirositecorp.com

Envirosite's Historical Topographic Map Report is designed to assist in evaluating a subject property resulting from past activities. Envirosite's Historical Topographic Map Report includes a search of USGS historical topographic maps, dating back to the early 1900s.

TOPOGRAPHIC MAPS FOUND:

	Map Name:	Year:	Revision Year:	Scale:
1.	Grandview	1961	N/R	1 : 24000
2.	Grandview	1961	1978	1 : 24000
3.	Grandview	2010	N/R	1 : 24000
4.	Grandview	2012	N/R	1 : 24000
5.	Grandview	2016	N/R	1 : 24000
6.	Grandview	2019	N/R	1 : 24000

The USGS 7.5 minute series includes scales 1:24,000 / 1:25,000 / 1:31,680. The USGS 15 minute series includes scales 1:48,000 / 1:62,500 / 1:63,360. The USGS 30x60 minute series scale is 1:100,000.

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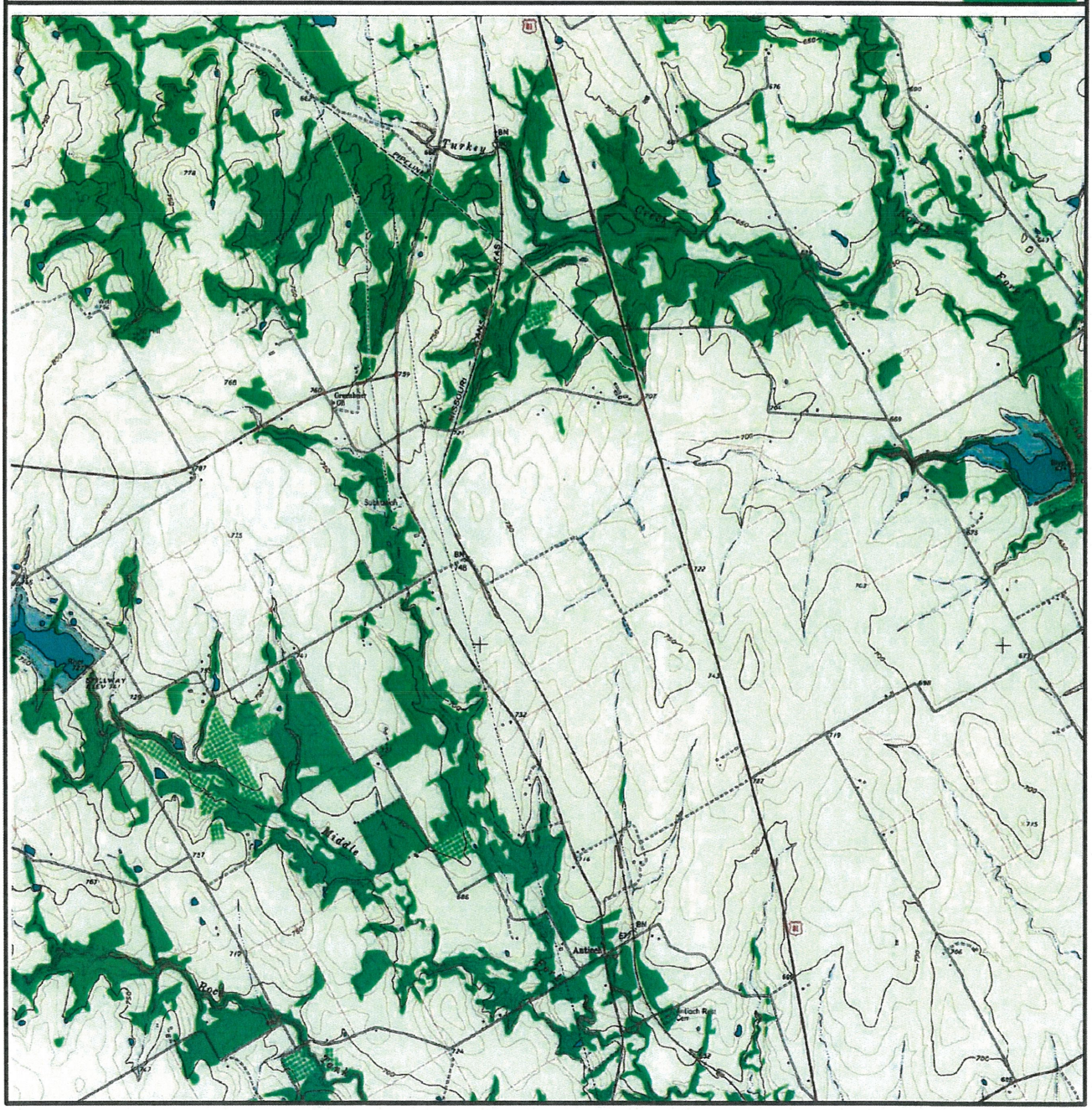
Historical Topographic Map **2021**

SUBJECT NAME: Turkey Creek Landfill	PREPARED FOR: Weaver Consultants Group- TX
ADDRESS: 9100 S Interstate 35 W, Alvarado, TX, 76009	ORDER #: 49181
LAT/LONG: 32.354207 / -97.203100	REPORT DATE: 01/15/2021

SUBJECT QUAD:

MAP NAME:	Grandview	MAP YEAR:	1961	REVISION YEAR:	N/R
SCALE:	1 : 24000	Part	1		



Historical Topographic Map **2021**

SUBJECT NAME: Turkey Creek Landfill
ADDRESS: 9100 S Interstate 35 W, Alvarado, TX, 76009
LAT/LONG: 32.354207 / -97.203100

PREPARED FOR: Weaver Consultants Group- TX
ORDER #: 49181
REPORT DATE: 01/15/2021

SUBJECT QUAD:

MAP NAME:	Grandview	MAP YEAR:	1961	REVISION YEAR:	1978
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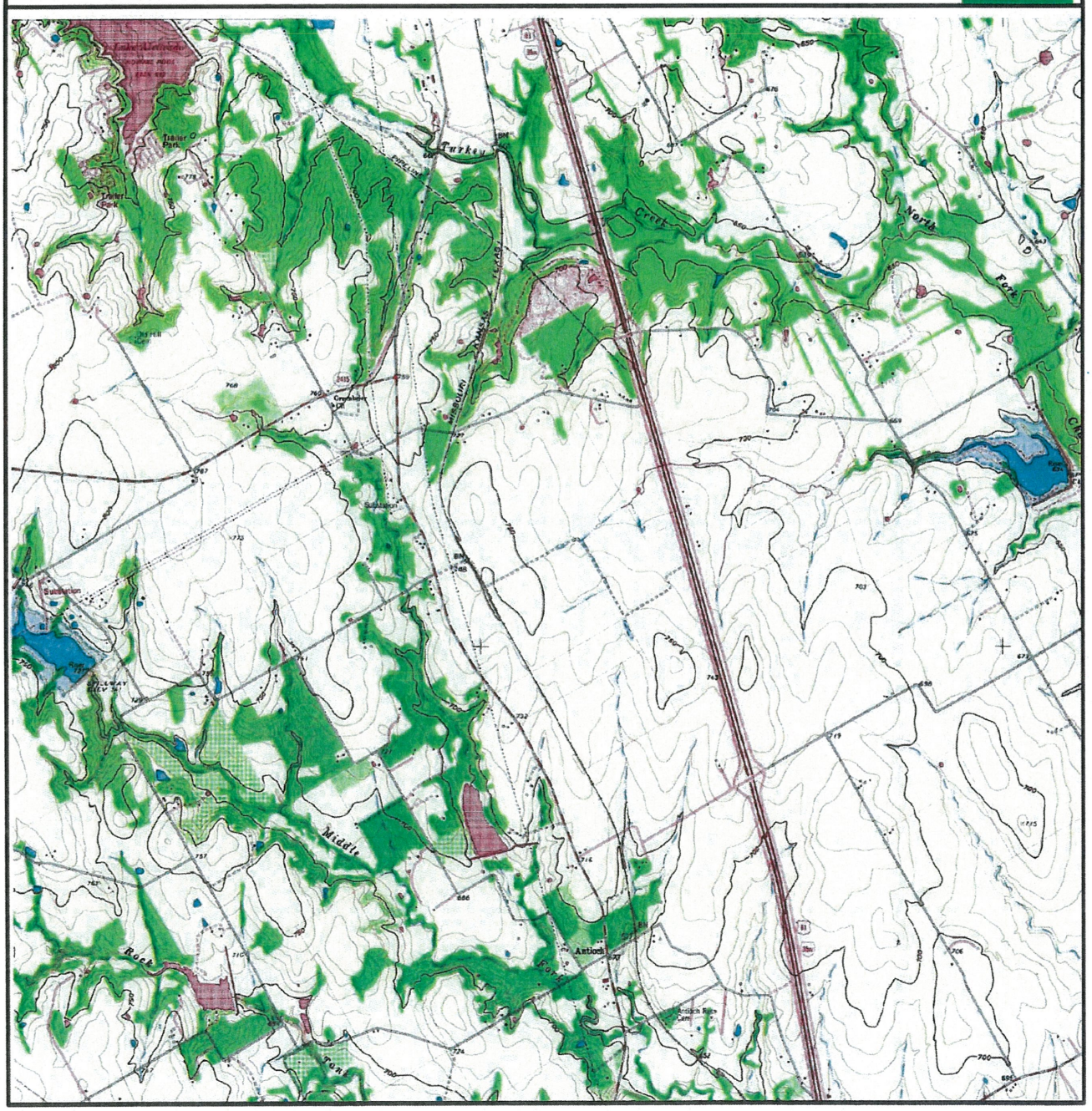


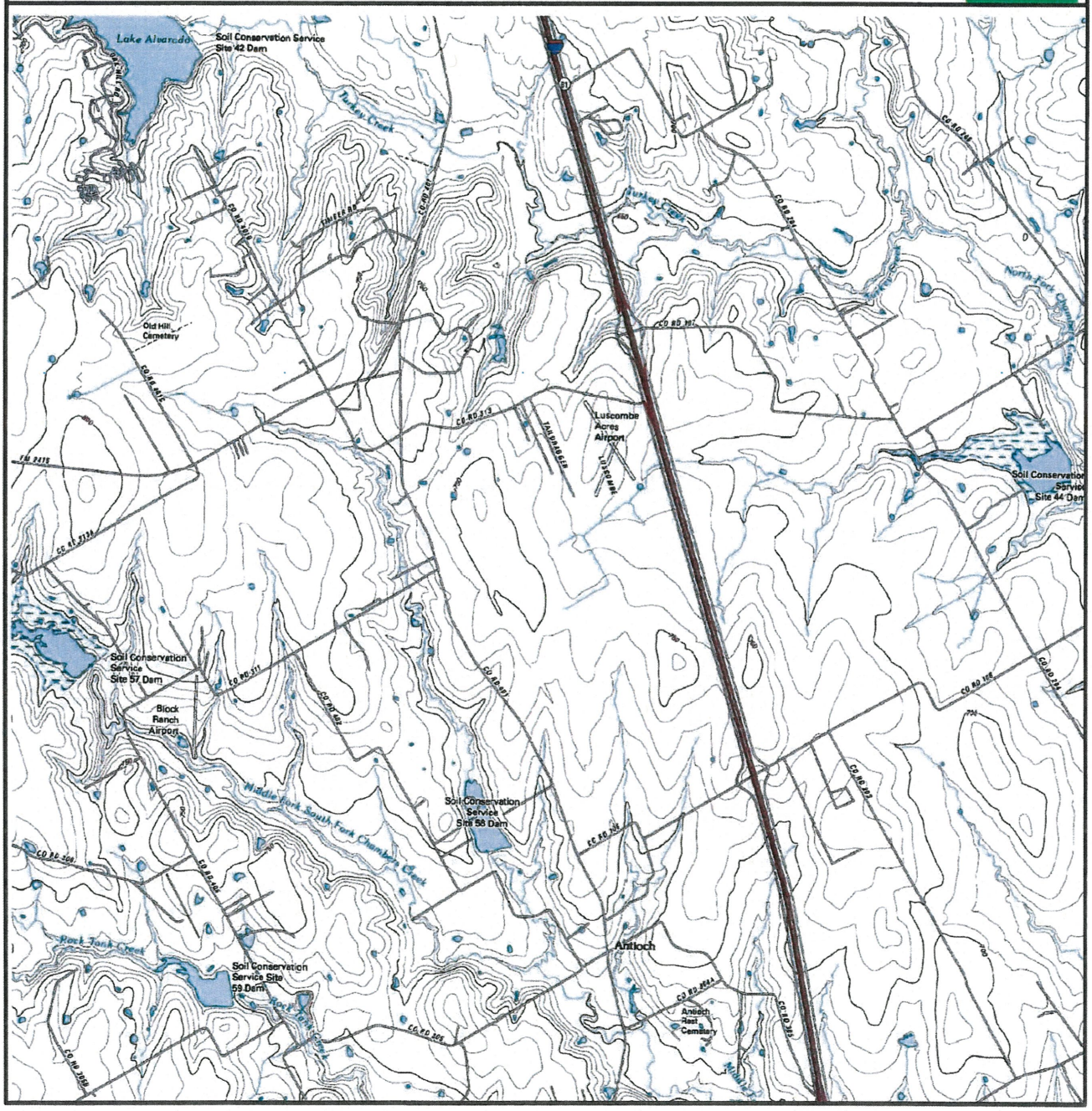
Historical Topographic Map **2021**

SUBJECT NAME: Turkey Creek Landfill
ADDRESS: 9100 S Interstate 35 W, Alvarado, TX, 76009
LAT/LONG: 32.354207 / -97.203100

PREPARED FOR: Weaver Consultants Group- TX
ORDER #: 49181
REPORT DATE: 01/15/2021

SUBJECT QUAD:

MAP NAME:	Grandview	MAP YEAR:	2010	REVISION YEAR:	N/R
SCALE:	1 : 24000	Part	1		



Historical Topographic Map **2021**

SUBJECT NAME: Turkey Creek Landfill
ADDRESS: 9100 S Interstate 35 W, Alvarado, TX, 76009
LAT/LONG: 32.354207 / -97.203100

PREPARED FOR: Weaver Consultants Group- TX
ORDER #: 49181
REPORT DATE: 01/15/2021

SUBJECT QUAD:

MAP NAME:	Grandview	MAP YEAR:	2012	REVISION YEAR:	N/R
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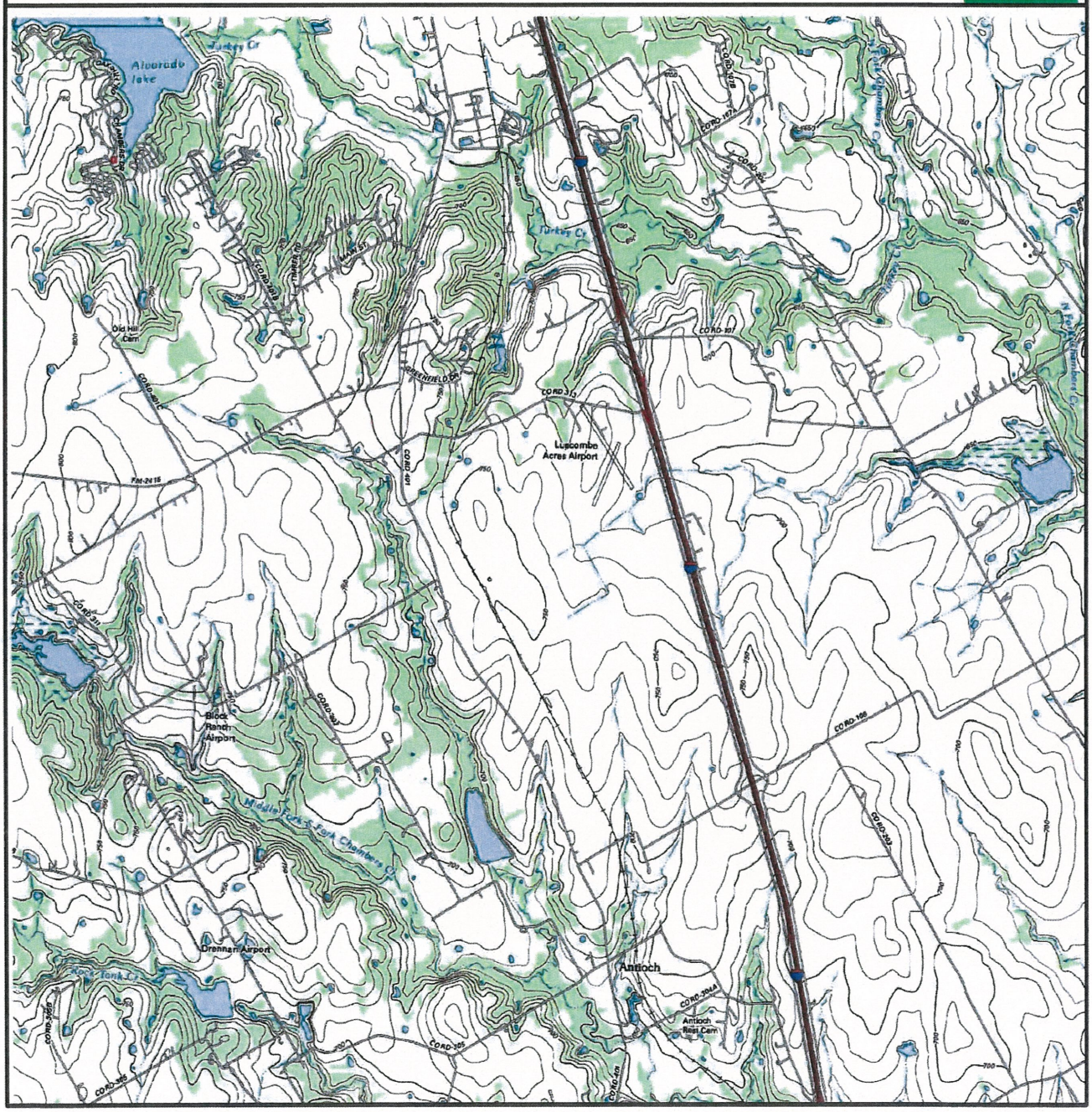

Historical Topographic Map **2021**

SUBJECT NAME: Turkey Creek Landfill	PREPARED FOR: Weaver Consultants Group- TX
ADDRESS: 9100 S Interstate 35 W, Alvarado, TX, 76009	ORDER #: 49181
LAT/LONG: 32.354207 / -97.203100	REPORT DATE: 01/15/2021

SUBJECT QUAD:

MAP NAME:	Grandview	MAP YEAR:	2016	REVISION YEAR:	N/R
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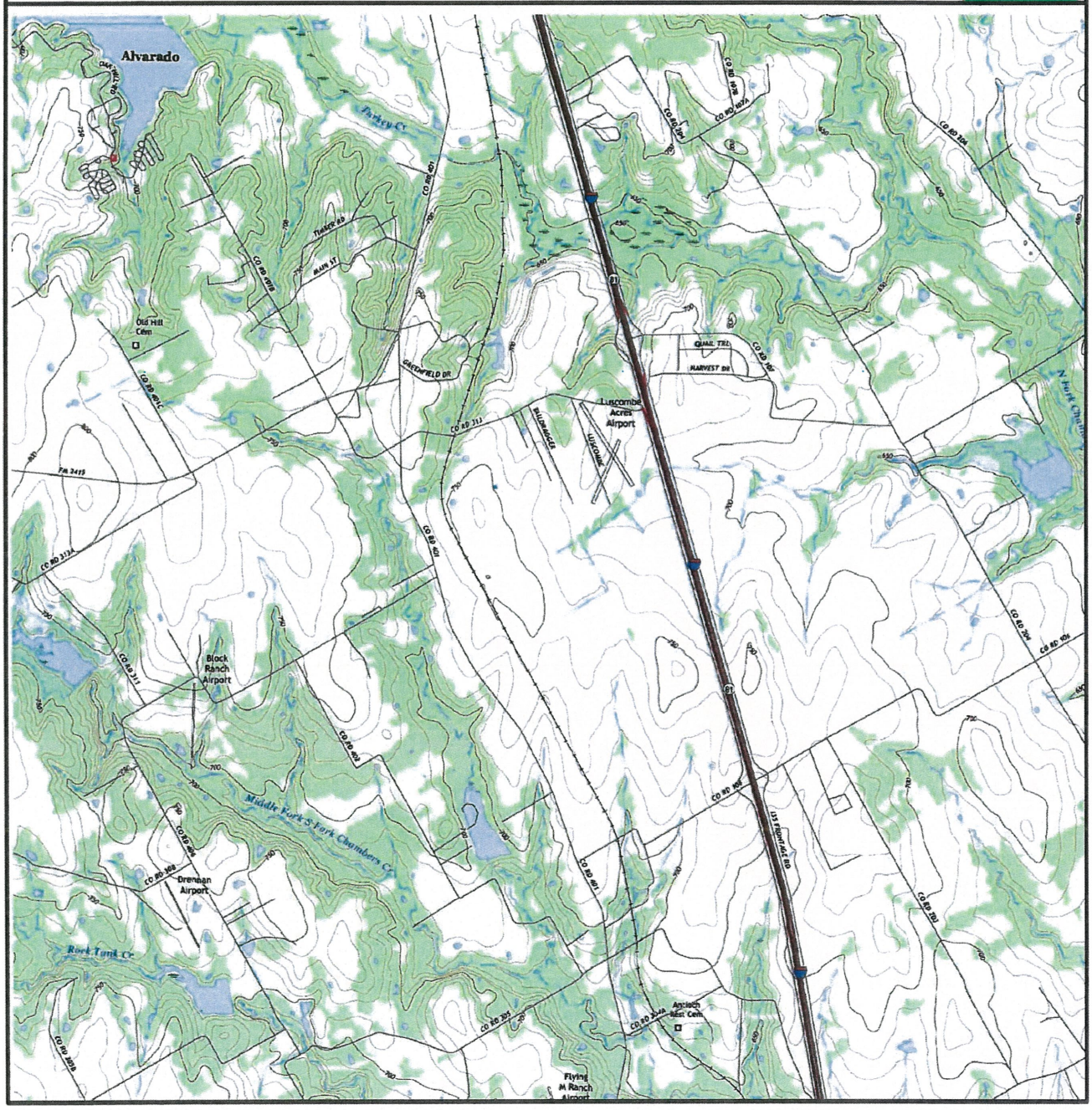

Historical Topographic Map **2021**

SUBJECT NAME: Turkey Creek Landfill
ADDRESS: 9100 S Interstate 35 W, Alvarado, TX, 76009
LAT/LONG: 32.354207 / -97.203100

PREPARED FOR: Weaver Consultants Group- TX
ORDER #: 49181
REPORT DATE: 01/15/2021

SUBJECT QUAD:

MAP NAME:	Grandview	MAP YEAR:	2019	REVISION YEAR:	N/R
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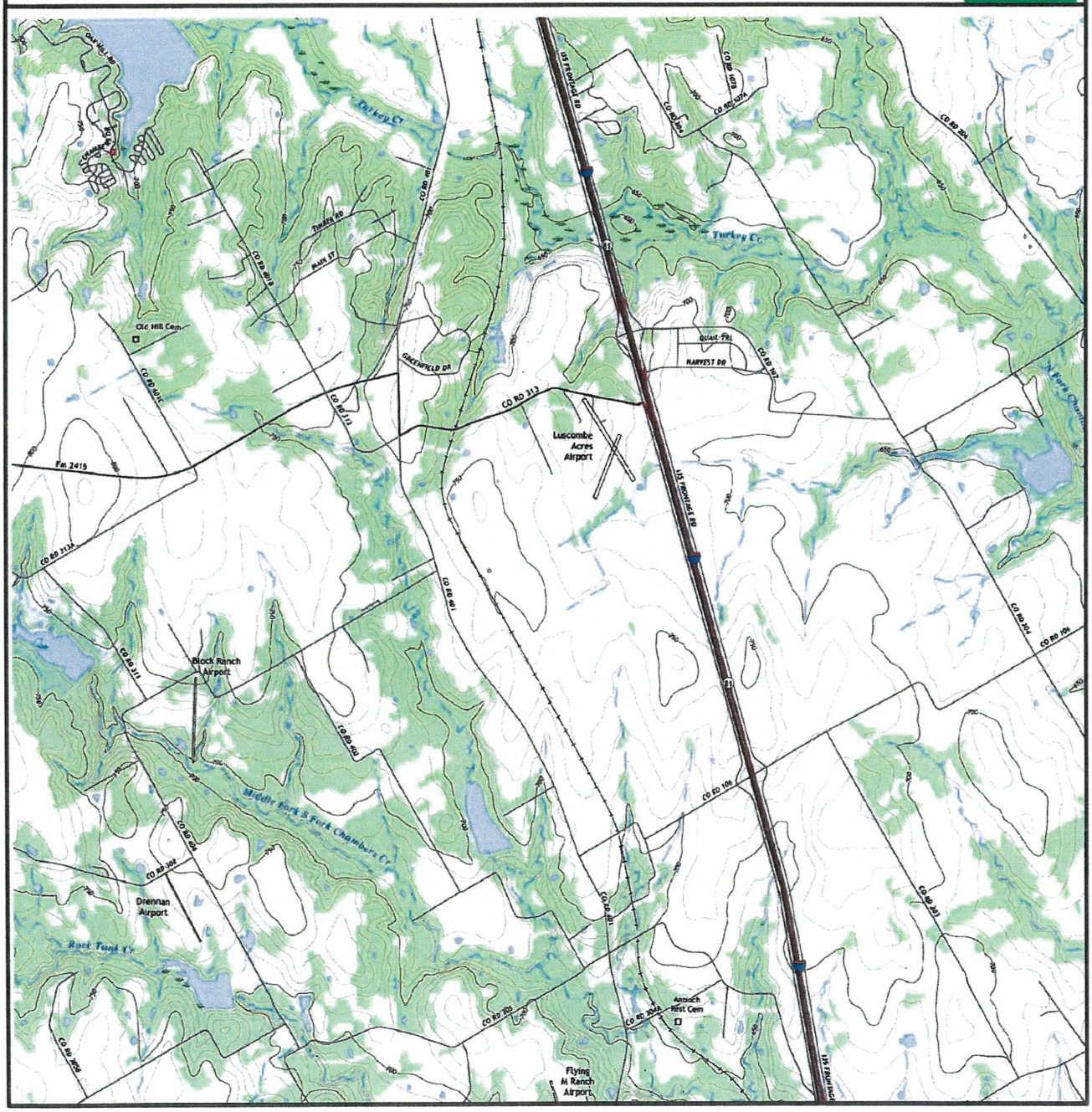

ATTACHMENT E

TABLE 1 – POTENTIAL EFFECTS TO LISTED SPECIES POSSIBLY OCCURRING WITHIN THE PROJECT AREA (JOHNSON COUNTY, TEXAS)

THREATENED & ENDANGERED SPECIES TABLE

TABLE 1
POSSIBLE EFFECTS TO LISTED SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT AREA (JOHNSON COUNTY, TEXAS)

Common Name *(Scientific Name)*	State Status	Federal Status	Description of Suitable Habitat	Unique, Critical, or Designated Habitat	Effects Discussion
Birds					
Golden-cheeked Warbler (*Setophaga chrysoparia*)	E	E	Prefers juniper-oak woodlands and is dependent on mature Ashe juniper with long bark strips	No	No impact; habitat not present
Interior Least Tern (*Sterna antillarum athalassos*)	E	DL	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams and rivers; also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc.); eats small fish and crustaceans; when breeding, forages within a few hundred feet of colony	No	No impact; rare transitory migrant
Red Knot (*Calidris canutus rufa*)	T	T	Prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters	No	No impact; rare transitory migrant
Black Rail *(Laterallus jamaicensis)*	T	T	Occurs in salt, brackish, and freshwater marshes, pond borders, wwet meadows, and grassy swamps.	No	No impact; habitat not present
Piping Plover (*Charadrius melodus*)	T	T	Found on islands along the Texas Gulf Coast, primarily barrier islands. Primary prey for wintering plovers includes polychaete marine worms, various crustaceans, insects, and occasionally bivalve mollusks	No	No impact; rare transitory migrant
White-faced Ibis (*Plegadis chihi*)	T		Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	No	No impact; habitat not present
Whooping Crane (*Grus americana*)	E	E	Potential migrant via plains throughout most of state to coast; winters on coastal marshes	No	No impact; habitat not present
Mollusks					
Brazos heelsplitter (*Potamilus streckersoni*)	T		Reported from streams but not far into the headwaters. Typically found in standing to slow-flowing water in soft substrates consisting of silt, mud or sand.	No	No impact; habitat not present

TABLE 1 POSSIBLE EFFECTS TO LISTED SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT AREA (JOHNSON COUNTY, TEXAS)					
Common Name ***(Scientific Name)***	**State Status**	**Federal Status**	**Description of Suitable Habitat**	**Unique, Critical, or Designated Habitat**	**Effects Discussion**
Texas fawnfoot (*Truncilla macrodon*)	T		This species occurs in the Brazos and Colorado river basins; prefers sand and gravel substrates and can include bank habitats and occasional backwaters; presumed host is freshwater drum	No	No impact; habitat not present
Reptiles					
Brazos Water Snake (*Nerodia harteri*)	T		Occurs in the upper Brazos River drainage basin; prefers riffles in shallow water with rocky bottoms and rocky portions of banks	No	No impact; habitat not present
Texas Horned Lizard (*Phrynosoma cornutum*)	T		Open, arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush, or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive	No	No impact

Note: E – Endangered
T – Threatened
DL – Delisted Taxon, recovered, being monitored first five years

Last Update: 6/22/2021

JOHNSON COUNTY

AMPHIBIANS

Strecker's chorus frog *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Woodhouse's toad *Anaxyrus woodhousii*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: SU

BIRDS

bald eagle *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B,S3N

black rail *Laterallus jamaicensis*

Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of Salicornia

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

black-capped vireo *Vireo atricapilla*

Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3B

chestnut-collared longspur *Calcarius ornatus*

According to Partners in Flight's Landbird Conservation Plan (2016), this species has a continental decline of 85%. Occurs in open shortgrass settings especially in patches with some bare ground. Also occurs in grain sorghum fields and Conservation Reserve Program lands

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

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JOHNSON COUNTY

BIRDS

Franklin's gull *Leucophaeus pipixcan*

This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

golden-cheeked warbler *Setophaga chrysoparia*

Ashe juniper in mixed stands with various oaks (Quercus spp.). Edges of cedar brakes. Dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S2S3B

interior least tern *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: DL: Delisted	State Status: E	SGCN: N
Endemic: N	Global Rank: G4T3Q	State Rank: S1B

lark bunting *Calamospiza melanocorys*

According to Partners in Flight's Landbird Conservation Plan (2016), this species has a continental decline of 86%. Overall, it's a generalist in most short grassland settings including ones with some brushy component plus certain agricultural lands that include grain sorghum. Short grasses include sideoats and blue gramas, sand dropseed, prairie junegrass (Koeleria), buffalograss also with patches of bluestem and other mid-grass species. This bunting will frequent smaller patches of grasses or disturbed patches of grasses including rural yards. It also uses weedy fields surrounding playas. This species avoids urban areas and cotton fields.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

mountain plover *Charadrius montanus*

Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

piping plover *Charadrius melodus*

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JOHNSON COUNTY

BIRDS

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

rufa red knot *Calidris canutus rufa*

Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (Donax spp.) on beaches and dwarf surf clam (Mulinia lateralis) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4T2	State Rank: S2N

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S2

white-faced ibis *Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

whooping crane *Grus americana*

Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1N

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JOHNSON COUNTY

FISH

Mississippi silvery minnow *Hybognathus nuchalis*

Found in eastern Texas streams, from the Brazos River eastward and northward to the Red River; found in moderate current; silty, muddy, or rocky substrate. In Texas, adults likely to inhabit smaller tributary streams.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G5	State Rank: S4

INSECTS

a caddisfly *Neotrichia juani*

Specimens were collected from perennial and ephemeral rivers, and small spring-fed streams (Harris and Tiemann 1993).

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G1	State Rank: S1

American bumblebee *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G3G4	State Rank: SNR

MAMMALS

big brown bat *Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

black-tailed prairie dog *Cynomys ludovicianus*

Dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

cave myotis bat *Myotis velifer*

Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (Hirundo pyrrhonota) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S2S3

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JOHNSON COUNTY

MAMMALS

eastern red bat *Lasiurus borealis*

Red bats are migratory bats that are common across Texas. They are most common in the eastern and central parts of the state, due to their requirement of forests for foliage roosting. West Texas specimens are associated with forested areas (cottonwoods). Also common along the coastline. These bats are highly mobile, seasonally migratory, and practice a type of "wandering migration". Associations with specific habitat is difficult unless specific migratory stopover sites or wintering grounds are found. Likely associated with any forested area in East, Central, and North Texas but can occur statewide.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

eastern spotted skunk *Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S3

hoary bat *Lasiurus cinereus*

Hoary bats are highly migratory, high-flying bats that have been noted throughout the state. Females are known to migrate to Mexico in the winter, males tend to remain further north and may stay in Texas year-round. Commonly associated with forests (foliage roosting species) but are found in unforested parts of the state and lowland deserts. Tend to be captured over water and large, open flyways.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

long-tailed weasel *Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

mountain lion *Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

Muskrat *Ondatra zibethicus*

Found in fresh or brackish marshes, lakes, ponds, swamps, and other bodies of slow-moving water. Most abundant in areas with cattail. Dens in bank burrow or conical house of vegetation in shallow vegetated water. It is primarily found in the Rio Grande near El Paso and in SE Texas in the Houston area.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

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JOHNSON COUNTY

MAMMALS

swamp rabbit *Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

tricolored bat *Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S3S4

western hog-nosed skunk *Conepatus leuconotus*

Habitats include woodlands, grasslands & deserts, to 7200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. telmalestes

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

MOLLUSKS

Brazos Heelsplitter *Potamilus streckersoni*

Reported from streams, but not far into the headwaters, to large rivers, and some reservoirs. In riverine systems occurs most often in nearshore habitats such as banks and backwater pools but occasionally in mainchannel habitats such as riffles. Typically found in standing to slow-flowing water in soft substrates consisting of silt, mud or sand but occasionally in moderate flows with gravel and cobble substrates (Randklev et al. 2014b,c; Tsakiris and Randklev 2016b; Smith et al. 2019) [Mussels of Texas 2020]

Federal Status:	State Status: T	SGCN: Y
Endemic: Y	Global Rank: GNR	State Rank: SNR

Texas Fawnsfoot *Truncilla macrodon*

Occurs in large rivers but may also be found in medium-sized streams. Is found in protected near shore areas such as banks and backwaters but also riffles and point bar habitats with low to moderate water velocities. Typically occurs in substrates of mud, sandy mud, gravel and cobble. Considered intolerant of reservoirs (Randklev et al. 2010; Howells 2010o; Randklev et al. 2014b,c; Randklev et al. 2017a,b). [Mussels of Texas 2019]

Federal Status: C	State Status: T	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S2

REPTILES

Brazos water snake *Nerodia harteri*

Aquatic: Shallow, fast-flowing water with a rocky or gravelly substrate preferred. Adults can be found in deep water with mud bottoms, such as large section fo rivers and reservoirs. Riffle habitat is particularly important for this species.

Federal Status:	State Status: T	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

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JOHNSON COUNTY

REPTILES

eastern box turtle *Terrapene carolina*

Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Prairie Skink *Plestiodon septentrionalis*

The prairie skink can occur in any native grassland habitat across the Rolling Plains, Blackland Prairie, Post Oak Savanna and Pineywoods ecoregions.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

slender glass lizard *Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

smooth softshell *Apalone mutica*

Aquatic: Large rivers and streams; in some areas also found in lakes and impoundments (Ernst and Barbour 1972). Usually in water with sandy or mud bottom and few aquatic plants. Often basks on sand bars and mudflats at edge of water. Eggs are laid in nests dug in high open sandbars and banks close to water, usually within 90 m of water (Fitch and Plummer 1975).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Texas garter snake *Thamnophis sirtalis annectens*

Terrestrial and aquatic: Habitats used include the grasslands and modified open areas in the vicinity of aquatic features, such as ponds, streams or marshes. Damp soils and debris for cover are thought to be critical.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G5T4	State Rank: S1

Texas horned lizard *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

western box turtle *Terrapene ornata*

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JOHNSON COUNTY

REPTILES

Terrestrial: Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

western massasauga *Sistrurus tergeminus*

Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3S4

PLANTS

Hall's prairie clover *Dalea hallii*

In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S2

Reverchon's scurfpea *Pediomelum reverchonii*

Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; Perennial; Flowering Jun-Sept; Fruiting June-July

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Texas milk vetch *Astragalus reflexus*

Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

tree dodder *Cuscuta exaltata*

Parasitic on various Quercus, Juglans, Rhus, Vitis, Ulmus, and Diospyros species as well as Acacia berlandieri and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

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IPaC **U.S. Fish & Wildlife Service**

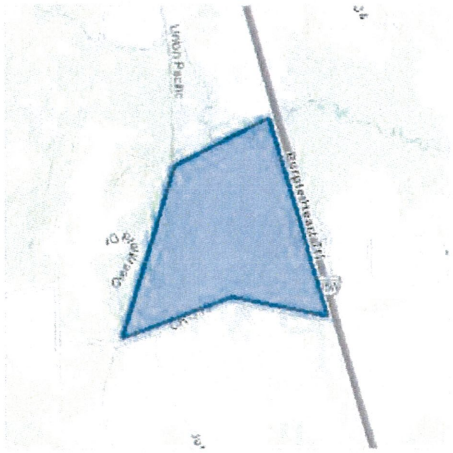
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Johnson County, Texas



Local office

Arlington Ecological Services Field Office

(817) 277-1100
(817) 277-1129

2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247

http://www.fws.gov/southwest/es/arlingtontexas/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS

Golden-cheeked Warbler (=wood) Dendroica chrysoparia — Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/33

Piping Plover Charadrius melodus — Threatened
This species only needs to be considered if the following condition applies:
- Wind Energy Projects

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/6039

Red Knot Calidris canutus rufa — Threatened
Wherever found
This species only needs to be considered if the following condition applies:
- Wind Energy Projects

There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/1864

Whooping Crane Grus americana — Endangered
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/758

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

Red-headed Woodpecker Melanerpes erythrocephalus Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (▪)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

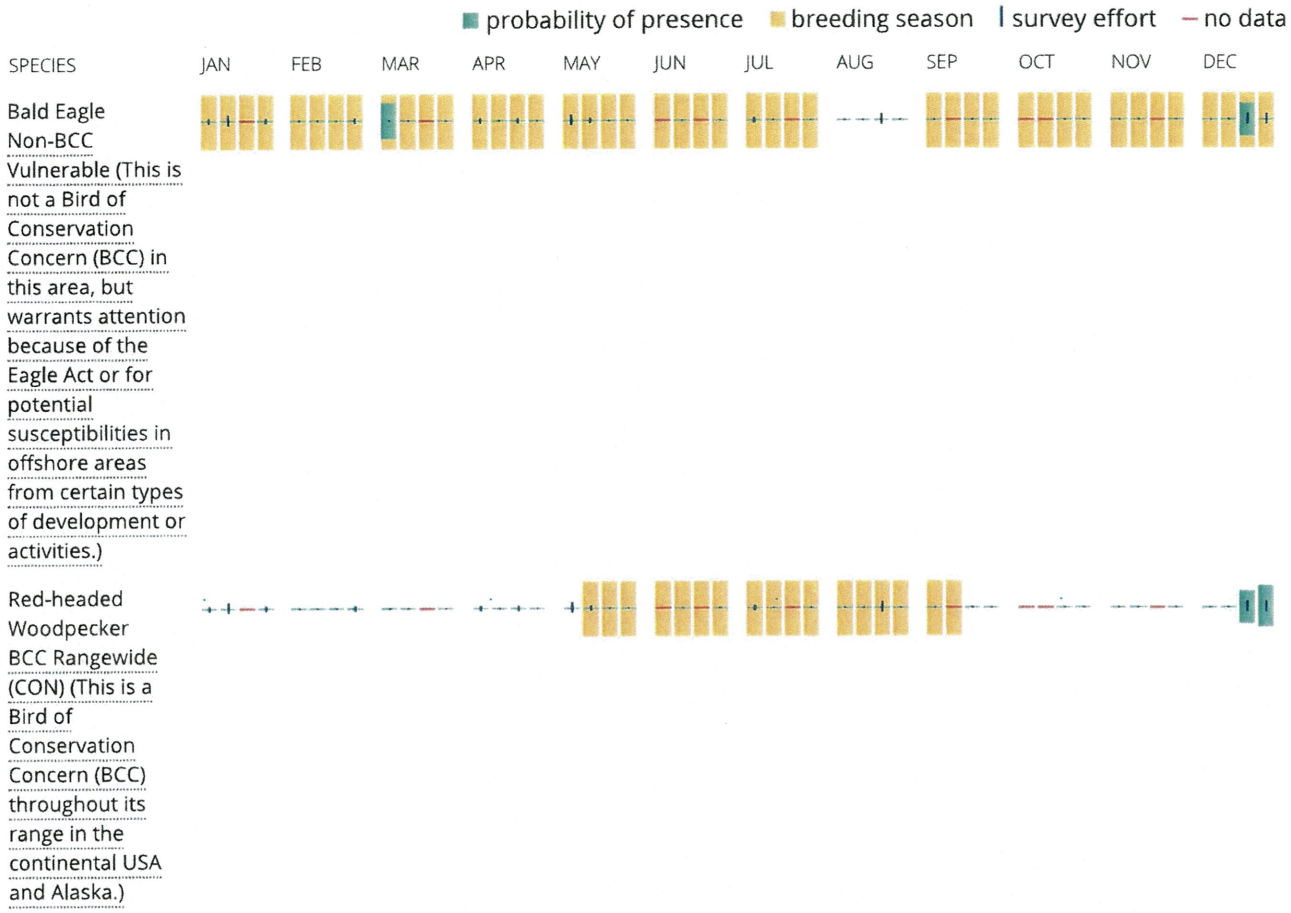
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

COORDINATION WITH
U.S. DEPARTMENT OF THE INTERIOR,
FISH AND WILDLIFE SERVICE

- February 18, 2022 FWS Approval Email.
- January 18, 2022 WCG Request for Review Letter dated.

Puhr, Johnna

From: Puhr, Johnna
Sent: Wednesday, February 23, 2022 10:24 AM
To: Puhr, Johnna
Subject: FW: [EXTERNAL] RE: Turkey Creek Landfill Expansion

Johnna Puhr
Project Engineer

Weaver Consultants Group
6420 Southwest Blvd. | Suite 206
Fort Worth, TX 76109
O: 817-735-9770 | F: 917-735-9775
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From: Althouse, Melissa A <melissa_althouse@fws.gov>
Sent: Friday, February 18, 2022 1:20 PM
To: Marsh, Chuck <cmarsh@wcgrp.com>
Subject: Re: [EXTERNAL] RE: Turkey Creek Landfill Expansion

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hello Chuck,

Yes, consultation is now complete. Please let us know if any of the conditions for re-evaluation are triggered (found near the top of page 2 in the letter). Thank you for your consideration of federally listed species in developing your project.

Regards,

Melissa Althouse
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
2005 NE Green Oaks Blvd, Suite 140
Arlington, Texas 76006

Office: (817) 277-1100, ext. 22124
Fax: (817) 277-1129
Arlington ES website

From: Marsh, Chuck <cmarsh@wcgrp.com>
Sent: Friday, February 18, 2022 12:54
To: Althouse, Melissa A <melissa_althouse@fws.gov>
Subject: [EXTERNAL] RE: Turkey Creek Landfill Expansion

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good afternoon Melissa,

We received the attached letter from the IPaC system today. Am I understanding correctly that our coordination with FWS is complete and no further action is required for this project?

Thanks,

Chuck

Charles Marsh, PE
Project Director

Weaver Consultants Group
6420 Southwest Blvd. | Suite 206
Fort Worth, TX 76109
O: 817-735-9770 | F: 817-735-9775
cmarsh@wcgrp.com | www.wcgrp.com



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From: Althouse, Melissa A <melissa_althouse@fws.gov>
Sent: Monday, February 14, 2022 11:36 AM
To: Marsh, Chuck <cmarsh@wcgrp.com>
Subject: Turkey Creek Landfill Expansion

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Dear Mr. Marsh,

We have received your correspondence regarding the expansion of the Turkey Creek municipal solid waste landfill located approximately 2.5 miles south of Alvarado, Texas. To fully evaluate your project with respect to threatened and endangered species, please visit our Information for Planning and Consultation website (IPaC) at https://ecos.fws.gov/ipac/. In addition to finding information on resources of concern for your project area, there is a determination key, which can guide your through an evaluation of the proposed project. The determination key is an up-front analysis for certain project types and species that allows an action agency, or its designated non-federal representative, to initiate a streamlined process for determining a proposed project's potential effects on federally listed species. You can access your existing project 02ETAR00-2021-SLI-2910, Turkey Creek Landfill Expansion within your project home page (though this was created by a 'jpuhr@wcgrp.com', and he may need to be the one to log in), click on 'regulatory review,' and then navigate to 'Evaluate determination keys' under the Endangered Species section. This system will then advise you on the next steps to take, depending on the determination reached.

Kind regards,

Melissa Althouse
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
2005 NE Green Oaks Blvd, Suite 140
Arlington, Texas 76006
Office: (817) 277-1100, ext. 22124
Fax: (817) 277-1129
Arlington ES website

Weaver Consultants Group

January 18, 2022
Project No. 0771-368-11-123

Ms. Debra Bills, Field Supervisor
U.S. Department of the Interior
Fish and Wildlife Service
2005 NE Green Oaks Blvd., Suite 140
Arlington, Texas 76006

Re: Endangered or Threatened Species Assessment
Proposed Turkey Creek Landfill Major Permit Amendment
Johnson County, Texas

Dear Ms. Bills:

The purpose of this letter is to demonstrate coordination with the U.S. Department of the Interior, Fish and Wildlife Service, consistent with Title 30 Texas Administrative Code (TAC) §330.61(n)(2). This regulation requires that a permit applicant for an expansion of a municipal solid waste facility coordinate with the Fish and Wildlife Service regarding compliance with the Endangered Species Act.

Weaver Consultants Group, LLC (WCG) is preparing a permit amendment application, on behalf of Texas Regional Landfill Company, LP to vertically expand the existing municipal solid waste landfill located approximately 2.5 miles south of Alvarado, Texas. The expansion will be limited to a vertical increase in the height of the landfill and will not change the permit boundary or limits of waste disposal included in the current Texas Commission on Environmental Quality (TCEQ) permit. To assist you in your determination regarding threatened or endangered species or their critical habitat within or near the referenced project, please find attached (1) a project summary and site location maps and (2) a site-specific Biological Assessment Report completed by WCG in August 2018.

The site has operated as a landfill for over 35 years, and a significant portion of the area within the landfill permit boundary has been disturbed by earth-moving activities (e.g., landfill operation, soil borrow area operations, etc.). A site specific Threatened and Endangered Species Review was completed in August 2018 by WCG. As discussed in the attached review, the site does not provide habitat for and would not likely be occupied by any federally listed and state listed threatened and endangered species. The WCG report notes that, while it is possible that the migratory bird species may utilize the site during migration, use would be transitory

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in nature and of short duration. Lack of suitable habitat makes the occurrence of the migratory species highly unlikely.

To verify compliance with §330.61(n)(2), we will need to include a review letter from the U.S. Fish and Wildlife Service within the permit application. As discussed in the attached Horizon report, the site is not likely to be occupied by any federal or state-listed species. Therefore, it is requested that the U.S. Fish and Wildlife Service concur with the conclusions made in the attached report.

Your assistance with this matter is sincerely appreciated. Please call if you have any questions or need additional information.

Sincerely,
Weaver Consultants Group, LLC

Charles R. Marsh, P.E.
Project Director

Attachments: Attachment 1 – Project Summary and Site Location Maps
Attachment 2 – Biological Assessment Report

cc: Gary Bartels, Texas Regional Landfill Company, LP

ATTACHMENT 1

PROJECT SUMMARY AND SITE LOCATION MAPS

Project Summary
Turkey Creek Landfill Expansion
Johnson County, Texas

Introduction

Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain authorization for an expansion of the existing Turkey Creek Landfill. This landfill expansion project will provide long-term disposal capacity for municipal solid waste that is generated in the area. The permit application will be submitted to the Texas Commission on Environmental Quality (TCEQ). The application will undergo a detailed review by the TCEQ before the permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed landfill expansion. The following subsections detail information regarding the owner and operator of the site, general site information, and a summary of the proposed site design.

Owner/Operator Information

The Turkey Creek Landfill is owned and operated by Texas Regional Landfill Company, LP (previously IESI TX Landfill, LP), a subsidiary of Waste Connections, Inc. Waste Connections, Inc. is one of the leading providers of solid waste services in the nation and provides services to residential, municipal and commercial customers across the country.

Site Information

The following drawings are attached to this summary.

- Figure 1 – Site Location Map. This drawing shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This drawing shows the existing permitted landfill permit boundary and the limits of disposal area on a USGS map.
- Figure 3 – Aerial Photograph. This figure details the existing permitted landfill permit boundary and limits of waste disposal area on an aerial photograph.
- Figure 4 – Site Plan. This plan highlights the existing permitted landfill permit boundary and the limits of disposal area on a detailed topographic map.
- Figure 5 – Existing and Proposed Landfill Completion Plan. This Plan provides a comparison between the currently permitted landfill and the proposed changes to the landfill completion plan.

Site History

The Turkey Creek Landfill is an existing 219.6-acre municipal solid waste (MSW) landfill (TCEQ Permit No. MSW-1417C) located approximately 2.5 miles south of the City of Alvarado in Johnson County, Texas. The site was originally permitted as a 91-acre Type I MSW disposal facility in 1983 (Permit No. MSW-1417). A permit amendment (MSW-1417A) was issued in 1988 which did not add acreage, but made more efficient use of the permitted area. The permit was amended in 1991 (Permit No. MSW-1417B). This amendment increased the permit boundary to its currently permitted acreage (219.6 acres). The permit was amended again in 2020 (Permit No. MSW-1417C). This amendment increased the height from 834 feet mean sea level (ft-msl) to 946 ft-msl. The currently permitted waste disposal footprint is approximately 146.4 acres.

Design Summary

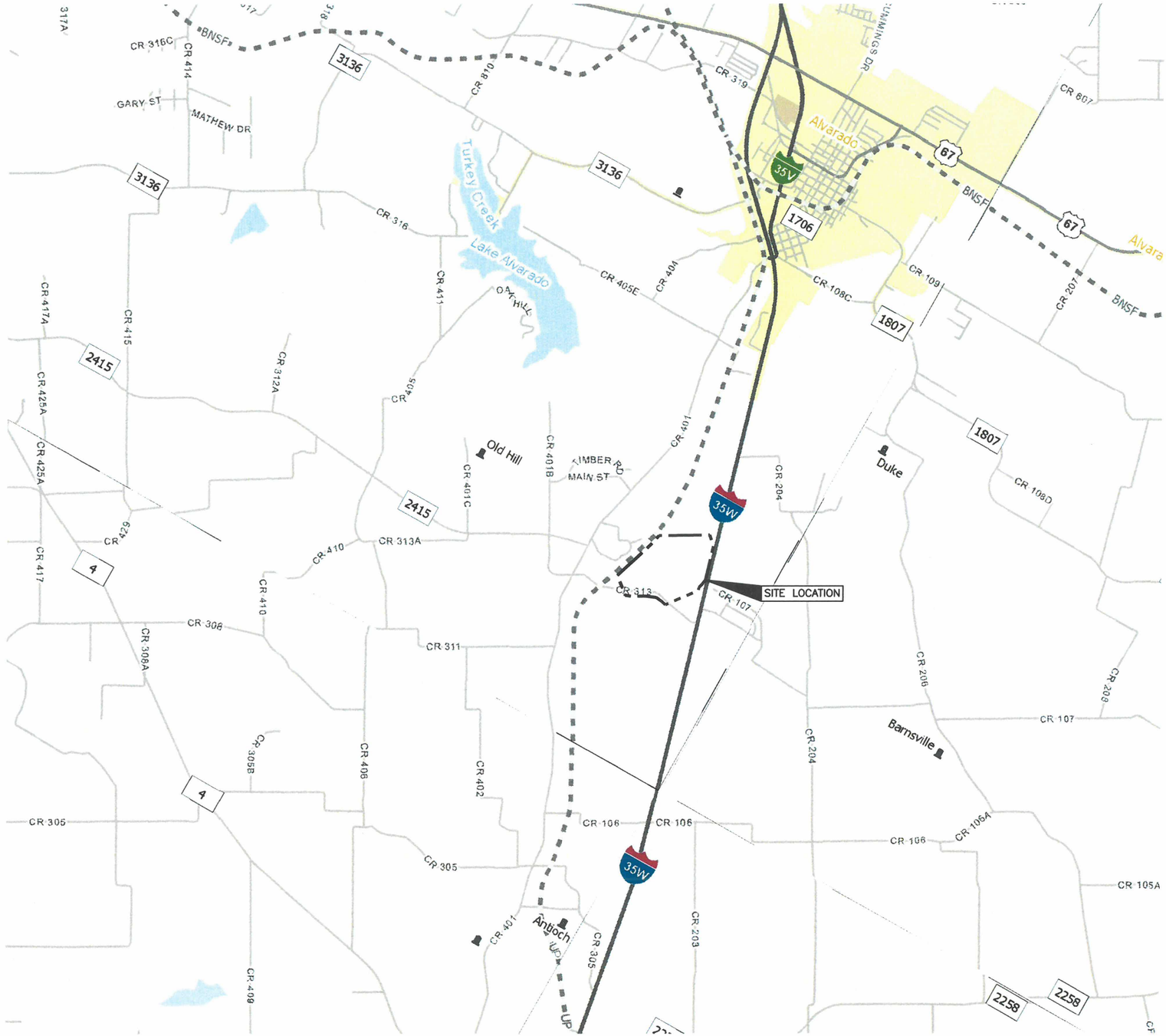
The following information presents a summary of the design and operations of the proposed Turkey Creek Landfill expansion.

- The Turkey Creek Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-1417C). The existing landfill currently serves residences and businesses in the communities of Johnson County and nearby counties.
- With this expansion, the existing 219.6-acre permit boundary footprint will not be expanded. The permitted limits of waste will be expanded from approximately 146.4 acres to approximately 172.0 acres. The current peak elevation of 946 feet mean sea level (msl) will be expanded vertically to 996 feet msl.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the Turkey Creek Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes as approved by TCEQ.
- Access to the site will be provided via the existing site access roads. Based on travel patterns of existing landfill traffic, vehicles bound for the landfill will generally access the site using I-35W and the I-35W frontage road. which is capable of handling the loads associated with landfill traffic.
- A liner and final cover system that meets all regulatory requirements will be used for the solid waste containment system. The design objective of the containment system (final cover, liner, and leachate management systems) is to isolate the solid waste and remove leachate (defined as liquid that has contacted solid waste) that may collect on the liner system. Collected leachate will be stored on-site then transferred to an authorized treatment facility, handled on-site in accordance with the liquid stabilization program, or recirculated to areas with composite liners for use as a compaction aid in the working face. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures,

liner and cover systems follow strict TCEQ-approved quality control procedures, which are performed by a qualified independent licensed professional engineer specialized in landfill construction quality assurance. Each of the containment system components must be thoroughly reviewed and approved by the TCEQ before solid waste is placed in the landfill.

- To control landfill gas (LFG) emissions and minimize the potential for subsurface migration a LFG collection and control system (GCCS) has been installed at the site. The collection system currently consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is conveyed to a nearby plant and converted to energy or conveyed to a LFG flare where it is combusted. The existing LFG system will continued to be expanded to collect LFG from the currently permitted but undeveloped waste fill footprint and the horizontal expansion areas. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control LFG.
- To verify that the highest level of environmental protection is provided, the following landfill monitoring systems are provided:
  - Groundwater Monitoring System. The purpose of the groundwater monitoring system is to verify the integrity of the containment system and verify that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining water samples from the monitor wells located on the perimeter of the landfill, which are screened in the upper most water table. The water samples are tested by an accredited third-party analytical laboratory.
  - LFG Detection System. The purpose of the LFG detection system is to verify that LFG does not migrate off-site. LFG detection probes have been installed along the current permit boundary perimeter.

  Each of these systems are sampled and tested periodically. The results are filed with the TCEQ and are public record.
- Site Operations. The site will be operated by personnel who have been trained and certified by the TCEQ. A detailed site operating plan will be included in the permit amendment application. The plan will detail the required equipment, personnel, and safety procedures required to operate the site in accordance with TCEQ regulations. The active landfill area will be covered at the end of each workday to prevent potential nuisance conditions such as odors and vectors. The Turkey Creek Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.



0 1/2 1
SCALE IN MILES

LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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- [ ] DRAFT
- [X] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 1-SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

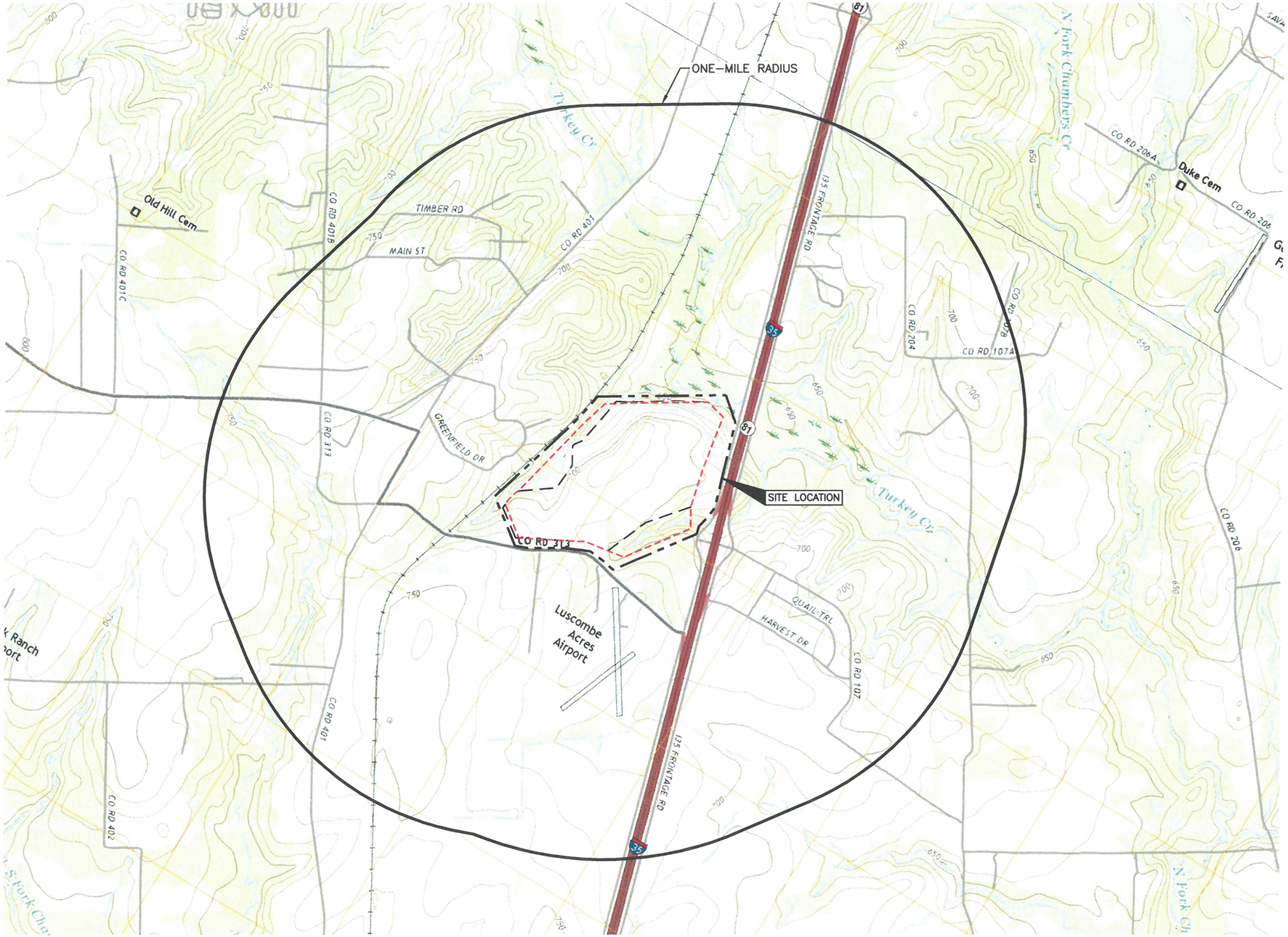
SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

FIGURE 1

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 1-SITE LOCATION MAP.dwg, jpuhr, 1:2



LEGEND

- PROPERTY/PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route / State Route

ALVARADO, TX
2019

GRANDVIEW, TX
2019

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads.....U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2000 - 2018
Contours.....National Elevation Dataset, 2003 - 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 1981

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads.....U.S. Census Bureau, 2015 - 2018
Names.....GNIS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2002 - 2018
Contours.....National Elevation Dataset, 2004
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 1981

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FILE: 0771-368-11
CAD: FIG 2-GENERAL TOPO MAP.DWG
DRAWN BY: SRF
DESIGN BY: DEP
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

GENERAL TOPOGRAPHIC MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2

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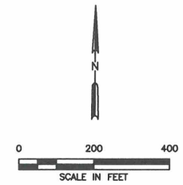
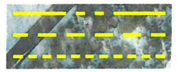
O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 2-GENERAL TOPO MAP.dwg, jpuhr, 1:2





LEGEND



PROPERTY/PERMIT BOUNDARY
PERMITTED LIMITS OF WASTE
PROPOSED LIMITS OF WASTE

NOTES:

1. AERIAL IMAGERY PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

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DESIGN BY: MB
REVIEWED BY: CRM

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AERIAL PHOTOGRAPH

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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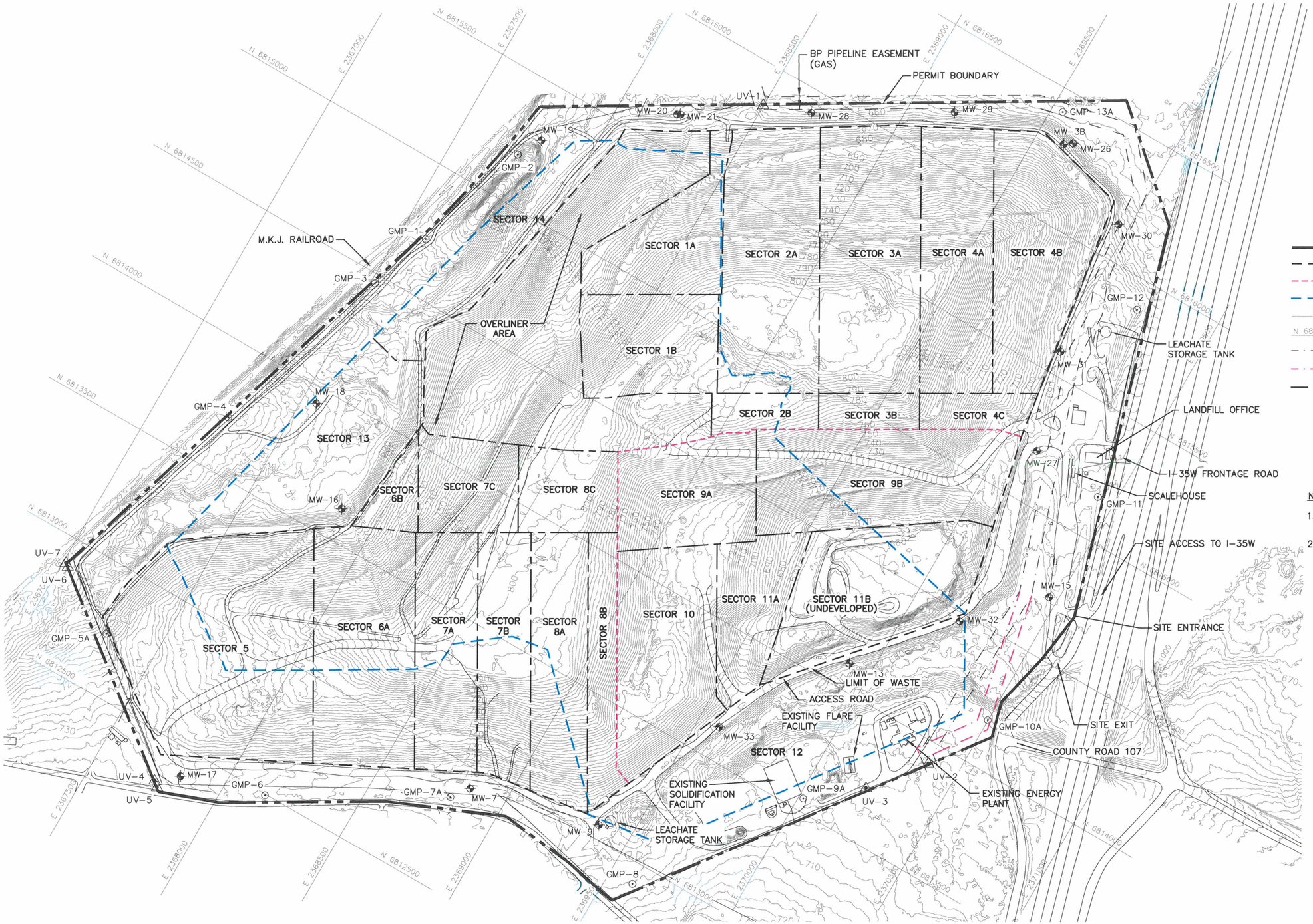
FIGURE 3

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 3-AERIAL PHOTOGRAPH.dwg, jpuhr, 1:2



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- SECTOR BOUNDARY
- MW-7 PERMITTED GROUNDWATER MONITORING WELL
- GMP-12 PERMITTED GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 4

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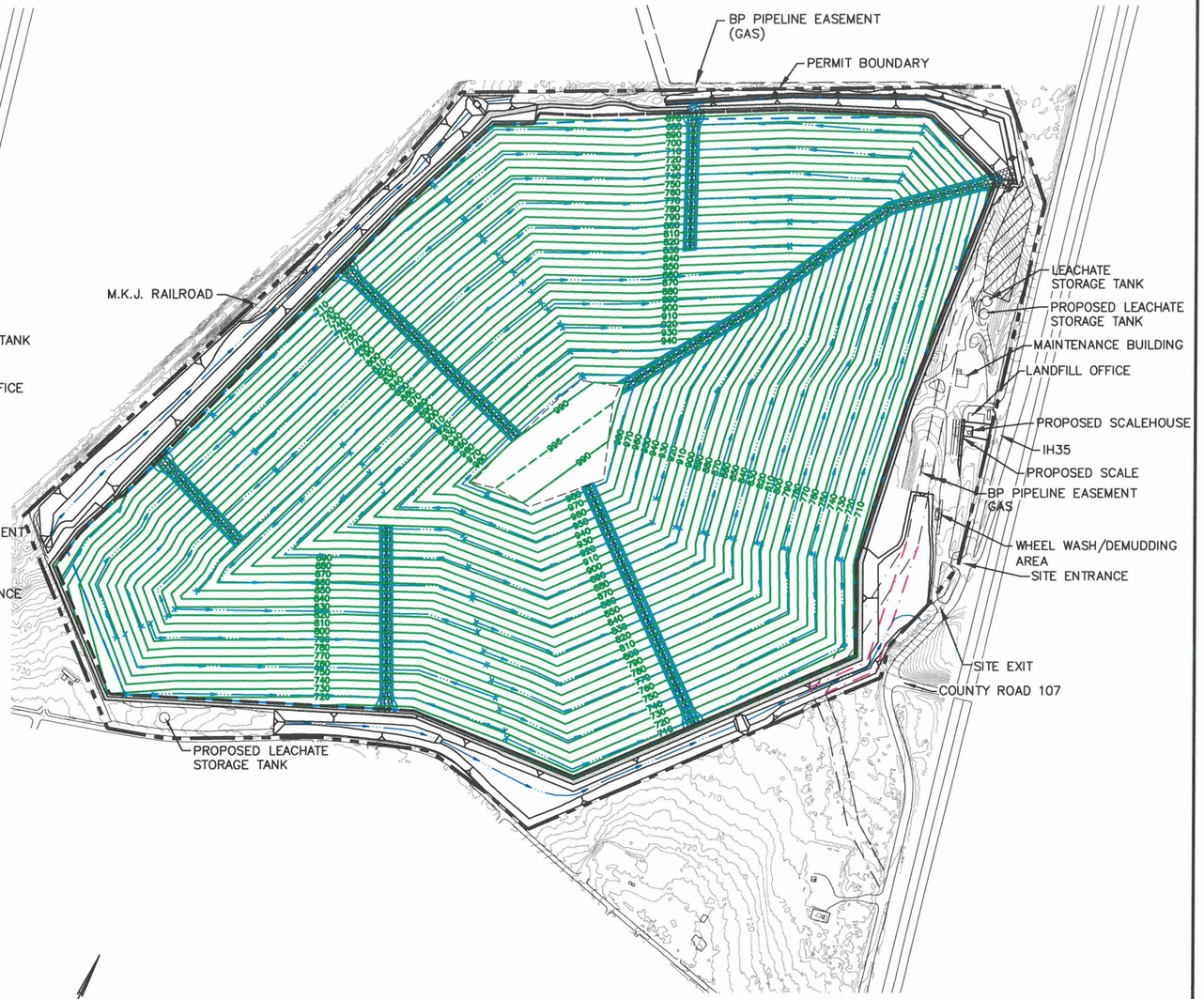
O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 4-SITE PLAN.dwg, jwilson, 1:2



PERMITTED LANDFILL COMPLETION PLAN



PROPOSED LANDFILL COMPLETION PLAN

0 300 600
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
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EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 5

O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 5-LANDFILL COMPLETION PLAN.dwg, jwilson, 1:2

ATTACHMENT 2

BIOLOGICAL ASSESSMENT REPORT

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

MAJOR PERMIT AMENDMENT APPLICATION

BIOLOGICAL ASSESSMENT REPORT

Prepared for

Texas Regional Landfill Company, LP

August 2021

Prepared by

Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-109

I/IIB-285

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2	HABITAT DESCRIPTION	2
3	PROTECTION OF THREATENED AND ENDANGERED SPECIES	3
4	SPECIES DESCRIPTIONS	4
5	CONCLUSIONS	5
6	REFERENCES	6

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A FIGURES

B PHOTOGRAPHS

C THREATENED AND ENDANGERED SPECIES TABLE

D TPWS RARE SPECIES LIST

E USFWS IPAC RESOURCE LIST

1 INTRODUCTION

The purpose of this document is to assess the effects of the proposed Turkey Creek Landfill expansion on federal and state-listed threatened and endangered species that may occur in the project area. Turkey Creek Landfill, a Type I landfill as currently permitted by the Texas Commission on Environmental Quality (TCEQ), is owned and operated by Texas Regional Landfill Company, LP, which is a wholly-owned subsidiary of Waste Connections, Inc. Waste Connections, Inc., one of the largest waste management companies in the United States, provides waste collection, transfer, and disposal services for residential, commercial, and industrial customers throughout the country. The Turkey Creek Landfill is located in Johnson County, Texas, approximately 2.5 miles south of the City of Alvarado on the west side of U.S. Interstate Highway 35 (IH-35). A site location map is included on Figure 1 of Attachment A. The expansion involves increasing the amount of waste fill within the currently permitted waste footprint by increasing the height of the final fill grades. The permitted landfill disposal footprint has been disturbed by disposal cell construction or support facilities, roads, and drainage features construction.

Photographs of the property are provided in Attachment B.

2 HABITAT DESCRIPTION

The project is located in the East Cross Timbers ecoregion of Texas (Diggs, G.M., Jr., et al., 2006; Correll and Johnston, 1979). The East Cross Timbers occurs largely on sandy soils with parent material from the Woodbine formation. Soils can be slightly acidic and consist of sandy to sandy loams. Land use in this region varies between urban and rural types and includes industrial, transportation, ranching and farming. The vegetation historically consisted of woodlands dominated by post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), cedar elm (*Ulmus crassifolia*), pecan (*Carya illinoinensis*), bois d'arc (*Maclura pomifera*), eastern redcedar (*Juniperus virginiana*), mesquite (*Prosopis glandulosa*), gum bumelia (*Sideroxylon lanuginosum*), hawthorn (*Crataegus* spp.), greenbriar (*Smilax* spp.). Numerous streams course through the region and are dominated by pecans, bur oak (*Quercus macrocarpa*), American elm (*Ulmus americana*), slippery elm (*U. rubra*), ash (*Fraxinus* spp.), cottonwood (*Populus deltoides*), sugar hackberry (*Celtis laevigata*) and black willow (*Salix nigra*).

Vegetation observed during the field visit on July 17, 2018 consisted of American elm, pecan, black willow, giant ragweed (*Ambrosia trifida*), roughleaf dogwood (*Cornus drummondii*), cottonwood, poison ivy (*Toxicodendron radicans*), cat greenbriar (*Smilax glauca*), sumpweed (*Iva annua*), Johnsongrass (*Sorghum halepense*), partridge pea (*Chamaecrista fasciculata*), Canada wildrye (*Elymus canadensis*), goldenrod (*Solidago* spp.), rattlepod (*Sesbania* spp.) and sunflower (*Helianthus* spp.).

3 PROTECTION OF THREATENED AND ENDANGERED SPECIES

The purpose of the Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems on which they depend. It is administered by the U.S. Fish and Wildlife Service (USFWS) and the Commerce Department's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife such as whales and anadromous fish such as salmon.

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments (USFWS, Endangered Species Homepage, July 2018).

The USFWS and the Texas Parks and Wildlife Department (TPWD) provide protection for a variety of threatened and endangered species in Texas. Databases of these agencies were reviewed to determine state and/or federally listed threatened or endangered species that occur or historically have occurred in Johnson County.

The USFWS lists two endangered species and three threatened species as occurring in Johnson County (refer to Table 1 of Attachment C). No critical habitat for any federally threatened or endangered species occurs in the project area.

In addition to federally listed species, the TPWD lists three endangered species and eight threatened species as occurring in Johnson County (refer to Table 1 of Attachment C).

A copy of the TPWD List of Rare Species is provided in Attachment D. A copy of the USFWS's IPaC Resource List of Jurisdictional Species is provided in Attachment E.

4 SPECIES DESCRIPTIONS

The interior least tern and red knot should be considered only for wind energy projects within the migratory route of these species. The whooping crane and piping plover are considered migratory through this area. Although migratory species occasionally stop over at points along their migratory routes, use of the landfill area would be highly unlikely due to the current land uses of the site.

Habitat for the white-faced ibis and black rail is not present on the site. Therefore, the proposed project would have no impact on these species.

The golden-cheeked warbler requires specific composition of woody species. The warbler prefers juniper-oak woodlands and is dependent on mature Ashe juniper. Suitable habitat for this species was not observed within the project area.

Two mollusks are state-listed as threatened and include the Brazos heelsplitter and Texas fawnfoot. Appropriate habitat was not found within the project area.

The Brazos water snake occurs in the upper Brazos River. Suitable habitat was not found within the project area.

The Texas horned lizard occupies open, arid, and semi-arid regions with sparse vegetation. Additionally, it prefers loose loamy or sandy soils. These lizards feed almost exclusively on harvester ants. No harvester ant colonies were observed during the field investigation. No Texas horned lizards were observed during the field investigation. It is unlikely that horned lizards would utilize the area.

5 CONCLUSIONS

No suitable habitat exists on the site for any species listed for Johnson County, nor has critical habitat been designated in the project area for any threatened and endangered species. The landfill expansion will not result in the destruction or adverse modification of any federally designated critical habitat for any threatened or endangered species, nor cause or contribute to the taking of any listed threatened or endangered species. Therefore, no further investigation for threatened and endangered species is recommended.

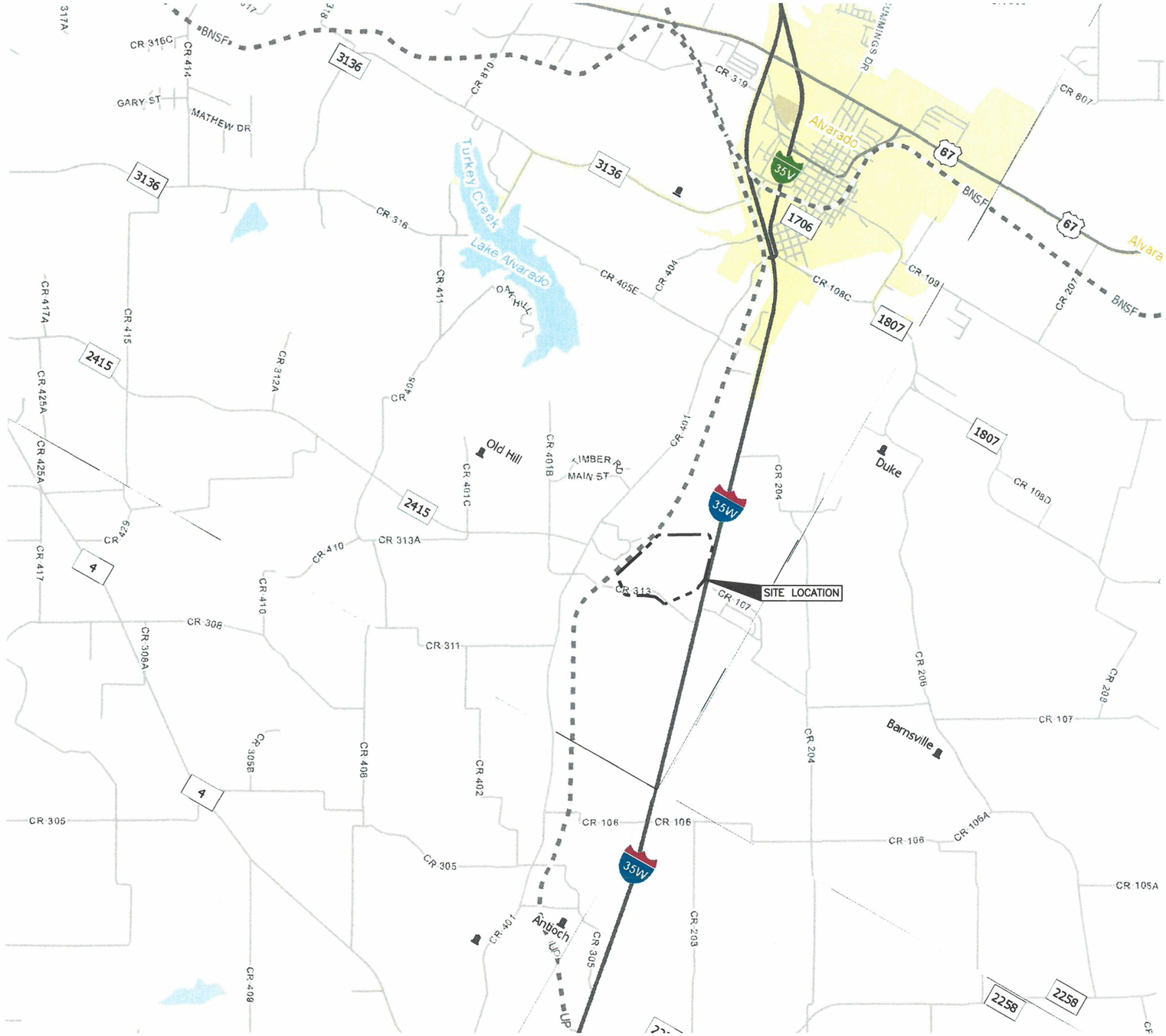
6 REFERENCES

Correll, D.S. and M.C. Johnston. 1979. *Manual of the Vascular Plants of Texas.* The University of Texas at Dallas. Richardson, Texas.

Diggs, G.M., Jr., B.L. Lipscomb, and R.J. O'Kennon. 1999. *Illustrated Flora of North Central Texas.* Botanical Research Institute of Texas and Austin College. Fort Worth, Texas.

ATTACHMENT A

FIGURES



0 1/2 1
SCALE IN MILES

LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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REVIEWED BY: CRM

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TEXAS REGIONAL LANDFILL COMPANY, LP

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SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1

0:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 1-SITE LOCATION MAP.dwg, jpuhr, 1:2

ATTACHMENT B

SITE PHOTOGRAPHS



Photo 1 – Typical view of the project area along the eastern edge. The expansion area is located to the left of the gravel road.



Photo 2 – Typical view of the expansion area along the northern edge looking east. The proposed expansion area is located on the right side of the gravel road.



Photo 3 – Typical view along the north boundary looking west. The proposed landfill expansion area is located to the left of the perimeter road.



Photo 4 – Typical view from the northwest corner looking south. Note the red marker in the photo. The proposed expansion project area is to the left of the red marker.



Photo 5 – View of the stormwater facility located within the landfill expansion area.



Photo 6 – Typical view of the expansion area along the western edge.

ATTACHMENT C

TABLE 1 – LIST OF THREATENED AND ENDANGERED SPECIES POTENTIALLY OCCURRING IN JOHNSON COUNTY

THREATENED & ENDANGERED SPECIES TABLE

TABLE 1
POSSIBLE EFFECTS TO LISTED SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT AREA (JOHNSON COUNTY, TEXAS)

Common Name *(Scientific Name)*	State Status	Federal Status	Description of Suitable Habitat	Unique, Critical, or Designated Habitat	Effects Discussion
Birds					
Golden-cheeked Warbler (*Setophaga chrysoparia*)	E	E	Prefers juniper-oak woodlands and is dependent on mature Ashe juniper with long bark strips	No	No impact; habitat not present
Interior Least Tern (*Sterna antillarum athalassos*)	E	DL	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams and rivers; also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc.); eats small fish and crustaceans; when breeding, forages within a few hundred feet of colony	No	No impact; rare transitory migrant
Red Knot (*Calidris canutus rufa*)	T	T	Prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters	No	No impact; rare transitory migrant
Black Rail *(Laterallus jamaicensis*)	T	T	Occurs in salt, brackish, and freshwater marshes, pond borders, wwet meadows, and grassy swamps.	No	No impact; habitat not present
Piping Plover (*Charadrius melodus*)	T	T	Found on islands along the Texas Gulf Coast, primarily barrier islands. Primary prey for wintering plovers includes polychaete marine worms, various crustaceans, insects, and occasionally bivalve mollusks	No	No impact; rare transitory migrant
White-faced Ibis (*Plegadis chihi*)	T		Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	No	No impact; habitat not present
Whooping Crane (*Grus americana*)	E	E	Potential migrant via plains throughout most of state to coast; winters on coastal marshes	No	No impact; habitat not present
Mollusks					

TABLE 1
POSSIBLE EFFECTS TO LISTED SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT AREA (JOHNSON COUNTY, TEXAS)

Common Name *(Scientific Name)*	State Status	Federal Status	Description of Suitable Habitat	Unique, Critical, or Designated Habitat	Effects Discussion
Brazos heelsplitter (*Potamilus streckersoni*)	T		Reported from streams but not far into the headwaters. Typically found in standing to slow-flowing water in soft substrates consisting of silt, mud or sand.	No	No impact; habitat not present
Brazos heelsplitter (*Potamilus streckersoni*)	T		Reported from streams but not far into the headwaters. Typically found in standing to slow-flowing water in soft substrates consisting of silt, mud or sand.	No	No impact; habitat not present
Texas fawnfoot (*Truncilla macrodon*)	T		This species occurs in the Brazos and Colorado river basins; prefers sand and gravel substrates and can include bank habitats and occasional backwaters; presumed host is freshwater drum	No	No impact; habitat not present
Reptiles					
Brazos Water Snake (*Nerodia harteri*)	T		Occurs in the upper Brazos River drainage basin; prefers riffles in shallow water with rocky bottoms and rocky portions of banks	No	No impact; habitat not present
Texas Horned Lizard (*Phrynosoma cornutum*)	T		Open, arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush, or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive	No	No impact

Note: E – Endangered
T – Threatened
DL – Delisted Taxon, recovered, being monitored first five years

ATTACHMENT D

TPWD RARE SPECIES LIST

Last Update: 6/22/2021

JOHNSON COUNTY

AMPHIBIANS

Strecker's chorus frog *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Woodhouse's toad *Anaxyrus woodhousii*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: SU

BIRDS

bald eagle *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B,S3N

black rail *Laterallus jamaicensis*

Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of Salicornia

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

black-capped vireo *Vireo atricapilla*

Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3B

chestnut-collared longspur *Calcarius ornatus*

According to Partners in Flight's Landbird Conservation Plan (2016), this species has a continental decline of 85%. Occurs in open shortgrass settings especially in patches with some bare ground. Also occurs in grain sorghum fields and Conservation Reserve Program lands

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

DISCLAIMER

The information on this web application is provided "as is" without warranty as to the currentness, completeness, or accuracy of any specific data. The data provided are for planning, assessment, and informational purposes. Refer to the Frequently Asked Questions (FAQs) on the application website for further information.

JOHNSON COUNTY

BIRDS

Franklin's gull *Leucophaeus pipixcan*

This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

golden-cheeked warbler *Setophaga chrysoparia*

Ashe juniper in mixed stands with various oaks (Quercus spp.). Edges of cedar brakes. Dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S2S3B

interior least tern *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: DL: Delisted	State Status: E	SGCN: N
Endemic: N	Global Rank: G4T3Q	State Rank: S1B

lark bunting *Calamospiza melanocorys*

According to Partners in Flight's Landbird Conservation Plan (2016), this species has a continental decline of 86%. Overall, it's a generalist in most short grassland settings including ones with some brushy component plus certain agricultural lands that include grain sorghum. Short grasses include sideoats and blue gramas, sand dropseed, prairie junegrass (Koeleria), buffalograss also with patches of bluestem and other mid-grass species. This bunting will frequent smaller patches of grasses or disturbed patches of grasses including rural yards. It also uses weedy fields surrounding playas. This species avoids urban areas and cotton fields.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

mountain plover *Charadrius montanus*

Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

piping plover *Charadrius melodus*

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JOHNSON COUNTY

BIRDS

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

rufa red knot *Calidris canutus rufa*

Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (Donax spp.) on beaches and dwarf surf clam (Mulinia lateralis) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4T2	State Rank: S2N

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S2

white-faced ibis *Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

whooping crane *Grus americana*

Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1N

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JOHNSON COUNTY

FISH

Mississippi silvery minnow *Hybognathus nuchalis*

Found in eastern Texas streams, from the Brazos River eastward and northward to the Red River; found in moderate current; silty, muddy, or rocky substrate. In Texas, adults likely to inhabit smaller tributary streams.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: G5 State Rank: S4

INSECTS

a caddisfly *Neotrichia juani*

Specimens were collected from perennial and ephemeral rivers, and small spring-fed streams (Harris and Tiemann 1993).

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: G1 State Rank: S1

American bumblebee *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: G3G4 State Rank: SNR

MAMMALS

big brown bat *Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S5

black-tailed prairie dog *Cynomys ludovicianus*

Dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S3

cave myotis bat *Myotis velifer*

Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (Hirundo pyrrhonota) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4G5 State Rank: S2S3

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JOHNSON COUNTY

MAMMALS

eastern red bat *Lasiurus borealis*

Red bats are migratory bats that are common across Texas. They are most common in the eastern and central parts of the state, due to their requirement of forests for foliage roosting. West Texas specimens are associated with forested areas (cottonwoods). Also common along the coastline. These bats are highly mobile, seasonally migratory, and practice a type of "wandering migration". Associations with specific habitat is difficult unless specific migratory stopover sites or wintering grounds are found. Likely associated with any forested area in East, Central, and North Texas but can occur statewide.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

eastern spotted skunk *Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S3

hoary bat *Lasiurus cinereus*

Hoary bats are highly migratory, high-flying bats that have been noted throughout the state. Females are known to migrate to Mexico in the winter, males tend to remain further north and may stay in Texas year-round. Commonly associated with forests (foliage roosting species) but are found in unforested parts of the state and lowland deserts. Tend to be captured over water and large, open flyways.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

long-tailed weasel *Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

mountain lion *Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

Muskrat *Ondatra zibethicus*

Found in fresh or brackish marshes, lakes, ponds, swamps, and other bodies of slow-moving water. Most abundant in areas with cattail. Dens in bank burrow or conical house of vegetation in shallow vegetated water. It is primarily found in the Rio Grande near El Paso and in SE Texas in the Houston area.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

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JOHNSON COUNTY

MAMMALS

swamp rabbit *Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

tricolored bat *Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S3S4

western hog-nosed skunk *Conepatus leuconotus*

Habitats include woodlands, grasslands & deserts, to 7200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. telmalestes

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

MOLLUSKS

Brazos Heelsplitter *Potamilus streckersoni*

Reported from streams, but not far into the headwaters, to large rivers, and some reservoirs. In riverine systems occurs most often in nearshore habitats such as banks and backwater pools but occasionally in mainchannel habitats such as riffles. Typically found in standing to slow-flowing water in soft substrates consisting of silt, mud or sand but occasionally in moderate flows with gravel and cobble substrates (Randklev et al. 2014b,c; Tsakiris and Randklev 2016b; Smith et al. 2019) [Mussels of Texas 2020]

Federal Status:	State Status: T	SGCN: Y
Endemic: Y	Global Rank: GNR	State Rank: SNR

Texas Fawnsfoot *Truncilla macrodon*

Occurs in large rivers but may also be found in medium-sized streams. Is found in protected near shore areas such as banks and backwaters but also riffles and point bar habitats with low to moderate water velocities. Typically occurs in substrates of mud, sandy mud, gravel and cobble. Considered intolerant of reservoirs (Randklev et al. 2010; Howells 2010o; Randklev et al. 2014b,c; Randklev et al. 2017a,b). [Mussels of Texas 2019]

Federal Status: C	State Status: T	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S2

REPTILES

Brazos water snake *Nerodia harteri*

Aquatic: Shallow, fast-flowing water with a rocky or gravelly substrate preferred. Adults can be found in deep water with mud bottoms, such as large section fo rivers and reservoirs. Riffle habitat is particularly important for this species.

Federal Status:	State Status: T	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

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JOHNSON COUNTY

REPTILES

eastern box turtle *Terrapene carolina*

Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3

Prairie Skink *Plestiodon septentrionalis*

The prairie skink can occur in any native grassland habitat across the Rolling Plains, Blackland Prairie, Post Oak Savanna and Pineywoods ecoregions.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S5

slender glass lizard *Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3

smooth softshell *Apalone mutica*

Aquatic: Large rivers and streams; in some areas also found in lakes and impoundments (Ernst and Barbour 1972). Usually in water with sandy or mud bottom and few aquatic plants. Often basks on sand bars and mudflats at edge of water. Eggs are laid in nests dug in high open sandbars and banks close to water, usually within 90 m of water (Fitch and Plummer 1975).

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3

Texas garter snake *Thamnophis sirtalis annectens*

Terrestrial and aquatic: Habitats used include the grasslands and modified open areas in the vicinity of aquatic features, such as ponds, streams or marshes. Damp soils and debris for cover are thought to be critical.

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G5T4 State Rank: S1

Texas horned lizard *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G4G5 State Rank: S3

western box turtle *Terrapene ornata*

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JOHNSON COUNTY

REPTILES

Terrestrial: Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

western massasauga *Sistrurus tergeminus*

Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3S4

PLANTS

Hall's prairie clover *Dalea hallii*

In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S2

Reverchon's scurfpea *Pediomelum reverchonii*

Mostly in prairies on shallow rocky calcareous substrates and limestone outcrops; Perennial; Flowering Jun-Sept; Fruiting June-July

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Texas milk vetch *Astragalus reflexus*

Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

tree dodder *Cuscuta exaltata*

Parasitic on various Quercus, Juglans, Rhus, Vitis, Ulmus, and Diospyros species as well as Acacia berlandieri and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

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ATTACHMENT E

USFWS IPAC RESOURCE LIST

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office
2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247
Phone: (817) 277-1100 Fax: (817) 277-1129
http://www.fws.gov/southwest/es/arlingtontexas/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

In Reply Refer To:
Consultation Code: 02ETAR00-2021-SLI-2910
Event Code: 02ETAR00-2021-E-06404
Project Name: Turkey Creek Landfill Expansion

August 31, 2021

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. *No effect* - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. *May affect, but is not likely to adversely affect* - the appropriate determination when a proposed action's anticipated effects to listed species or critical habitat are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. *May affect, is likely to adversely affect* - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a consequence of the proposed action, and the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service has performed up-front analysis for certain project types and species in your project area. These analyses have been compiled into *determination keys*, which allows an action agency, or its designated non-federal representative, to initiate a streamlined process for determining a proposed project's potential effects on federally listed species. The determination keys can be accessed through IPaC.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (https://www.fws.gov/birds/management/managed-species/eagle-management.php). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php.

For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arlington Ecological Services Field Office
2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247
(817) 277-1100

Project Summary

Consultation Code: 02ETAR00-2021-SLI-2910
Event Code: 02ETAR00-2021-E-06404
Project Name: Turkey Creek Landfill Expansion
Project Type: Landfill
Project Description: Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain the authorization for an expansion of the existing Turkey Creek Landfill.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@32.353799300000006,-97.2027978592356,14z



Counties: Johnson County, Texas

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Golden-cheeked Warbler (=wood) *Dendroica chrysoparia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/33	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. The location of the critical habitat is not available. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

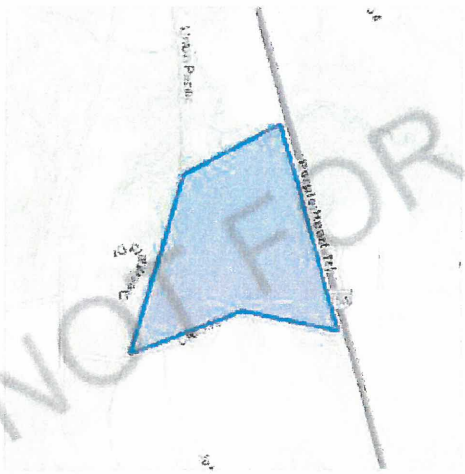
This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Johnson County, Texas



Local office

Arlington Ecological Services Field Office

(817) 277-1100
(817) 277-1129

2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247

http://www.fws.gov/southwest/es/arlingtontexas/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME STATUS

NOT FOR CONSULTATION

Golden-cheeked Warbler (=wood) Dendroica chrysoparia — Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/33

Piping Plover Charadrius melodus — Threatened
This species only needs to be considered if the following condition applies:
- Wind Energy Projects

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/6039

Red Knot Calidris canutus rufa — Threatened
Wherever found
This species only needs to be considered if the following condition applies:
- Wind Energy Projects

There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/1864

Whooping Crane Grus americana — Endangered
There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/758

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

NOT FOR CONSULTATION

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

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Red-headed Woodpecker Melanerpes erythrocephalus Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

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Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

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What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

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For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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COORDINATION WITH
NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

- March 3, 2022, NCTCOG Review Request Letter

Weaver Consultants Group

March 3, 2022
Project No. 0771-368-11-123

Mr. Jeff Mayfield
Environment and Development Planner
North Central Texas Council of Governments
616 Six Flags Drive
Arlington, TX 76011

Re: NCTCOG Conformance Review Request
Major Permit Amendment Application – MSW 1417D
Turkey Creek Landfill

Dear Mr. Mayfield:

Consistent with the requirements of Title 30 Texas Administrative Code (TAC) §330.61(p), please find attached a copy of Parts I/II of the referenced major permit amendment application which has been prepared for Texas Regional Landfill Company, LP. The purpose of the major permit amendment is to increase the disposal capacity of the Turkey Creek Landfill (Turkey Creek) by expanding the landfill. The currently permitted peak elevation of 946 feet mean sea level (ft-msl) will be increased to 996 ft-msl and the existing 146.4-acre waste disposal area will be expanded to 172 acres, which will increase the permitted disposal capacity by approximately 10.8 million cubic yards. The continued operation of the Turkey Creek Landfill will provide for the long-term disposal needs of Johnson County and surrounding communities.

The major permit amendment application was submitted to TCEQ on March 3, 2021. The submittal of Parts I/II of the application to the North Central Texas Council of Governments (NCTCOG) is made pursuant to Title 30 TAC §330.61(p), which reads:

> *"Council of governments and local government review request. The owner or operator shall submit documentation that Parts I and II of the application were submitted for review to the applicable council of governments for compliance with regional solid waste plans. The owner or operator shall also submit documentation that a review letter was requested from any local governments as appropriate for compliance with local solid waste plans. A review letter is not a prerequisite to a final determination on a permit or registration application."*

We believe that the continued development of the Turkey Creek Landfill is consistent with the NCTCOG Regional Solid Waste Plan for the following reasons:

- One of the goals of the NCTCOG's Regional Solid Waste Plan is to develop regional cost-effective, efficient and environmentally-suitable solid waste management systems. The Southwest Landfill is identified as a key part of the

PRPC Regional Solid Waste Plan. The continued development of the facility will provide an economical option for continued disposal.

- The Turkey Creek Landfill is specifically listed in the NCTCOG Regional Plan and is consistent with NCTCOG's goal of providing integrated waste management practices to provide ample, convenient collection and disposal options.
- The additional capacity gained by the approval of this expansion project will contribute to meeting NCTCOG's goal to regionally, ensure continued, adequate disposal capability.

Also enclosed is the completed North Central Texas Council of Governments (NCTCOG) "Regional Review of MSW Facility Application Evaluation Form" for the referenced project.

Your assistance with this matter is appreciated. We also are prepared to make a presentation to the NCTCOG, if requested. Please call if you have any questions or need additional information.

Sincerely,
Weaver Consultants Group, LLC

Charles R. Marsh, P.E.
Project Director

cc: Gary Bartels, Texas Regional Landfill Company, LP
Elijah Vandergriff, Texas Regional Landfill Company, LP

Enclosures: Parts I/II, Turkey Creek Landfill Major Permit Amendment Application
Regional Review of MSW Facility Application Evaluation Form

REGIONAL REVIEW OF MSW FACILITY APPLICATION EVALUATION FORM

North Central Texas Council of Governments

Regional Review of MSW Facility Application Evaluation Form

Section 1: General Applicant Information

1.1 Applicant's Name: Texas Regional Landfill Company, LLP
Mailing Address: 3 Waterway Square Place, Ste. 550
City, State, Zip Code: The Woodlands, TX 77380
Facility Contact Person: Gary Bartels, Southern Region Engineer

1.2 Site Location
Address: 9100 South Interstate Highway 35 West (IH-35W)
Zip Code: 76009
Nearest City: Alvarado, Texas
County: Johnson

1.3 Is this a new facility or an amendment to a current permit/registration?

☐ New Facility ☒ Amendment to current permit/registration

1.4 Is this a permit or a registration application?

☒ Permit No. 1417C (current) ☐ Registration No. _____
Note: NCTCOG's 08-09 Solid Waste Grants Program contract with TCEQ (section 4.6) requires review of all permit and registration applications.

1.5 What type of MSW facility is being registered or permitted?

☒ Type I Landfill
☐ Type I AE Landfill
☐ Type IV Landfill
☐ Type IV AE Landfill
☐ Type V Facility
☐ Other (please describe)

Describe "Other" below:

_____
_____
_____
_____
_____

1.6 What types of waste(s) are currently accepted at your facility?

☒	Municipal Waste	☒	Industrial Class III
☒	Industrial Class I	☒	Special Waste (please describe)
☒	Industrial Class II	☐	Other (please describe)

Describe "Special Waste" and/or "Other" below:

Special waste, as described in Title 30 TAC 330.3(148) is currently accepted at the Turkey Creek Landfill in accordance with the Waste Acceptance Plan previously prepared for the facility. The facility currently accepts Class 1, 2, and 3 non-hazardous industrial waste.

Source: TAC 30, §330.61(b) (1)

1.7 What types of waste(s) will be accepted at your facility in the future?

☒	Municipal Waste	☒	Industrial Class III
☒	Industrial Class I	☒	Special Waste (please describe)
☒	Industrial Class II	☐	Other (please describe)

Describe "Special Waste" and/or "Other" below:

Special waste, as described in Title 30 TAC 330.3(148) will be accepted at the Turkey Creek Landfill in accordance with the Waste Acceptance Plan previously prepared for the facility. The facility currently accepts Class 1, 2, and 3 non-hazardous industrial waste.

Source: TAC 30, §330.61(b) (1)

North Central Texas Council of Governments

Regional Review of MSW Facility Application Evaluation Form

Section 2:
Land Use Conformance – Compliance with Local Zoning or Ordinance

2.1 Is the site of your facility subject to local zoning or ordinances regarding the siting of solid waste facilities?

☐ Yes ☒ No (please proceed directly to Section 3)

If yes, which government zoning or siting standards does this facility have to comply?

_____

_____

If yes, please attach documentation from the local zoning or siting entity indicating that the facility is in compliance with the standards or that a formal variance has been granted. If applicable, provide maps detailing all boundaries of the areas included in the ordinance and the location of the facility.

Source: TCEQ correspondence from the Executive Director to each COG, March 4, 2003.

If documentation is provided to NCTCOG proving the facility is in compliance with the local city zoning or county siting ordinance (per §364.012 of the Texas Health and Safety Code), then the applicant does not need to answer the remaining land use questions in Section 3. Please proceed to Section 4 and continue completing the application. Once the application is complete, please return the MSW facility application evaluation form and requested documentation to NCTCOG.

North Central Texas Council of Governments

Regional Review of MSW Facility Application Evaluation Form

Section 3: Land Use Conformance – Key Issues

Texas Commission on Environmental Quality Rule 330.61 defines key land use and transportation issues that need to be addressed as a part of the regional MSW facility application evaluation process. The following questions are based on the rules, and are intended to provide information for NCTCOG to develop its conformance recommendation.

3.1 Describe the current character of surrounding land uses within one mile of the facility boundary. Please provide site design map(s) and/ or aerial photos of the area that adequately show land use.

A site map showing the land use for the 1-mile radius from the facility permit boundary is attached. No properties qualifying as "recreational use" were identified within the 1-mile radius. The vicinity of the landfill is rural agricultural and open space. The majority of residential property is rural residential, with properties generally scattered across the 1-mile radius onto multi-acre plots. A designation of land use is provided on the included Figure I/II-7.1 and I/II-7.2 as included in Parts I/II of the application, and has been reproduced below. Note that the majority of nearby commercial/industrial activity is oil field related, and was classified under a single designation of "Commercial/Light Industrial".

LAND USE WITHIN 1 MILE RADIUS OF PERMIT BOUNDARY

	ACRES	PERCENT	REMARKS
AGRICULTURAL/OPEN SPACE (INCLUDING SCATTERED RESIDENCES)	2020.4	54.6	INC. WOODED AREAS
AIRFIELD	49.5	1.3	PRIVATE GRASS RUNWAYS
CHURCH	9.0	0.2	
COMMERCIAL/LIGHT INDUSTRIAL	274.1	7.4	PRIMARILY O&G SUPPORT
FLOODPLAIN*	389.8	--	FEMA 100-YEAR FROM FIRM
RESIDENTIAL/RURAL RESIDENTIAL	537.9	14.5	
TRANSPORTATION CORRIDOR	590.3	16.1	MAJOR ROADS/HIWAYS
TURKEY CREEK LANDFILL	219.7	5.9	PERMIT BOUNDARY
TOTAL	**3700.9**	**100**	

* THE AREA OF FLOODPLAIN (389.8 ACRES) IS NOT USED TO CALCULATE THE PERCENT AREA OR TOTAL ACREAGE IN THE ABOVE TABLE.

Source: TAC 30, §330.61 (h) (2)

3.2 Provide the proximity to residences and other uses (e.g., schools, licensed day-care facilities, hospitals, churches, cemeteries, ponds, lakes, historic structures and sites, archaeologically significant sites, sites having exceptional aesthetic quality, commercial, and recreational areas) within one mile of the facility boundary. Please provide approximate number of residences and business establishments.

Residences within the 1-mile radius include approximately 160 to 180 rural homesteads, which can include multiple outbuildings at each property. There are

an estimated 10 or less commercial/light industrial facilities (multiple structures at each facility) located within the 1-mile radius of the landfill property.

The nearest residence is located approximately 50 feet from the landfill's southwest property boundary. The nearest business property (Halliburton or a subsidiary company) is located approximately 145 feet from the landfill's northern property boundary, as measured from fenceline to fenceline of the properties on aerial photography.

One church was identified as being located within the 1-mile radius of the landfill property. The Greenbriar Baptist Church is located approximately 4,300 feet west of the landfill property, on County Road 313. No schools, licensed day-care facilities, hospitals, cemeteries, ponds, lakes, historic structures and sites, archaeologically significant sites, sites having exceptional aesthetic quality, or recreational areas were identified as existing within the 1-mile radius of the landfill property.

Source: TAC 30, §330.61 (g & h)

3.3 How is the facility compatible with land uses surrounding the site?

Please explain and /or provide title and published date for any applicable land use study and provide web link if available.

A land use evaluation for the landfill is presented in Parts I/II, Section 7 of the permit amendment application.

3.4 Are there any plats on file in state or local government offices for development within one mile of the facility boundary?

☐ Yes ☒ No

If yes, please describe and provide documentation.

3.5 Is the facility consistent with growth trends of the nearest community of communities with directions of major development?

☒ Yes ☐ No

Please explain.

While some growth is occurring in Johnson County and the City of Alvarado to the north (1.4 percent and 1.34 percent annually (respectively) for the period 2010 to 2017), growth observed over the past 20 years in the near vicinity of the landfill property (i.e., within the 1-mile radius), as observed from aerial photography, is minimal and generally limited to oil field related commercial properties along IH-35W, and rural residential growth west of the landfill property (west of the Union Pacific railroad tracks) and east of the landfill property (east of IH-35W).

3.6 Explain how the facility will be designed to avoid any impact to all known water wells within 500 feet of the facility boundary.

Source: TAC 30, §330.61 (c) (2)

3.7 Will roads be available and adequate for access to the facility?

☒ Yes ☐ No

Please explain.

The primary route to the site is IH-35W, with vehicles traveling from the north and south to access the landfill. A traffic study was submitted to the Texas Department of Transportation (TxDOT) that demonstrates that IH-35W and supporting access roads and structures will not be negatively impacted by the proposed expansion of the landfill.

Source: TAC 30, §330.61(i) (1)

3.8 Will traffic into and out of the facility impact traffic patterns, within one mile of the facility, that currently exist and will occur over the expected life of the facility?

☐ Yes ☒ No

Please explain.

Additional discussion regarding the impacts from traffic entering and exiting the facility can be found in Appendix I/IID of the permit amendment application. As demonstrated within the traffic study, the landfill expansion will not have a significant impact on traffic patterns on the adjacent IH-35W, or negatively impact the access roads and structures that serve the landfill property.

Source: TAC 30, §330.61(i) (2)

North Central Texas Council of Governments

Regional Review of MSW Facility Application Evaluation Form

The remaining questions refer to land use issues that NCTCOG feels are important for the regional MSW facility application evaluation.

3.9 Describe any additional information that will be beneficial regarding how the facility will be built and operated to be compatible with the current land uses of adjacent properties. (Optional)

The landfill is situated in a rural part of Johnson County, and is surrounded by sparsely populated rural properties, open and wooded areas, and agricultural lands. The eastern border of the landfill property abuts IH-35W. The landfill has been in operation for over 30 years, and has an excellent record of operation and controlling impacts (litter, noise, odor) to neighboring properties.

3.10 Describe measures to minimize the impact from trash, odor and any other potential nuisances related to your operation on surrounding land use.

The generation of landfill gas is one of the primary sources of odor at a landfill, which becomes a nuisance to neighboring landowners. The Turkey Creek Landfill utilizes a landfill gas collection and control system to collect the gas before it can enter the atmosphere and become a nuisance. Additionally, the facility will be responsible for cleanup of waste materials spilled on access roads within two miles of the site entrance. The facility has measures in place (e.g. pyrotechnic devices) to control disease vector populations and bird populations.

Source: TAC 30, §330.63(b)

3.11 If the facility is a landfill, what will be the maximum permitted elevation of the facility? (Please provide a final contour map or graphic representation of the facility.)

The final elevation of the permitted landfill will be increased to 946 feet sea level. A completion plan (Figure I/II-A.8) is included in the Part I/II application.

How will the facility compare to the general terrain of the area, within two miles of the facility boundary?

Surrounding areas are generally flat to lightly rolling hills. The landfill will be higher than the general terrain of the area, however, the implementation of vegetation screening will be utilized to blend the facility into the existing terrain.

Source:.

3.12 Describe any measures that you will implement to screen and/or blend the facility with surrounding features.

Existing woody vegetation existing on landfill property will be maintained and not removed except as needed for landfill operations. Additional screening will be provided through the use of fencing, planted vegetation, and natural vegetation in the buffer zones.

Source: TAC 30, §330.61(d) (7)

3.13 Describe any landscaping measures that you will implement to improve the aesthetics of the facility. (Please attach any landscaping plans.)

Currently the landfill utilizes trees and vegetation in buffer areas to improve the aesthetics of the facility. As the site develops, additional trees and vegetation will be established as needed.

Source:

North Central Texas Council of Governments

Regional Review of MSW Facility Application Evaluation Form

Section 4: Regional Conformance

Another component of evaluating conformance includes how the facility will affect the regional solid waste management goals of the North Central Texas Council of Governments that are included in the regional solid waste management plan, *See Less Trash Regional Solid Waste Management Plan*. In order to complete this evaluation, please provide a description of how your facility will contribute to the attainment of these goals.

In requesting this information, NCTCOG recognizes that individual facilities alone will not be held responsible to achieve these regional goals. However, solid waste facilities represent an important component of a regional integrated solid waste management system, and can contribute to the attainment of regional goals. Facilities will be expected to make a good faith effort to contribute to the attainment of the regional solid waste goals.

To assist in the completion of this section, examples of activities/programs that could be implemented to assist in the attainment of these regional goals are listed for each of the three goals. These examples are based directly on objectives included in the *See Less Trash Regional Solid Waste Management Plan*. However, they are intended to only serve as examples, as individual facilities need to determine how they will contribute to regional goals.

Goal No. 1: Time to Recycle

The regional goal for Time to Recycle is that purchased materials are reused and recycled wherever possible, while increasing waste prevention and reduction throughout the region.

Examples for Facilities to Consider

- Assist in the development of outreach and education programs to facilitate long-term changes in attitudes about source reduction, reuse and recycling.
- Contribute to efforts to expand commercial recycling efforts by businesses and governments across the region.
- Contribute to efforts to increase citizen participation in reuse and recycling through the following types of programs:
  - Facility has a drop-off site to accept materials for recycling; or
  - Facility diverts clean loads of brush/yard waste for alternative uses (e.g. mulching, composting, daily cover, surface stabilization for landfill traffic and equipment due to wet conditions).
- Assist efforts to expand the collection and management of special waste, which includes materials such as household hazardous waste, tires and sludge.
- Promote innovative technologies to reduce waste.

4.1 Please describe any services or activities that you can provide, or are currently providing, to the region to assist with meeting this regional goal.

The Turkey Creek Landfill maintains an existing citizens drop-off recycling area on site to increase citizen participation in re-use and recycling activities.

Goal No. 2: Stop Illegal Dumping

The regional goal for Stop Illegal Dumping is to see that illegal dumping is significantly reduced in the North Central Texas region.

Examples for Facilities to Consider

- Contribute to efforts to facilitate public awareness and education opportunities to reduce littering and illegal dumping.
- Use public awareness materials (e.g. signs, brochures, etc.) developed by NCTCOG to help stop illegal dumping.
- Participate in community clean-up efforts to reduce illegal dumping.
- Support efforts to increase enforcement against illegal dumping crimes.

4.2 Please describe any services or activities that you can provide, or are currently providing, to the region to assist with meeting this regional goal.

The facility will be responsible for daily inspection and clean-up of waste materials spilled on access roads within a distance of two miles from the site entrance.

North Central Texas Council of Governments

Regional Review of MSW Facility Application Evaluation Form

Goal No. 3: Assuring Capacity for Trash

The regional goal for Assuring Capacity for Trash is that remaining waste be handled in a safe manner at permitted facilities.

Examples for Facilities to Consider

- Facility helps efforts to maintain a minimum of 10 years of capacity for that area of the NCTCOG planning region.[1]
  - Landfills may specifically contribute to this by increasing capacity.
  - Transfer stations can contribute to this by providing more efficient transportation to more distant landfills.
- Facility helps provide ample and convenient collection and disposal options in rural and other underserved areas.
  - Facility provides opportunities for residents and other low volume customers to dispose of solid waste in a convenient and affordable manner.

4.3 Please describe any services or activities that you can provide, or are currently providing, to the region to assist with meeting this regional goal.

The additional capacity gained by the approval of this project will contribute to meeting the NCTCOG's goal of providing long-term disposal capacity for the North Texas region.

[1] Capacity issues can be considered to demonstrate the need for a facility, but cannot be used as a basis against a facility.

North Central Texas Council of Governments

Regional Review of MSW Facility Application Evaluation Form

Section 5: Certification

I certify that the information contained in this form is complete and accurate and that the information in fact represents the MSW facility for which this entity is requesting a TCEQ permit or registration.

Gary Bartels

Type or Printed Name of Applicant's Chief Administrative Officer

Southern Region Engineer

Title of Chief Administrative Officer

Gary J Bartels 3-3-2022

Signature of Chief Administrative Officer **Date**

NOTE:

Please complete this form as fully and as accurately as possible. Responses to Sections 2 and 3 of the evaluation form that address the issue of land use compatibility will be submitted to the Texas Commission on Environmental Quality along with the NCTCOG's regional review of MSW facility application recommendation form.

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

MAJOR PERMIT AMENDMENT

APPENDIX I/IIC
LOCATION RESTRICTION DEMONSTRATIONS

Prepared for

Texas Regional Landfill Company, LP

February 2022





Prepared by

Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-123

This document is intended for permitting purposes only.

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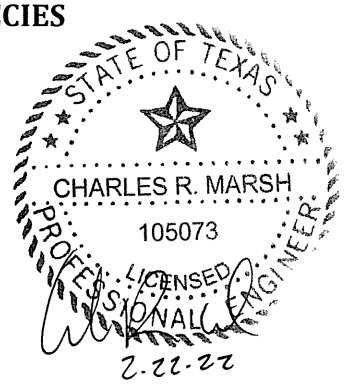

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1 INTRODUCTION

The purpose of this appendix is to provide demonstrations of the location restrictions for the Turkey Creek Landfill. Title 30 Texas Administrative Code (TAC) §330, Subchapter M identifies eleven location restrictions for the protection of human health and the environment. The eleven location restrictions include easements and buffer zones, airports, floodplains, groundwater, endangered or threatened species, wetlands, fault areas, seismic impact zones, unstable areas, coastal areas, and Type I and Type IV landfill permit issuance prohibited areas.

The Subtitle D regulations also require that the owner of a site must demonstrate either that the location restrictions do not apply or that the landfill, while located in a restricted area, is designed and operated in such a way that it protects human health and the environment.

2 EASEMENTS AND BUFFER ZONES

The easements and buffer zones location restrictions within Title 30 TAC §330.543 require that no solid waste disposal shall occur within 25 feet of the center line of any utility line or pipeline easement but no closer than the easement, unless otherwise authorized by the Executive Director. Also, all pipeline and utility easements shall be clearly marked with posts that extend at least six feet above ground level, spaced at intervals no greater than 300 feet. In addition, for vertical or lateral expansions, the owner or operator shall establish and maintain a 125-foot buffer zone for any newly permitted airspace.

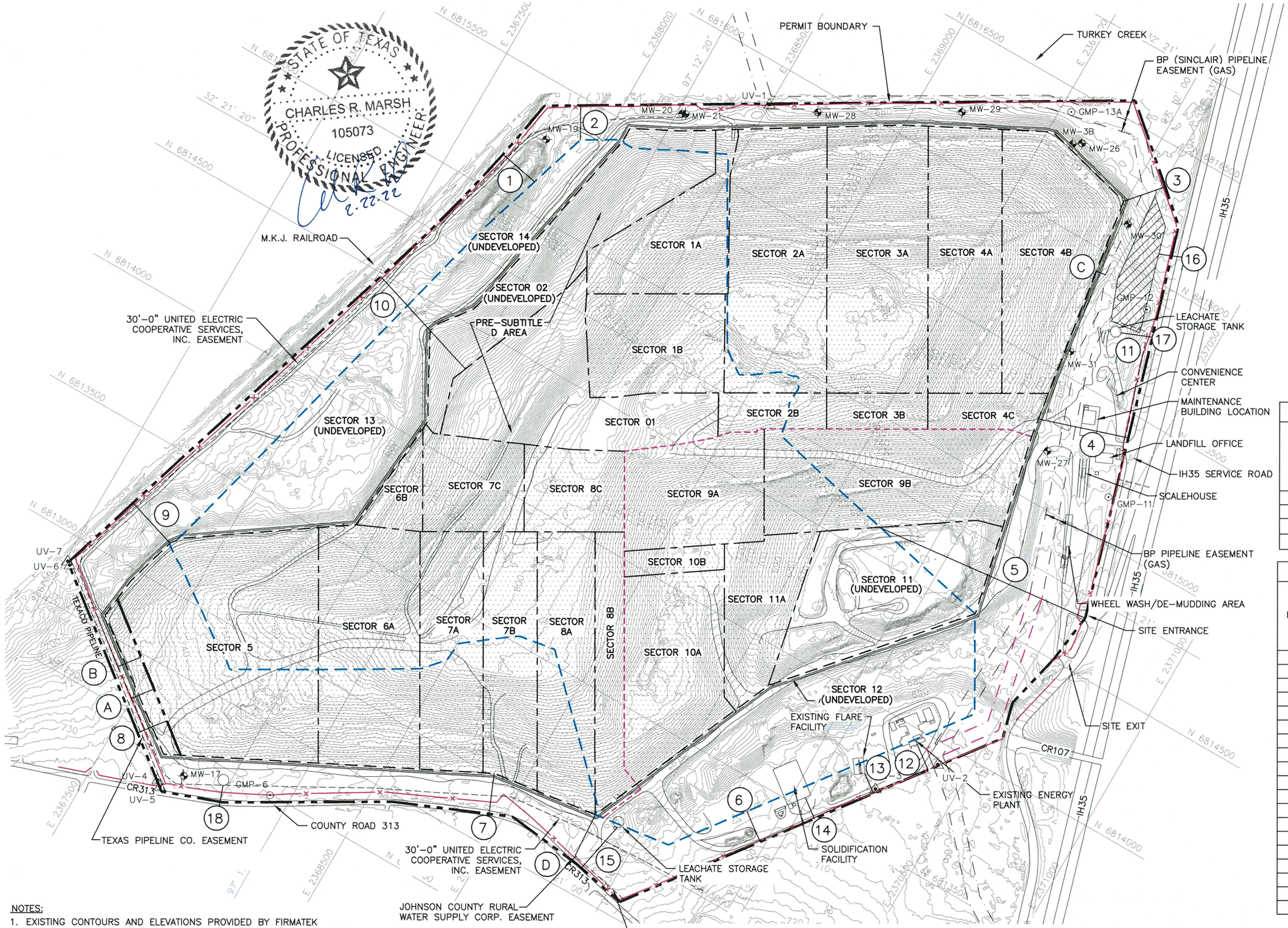
The proposed buffer zones for the site are shown on Drawing I/IIC-1 and are discussed below.

- **Existing Permitted Limits of Waste.** As shown on Drawing I/IIC-1, a buffer zone of at least 50 feet is maintained between the permit boundary and the permitted limits of waste defined in TCEQ Permit No. 1417D.
- **Expansion Area.** As shown on Drawing I/IIC-1, a minimum 125-foot buffer zone is maintained between the permit boundary and the proposed new waste disposal airspace (labeled as "newly permitted airspace limit of waste"), consistent with Title 30 TAC §330.543(b)(2)(B). No waste is proposed to be placed between the permitted limits of waste and the newly permitted airspace limits of waste.
- **Liquid Waste Bulking Facility.** As shown on Drawing I/IIC-1, a buffer zone of over 50 feet is maintained between the permit boundary and the existing and proposed liquid waste bulking facilities.
- **Leachate Storage Tank.** As shown on Drawing I/IIC-1, a buffer zone of over 50 feet is maintained between the permit boundary and the leachate storage tank.

Five easements are located within the permit boundary at the site. A Texas Pipeline Co. easement is located along the southwest portion of the permit boundary, a Sinclair Pipeline Co. (or BP Pipeline) easement traverses the eastern side of the permit boundary, two Johnson County Rural Water Supply Corp. easements (20-foot easement and 6-foot by 6-foot easements) are located along the southern side of the permit boundary, and a 30-foot United Electric Cooperative Services, Inc. easement is located along the southern portion of the permit boundary. No easement center lines are within 25 feet of the existing or proposed limits of waste, thereby

providing the required separation between the easement and the waste footprint. In addition, all utility line and pipeline easements will be clearly marked in accordance with the Site Operating Plan.

Given the above, the site is in compliance with the easements and buffer zone location restrictions.



STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED
PROFESSIONAL ENGINEER
2.22.22

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- EXISTING FENCE (SEE NOTE 4)
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- 32° 21' 20" GEODETIC COORDINATE
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 3)
- SECTOR BOUNDARY
- EXISTING SUBTITLE D COMPOSITE LINED AREA
- MW-7 PERMITTED GROUNDWATER MONITORING WELL
- GMP-12 PERMITTED GAS MONITORING PROBE

BUFFER ZONE INFORMATION		
LOCATION	BUFFER ZONE BETWEEN EASEMENT BOUNDARY AND EXISTING/PERMITTED LIMIT OF WASTE	BUFFER ZONE BETWEEN EASEMENT BOUNDARY AND NEWLY PERMITTED AIRSPACE
A	30 FEET	94 FEET
B	32 FEET	99 FEET
C	40 FEET	40 FEET
D	178 FEET	178 FEET

BUFFER ZONE INFORMATION		
LOCATION	BUFFER ZONE BETWEEN PERMIT BOUNDARY AND EXISTING/PERMITTED LIMIT OF WASTE	BUFFER ZONE BETWEEN PERMIT BOUNDARY AND NEWLY PERMITTED AIRSPACE
1	320 FEET	166 FEET
2	90 FEET	137 FEET
3	174 FEET	174 FEET
4	361 FEET	361 FEET
5	419 FEET	879 FEET
6	488 FEET	130 FEET
7	161 FEET	161 FEET
8	62 FEET	125 FEET
9	216 FEET	216 FEET
10	289 FEET	495 FEET
PROCESSING/DISPOSAL UNIT BUFFER ZONE INFORMATION		
11	EXISTING LEACHATE STORAGE TANK	123 FEET
12	EXISTING LFGTE FACILITY	110 FEET
13	EXISTING LFG FLARE	85 FEET
14	EXISTING SOLIDIFICATION FACILITY	91 FEET
15	EXISTING LEACHATE STORAGE TANK	214 FEET
16	PROPOSED LFGTE FACILITY	50 FEET
17	PROPOSED LEACHATE STORAGE TANK	125 FEET
18	PROPOSED LEACHATE STORAGE TANK	65 FEET

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. AS SHOWN IN APPENDIX I/IIC, THE BUFFER ZONES VARY AROUND THE PERIMETER OF THE SITE, BUT IN NO CASE ARE THEY LESS THAN 50-FEET FOR EXISTING WASTE. THE BUFFER ZONE BETWEEN THE PERMIT BOUNDARY AND THE NEWLY PERMITTED AIRSPACE (PERMIT NO. 1417C) IS AT LEAST 125-FEET.
3. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.
4. EXISTING FENCE IS SHOWN WHERE IT DOES NOT OVERLAP WITH PERMIT BOUNDARY. EXISTING FENCELINE LOCATED WITHIN HEAVILY VEGETATED AREAS WAS APPROXIMATED.

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SHEET I/IIC-4

- [ ] DRAFT
- [X] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 02/2022
FILE: 0771-368-11
CAD: C-1 BUFFER ZONE.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT BUFFER ZONE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

DRAWING I/IIC-1

O:\0771\368\EXPANSION 2021\PARTS I-II\I-IIC\C-1 BUFFER ZONE.dwg, rarrington, 1:2

3 AIRPORT SAFETY

The Airport Safety Location Restrictions within Title 30 TAC §330.545 require that airports within the vicinity of the landfill site be identified. The regulation states that landfill sites located within 10,000 feet of an airport runway end used by turbojet aircraft or within 5,000 feet of an airport runway end used by piston-type aircraft shall demonstrate that the units are designed and operated so that the landfill does not pose a bird hazard to aircrafts. One privately owned airport (Luscombe Acres Airport) is within the 5,000-foot radius of the site. This airport is a private use, turf runway airport located south of the Turkey Creek Landfill. In addition, one privately owned airport (Block Ranch Airport) is within the 10,000-foot radius of the site. This airport is also a private use, turf runway airport.

The FAA reviewed the proposed major permit amendment to determine the potential for the site to be a hazard to air navigation. As documented on their letters, the proposed major permit amendment does not pose a hazard to air navigation (refer to Appendix I/IIB for more information).

In addition, Title 30 TAC §330.545(b) requires that small general service airports located within a 6-mile radius of a lateral expansion be notified of the proposed expansion. There are no small general service airports located within 6 miles of the site. The Drennan Airport and Hodges Field Airfield (along with Luscombe Acres Airport and Block Ranch Airport) are located within a 6-mile radius of the site; however, these airports are designated as private use. Title 30 TAC §330.545(b) also requires that large general public commercial airports located within a 5-mile radius of a lateral expansion be notified of the proposed expansion. No large general public commercial airports are located within a 5-mile radius of the site.

Given the above, the site is in compliance with the Airport Location Restriction.

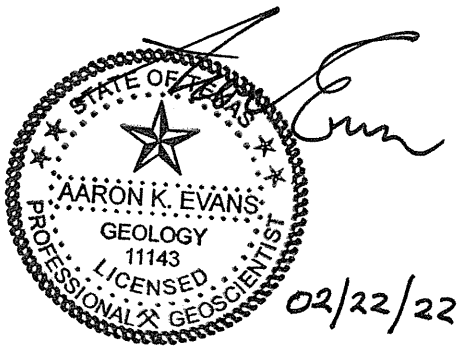
4 FLOODPLAINS

Title 30 TAC §330.547 prohibits waste disposal operations located in the 100-year floodway as defined by FEMA and requires that new expansion areas not restrict the flow of the 100-year flood, reduce the temporary water stage capacity of the floodplain, or result in washout of solid waste; and requires storage and processing facilities to be located outside of the 100-year floodplain.

Supporting floodplain information is included in Parts I/II, Section 11.1. Compliance with each floodplain location/coordination regulation is listed in Table 4-1.

Table 4-1
Floodplain Location Restriction Requirements

Regulatory Citation	Regulation Summary	How Regulation is Addressed
330.547(a)	No disposal operations located in a 100-year floodway.	No disposal operations occur within the 100-year floodway associated with the floodway of Turkey Creek or its tributaries in the project vicinity.
330.547(b)	Proposed developments shall not restrict the flow of the 100-year flood, reduce floodplain storage capacity, or result in solid waste washout.	The current landfill, which is proposed to be horizontally and vertically expanded, was developed based on the CLOMR dated September 2021. The proposed expansion is located within the 100-year floodplain of Turkey Creek. The drainage analysis provided in Part III, Appendix IIIF, provides a demonstration that proposed developments will not restrict the flow of the 100-year flood.
330.547(c)	Storage and processing facilities located outside of 100-year floodplain unless facilities prevent washout during 100-year event.	There are no storage and processing facilities located inside the 100-year floodplain.



5 GROUNDWATER

The groundwater location restriction within Title 30 TAC §330.549(a) prohibits a Type I or Type IAE landfill on the recharge zone of the Edwards Aquifer. Given that the Turkey Creek Landfill is not located on the recharge zone of the Edwards Aquifer, the site is in compliance with the groundwater location restriction.

The groundwater location restriction within Title 30 TAC §330.549(b) also requires the following.

> *"Unless the executive director approves an engineered design that the applicant has demonstrated will provide equal or greater protection to human health and the environment, a new landfill cell or an areal expansion of an existing landfill cell managing Class 1 industrial solid waste may not be located in areas described in Title 30 TAC §335.584(b)(1) and (2) of this title (relating to Location Restrictions)."*

As noted in Drawing I/II-2.2 - Existing and Proposed Landfill Excavation Plan of Part I/II, this application includes sectors that receive Class 1 waste for disposal. Therefore, Title 30 TAC §330.584(b)(1) and (2) do apply to the Class 1 areas. Drawing I/II-2.2 depicts the existing permitted landfill sectors that are permitted and proposed to manage Class 1 waste which includes Sector 9 through Sector 11, which were permitted under TCEQ Permit No. 1417C (of which Sector 11 is undeveloped) and the proposed Class 1 expansion area to the southeast of Sector 11. The configuration and excavation grade for Sector 11 were permitted in the Site Development Plan for TCEQ Permit No. 1417C and there are no proposed changes to the permitted excavation grades for Sector 11 from those depicted in the approved application under TCEQ Permit No. 1417C.

Title 30 TAC §335.584(b)(1) requires that new Class 1 disposal units not be located:

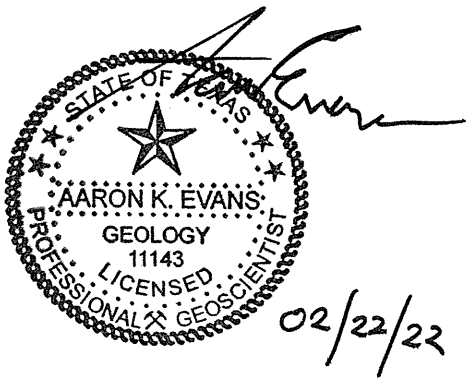
> *"in areas where underlying soil unit(s) within five feet of the base of the containment structure, which includes the sides and bottom of the containment structure, have a Unified Soil Classification of GW (well-graded gravel), GP (poorly-graded gravel), GM (silty gravel), GC (clayey gravel), SW (well-graded sand), SP (poorly-graded sand), or SM (silty sand), or a hydraulic conductivity greater than 1 x 10-5 cm/sec, unless: (A) it is in an area where the average annual evaporation exceeds average annual rainfall by more than 40 inches; or (B) the soil unit is not sufficiently thick and laterally continuous to provide a significant pathway for waste migration."*

As discussed in Appendix IIIA, the existing and proposed Class 1 waste disposal sector configuration includes construction of a 5-foot-thick clay plug separation barrier beneath the compacted clay liner system designed to provide adequate separation in accordance with Title 30 TAC §335.584(b)(1).

Title 30 TAC §335.584(b)(2) requires that new Class 1 disposal units not be located:

> *"in areas overlying a regional aquifer unless the regional aquifer is separated from the base of the containment structure, which includes the sides and bottom of the containment structure, by a minimum of ten feet of material with a hydraulic conductivity towards the aquifer not greater than 10^{-7} centimeters per second (cm/sec), or a thicker interval of more permeable material that provides equivalent or greater retardation to pollutant migration."*

As discussed in Appendix IIIG, the Woodbine Aquifer is a regional aquifer and the site-specific uppermost aquifer and is primarily composed of sand, sandstone, and sandy shale. The distance between the Woodbine Aquifer and the floor grades of Class 1 waste Sectors 9, 10, and 11 and the proposed Class 1 waste area located southeast of Sector 11 varies between 11 feet and 38 feet. As discussed in Appendix IIIG, the vertical hydraulic conductivities of the unsaturated portions of the Woodbine Formation below the Class 1 waste disposal footprint range from 1.9×10^{-9} cm/sec to 7.8×10^{-8} cm/sec. Therefore, the site is in compliance with the location restrictions of Title 30 TAC §335.584(b)(2).



6 ENDANGERED OR THREATENED SPECIES

The endangered or threatened species location restrictions within Title 30 TAC §330.551 requires that the facility and the operation of the facility shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species, or contribute to the taking of any endangered or threatened species.

The U.S. Fish and Wildlife Services (FWS) and Texas Parks and Wildlife Department (TPWD) were contacted to request information regarding endangered or threatened species or their critical habitat with respect to the site. The FWS and TPWD response letters are included in Appendix I/IIB. In addition, a site-specific threatened and endangered species habitat assessment was completed by Weaver Consultants Group, LLC in August 2021 (refer to the TPWD tab in Appendix I/IIB). This study concluded that the area within the permit boundary would not likely be occupied by any federally-listed threatened and endangered species.

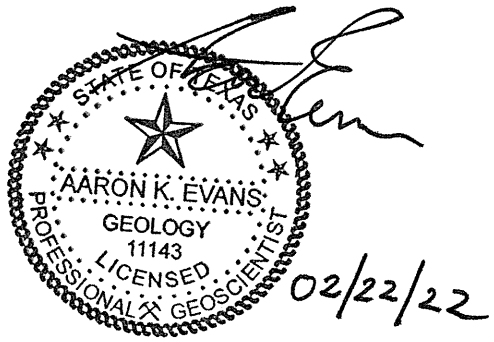
Therefore, it is concluded that the expansion of the Turkey Creek Landfill will not result in the destruction or adverse modification of the critical habitat of any threatened or endangered species, or cause or contribute to the taking of any threatened or endangered species.

Given the above, the site is in compliance with the endangered or threatened species location restriction.

7 WETLANDS

The Turkey Creek Landfill property was examined for compliance with wetlands-related location restriction provisions as described in Title 30 TAC §330.553, which states that new MSWLF units, lateral expansions, and material recovery operations from a landfill shall not be located in wetlands, unless the owner or operator makes appropriate demonstrations involving wetlands. A jurisdictional determination was completed in April 2021 by Weaver Consultants Group, LLC (correspondence with the USACE is included in Appendix I/IIB).

Given the above, the site is in compliance with the Wetland Location Restriction.



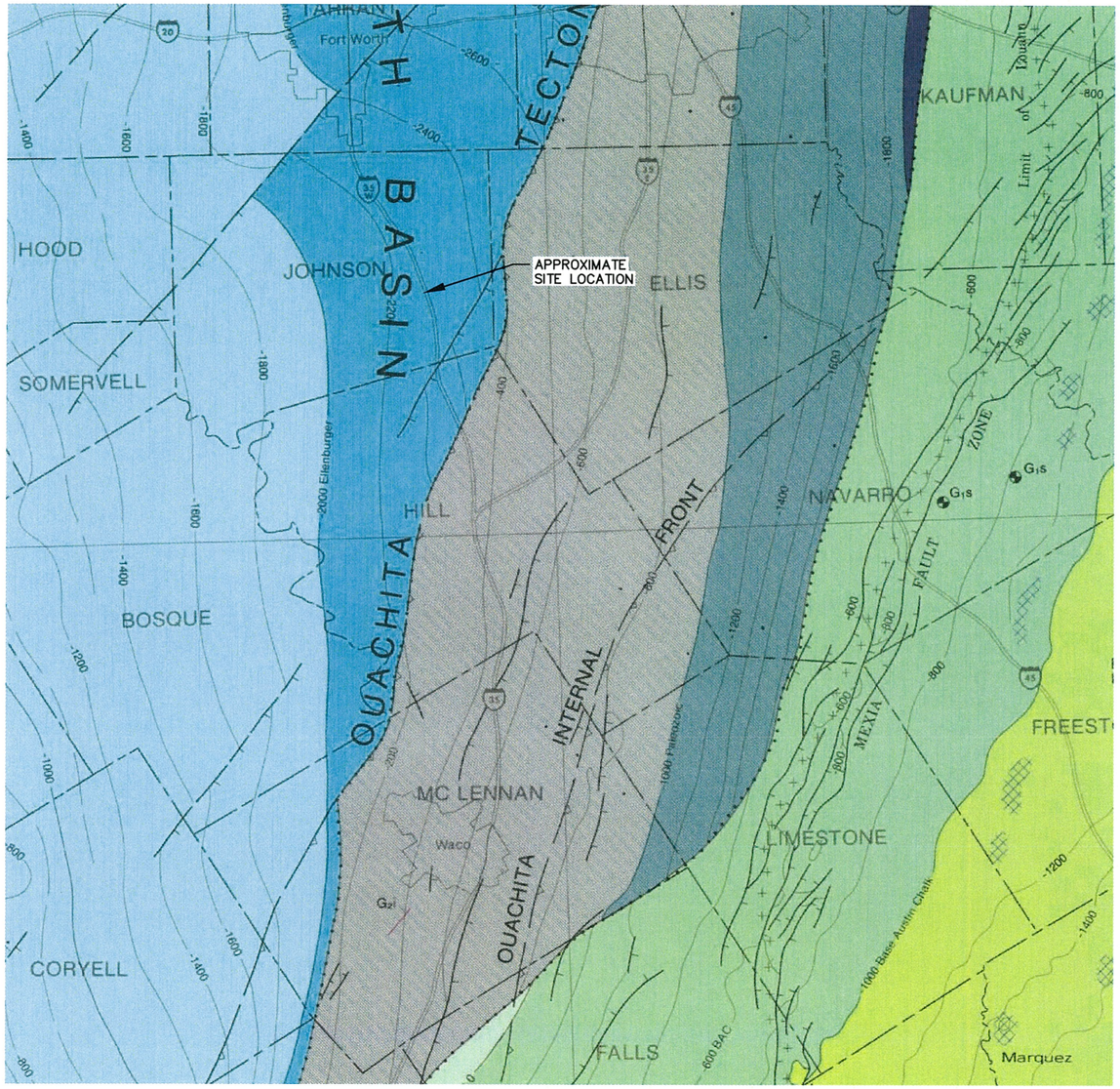
8 FAULT AREAS

The Turkey Creek Landfill and the surrounding area were examined by Aaron K. Evans, P.G., a Texas licensed WCG professional geoscientist, for indications of the presence of Holocene (last 11,000 years) faulting according to Title 30 TAC §330.555 criteria. The study included a physical inspection of the site and surrounding area, and reviews of a previous fault investigation, available literature and maps, and a current aerial photograph. The following is a summary of the findings from the study.

Consistent with Title 30 TAC §330.555, the fault study included a literary review of the Tectonic Map of Texas (BEG, 1991), Lineaments of Texas Map (BEG, 1981), the USGS Quaternary Fault and Fold Database (accessed August 2021), area USGS 7.5 Minute Topographic Quadrangle Maps (Alvarado, TX and Grandview, TX; 2019), Google Earth aerial imagery of Johnson County (accessed August 2021), and field reconnaissance of the Turkey Creek Landfill and the surrounding areas performed in multiple site visits (conducted from April 2021 to August 2021). The study was conducted to identify pre-Holocene faults that may indicate areas of concern or areas that may warrant additional investigation in the immediate landfill vicinity.

The site location is plotted on Drawing I/IIC-2 – Regional Tectonic Map, and Drawing I/IIC-3 – Regional Lineament Map. As indicated on these figures, Turkey Creek Landfill is about 3 miles northwest of the nearest mapped fault and is greater that one mile from the nearest mapped lineament. Review of the USGS Quaternary Fault and Fold Database of the United States indicated no recently active faults are located within 50 miles of the facility.

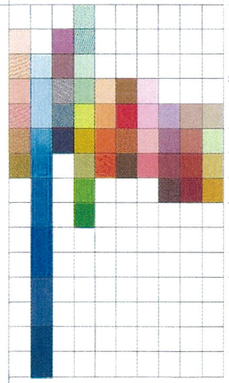
Based on review of the aforementioned references and field reconnaissance from area roadways, no areas of concern were noted in the landfill vicinity. No unusual scarps, topographic breaks, vegetation changes, or lineations were interpreted within 200 feet of the site. No structural damage to facilities, natural surface depressions, or surface indications of crude oil and natural gas accumulations were observed. No structural influence of stream courses was observed. In addition, no unusual relief or topographic features, such as sag ponds, truncated alluvial spurs, or offset tributary alignments, were observed. In summary, there is no evidence of Holocene faulting within 200 feet of the site. Therefore, the facility complies with the fault area location restriction listed in Title 30 TAC §330.555.



EXPLANATION

TECTONIC PERIOD		EXPOSED UNITS — SEDIMENTARY		EXPOSED UNITS — IGNEOUS		SUBSURFACE CONTOURS	OTHER FEATURES
TERTIARY (and Quaternary)		Bolson fill	Ts	Late basalts	Tb*	Lower Miocene (LM_1, LM_2) (2 horizons)	Calderas
				TRANS-PECOS PROVINCE: Trans-Pecos volcanic rocks (mafic to felsic, slightly to highly alkalic)	Tv	Top of Frio Fm. (TF)	
				Intrusive rocks (mostly felsic or alkalic)	Ti	Middle Frio (*Nodosaria*, N) Fm.	
						Top of Vicksburg Fm. (TV)	
						Top of Yegua Fm. (TY)	
						Top of Wilcox Gp. (TWX)	
LARAMIDE		Deformed Cretaceous strata	Ls_2			Top of Edwards Gp. (EDS)	Front of Laramide deformation
		Deformed Jurassic strata (including evaporites)	Ls_1			Top of Lower Cretaceous (TLK)	
						Top of Glen Rose Fm.	
GULF COAST	POSTRIFT	Cretaceous strata (where subsurface is not contoured)	K	BALCONES PROVINCE: Ultramafic and mafic volcanic rocks	Gu_2*	Base of Austin Chalk (BAC)	Woodbine Fm. pinch-out
				Ultramafic to felsic intrusives	Gu_1	Top of Edwards Gp. (EDS) or Top of Paleozoic (PZ)	Lower Cretaceous reef trends
	SYNRIFT	Red beds (Eagle Mills) (identified in wells only)	G_{1s}	Basalt and diabase (in wells only)	G_{1i}		Louann Salt pinch-out (Sabine area)
OUACHITA and ARBUCKLE		Upper Paleozoic foreland strata (where subsurface is not contoured)	P	Volcanic rocks (Hatton tuff in Ouachita Mountains; unnamed rhyolite in Sabine Island; volcaniclastics in South Texas)	Ov	Top of Siluro-Devonian limestone (SD) (in New Mexico)	Fronts of Ouachita deformation
		Upper Paleozoic flysch	O_2			Top of Ellenburger (ELL) or Arbuckle Gp.	
		Lower Paleozoic strata ("starved basin")	O_1	Metamorphic rocks (Sierra del Carmen)	Om	Precambrian (PC)	
						Crystalline basement (Bsmt) (in Oklahoma)	Capitan reef and Horseshoe Atoll
SOUTHERN OKLAHOMA		Cambrian-Ordovician strata (Carbonate platform) (O-P, Ordovician-Pennsylvanian, Hueco Mtns.)	CO	Post-Cambrian igneous rock (one well only)	Sv		Ellenburger Group pinch-out marked by change in contour horizons in West and North Texas
		Cambrian(?) strata (Meers Quartzite)	Ss	WICHITA PROVINCE: Cambrian felsic rocks (Wichita granite, Carlton rhyolite)	Sf		
				Cambrian mafic rocks (Raggedy Mountain gabbro group)	Sm		
VAN HORN		Young sedimentary strata younger than Vr (Van Horn sandstone)	Vs	Late rhyolite and granite (Franklin Mtns.)	Vr	Not differentiated (see basement inset)	
LLANO		Metasedimentary and metavolcanic rocks (Packsaddle, Carrizo Mtn.)	Li_2	Later granites (Town Mountain)	Li_4		
		Gneisses (Valley Spring)	Li_1	Earlier granites	Li_3		
				Ultramafic rocks (Coal Creek)	Li5		
SWISHER-DE BACA		? ? ? Sedimentary rocks (Hazel, Allamoore-Van Horn area; Castner, Mundy, Lanoria and Franklin Mtns.)	Ds	(Mafic igneous rocks in Allamoore Fm. and Mundy Breccia—not mapped separately)			
SIERRA GRANDE				Granite (Tishomingo)	SG		
CHAVES				Gneiss, Granite (Blue River, Troy)	C		

CONTOUR SHADING



SYMBOLS

FAULT TRACES (dashed where inferred or approximately located):

- Nature undetermined, downthrown side indicated
- El Cedral Fault — Normal fault, downthrown side indicated
- Dugout Creek — Thrust fault, teeth on upper plate
- Reverse fault, teeth on upthrown block
- Strike-slip fault
- Trend of major normal faults (offshore)
- Front of orogenic activity

FOLD AXIAL TRACES:

- Anticline, with plunge
- Syncline, with plunge
- Monocline
- Overturned anticline
- Overturned syncline
- Axial trend in highly folded rocks
- Strike trend in highly folded rocks (Van Horn)

Note: All faults and fold traces shown at the contoured horizon
Faults dashed where inferred, dotted where buried

CONTACTS and CONTOURS:

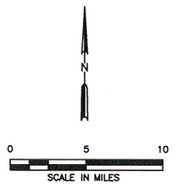
- Contact of exposed units
- -200- Contour, 200-m interval, tick on downdip side
- -100- Supplemental contour, 100-m interval
- Change of contour horizon
- vvvvvvvv Limit of volcanic cover, in Marfa Basin area

DIAPIRS and related structures:

- Gyp Hill — Salt diapir piercing the contour horizon
- Stetson — Salt diapir below the contour horizon; inferred offshore diapirs
- Conroe — Salt pillow
- Katy — Turtle structure
- Portillo — Shale diapir

OTHER:

- Volcanic center
- Ov — Well of interest, with unit penetrated
- Impact crater
- Well control (where sparse)
- COST — Continental offshore stratigraphic test



NOTE:

1. MAP ADAPTED FROM TECTONIC MAP OF TEXAS, T.E. EWING et al, 1991, BUREAU OF ECONOMIC GEOLOGY, THE UNIVERSITY OF TEXAS AT AUSTIN.

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STATE OF TEXAS
AARON K. EVANS
GEOLOGY
11143
LICENSED
PROFESSIONAL GEOSCIENTIST
02/22/22

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DESIGN BY: JBP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
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MAJOR PERMIT AMENDMENT
REGIONAL TECTONIC MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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SHEET I/IIC-12

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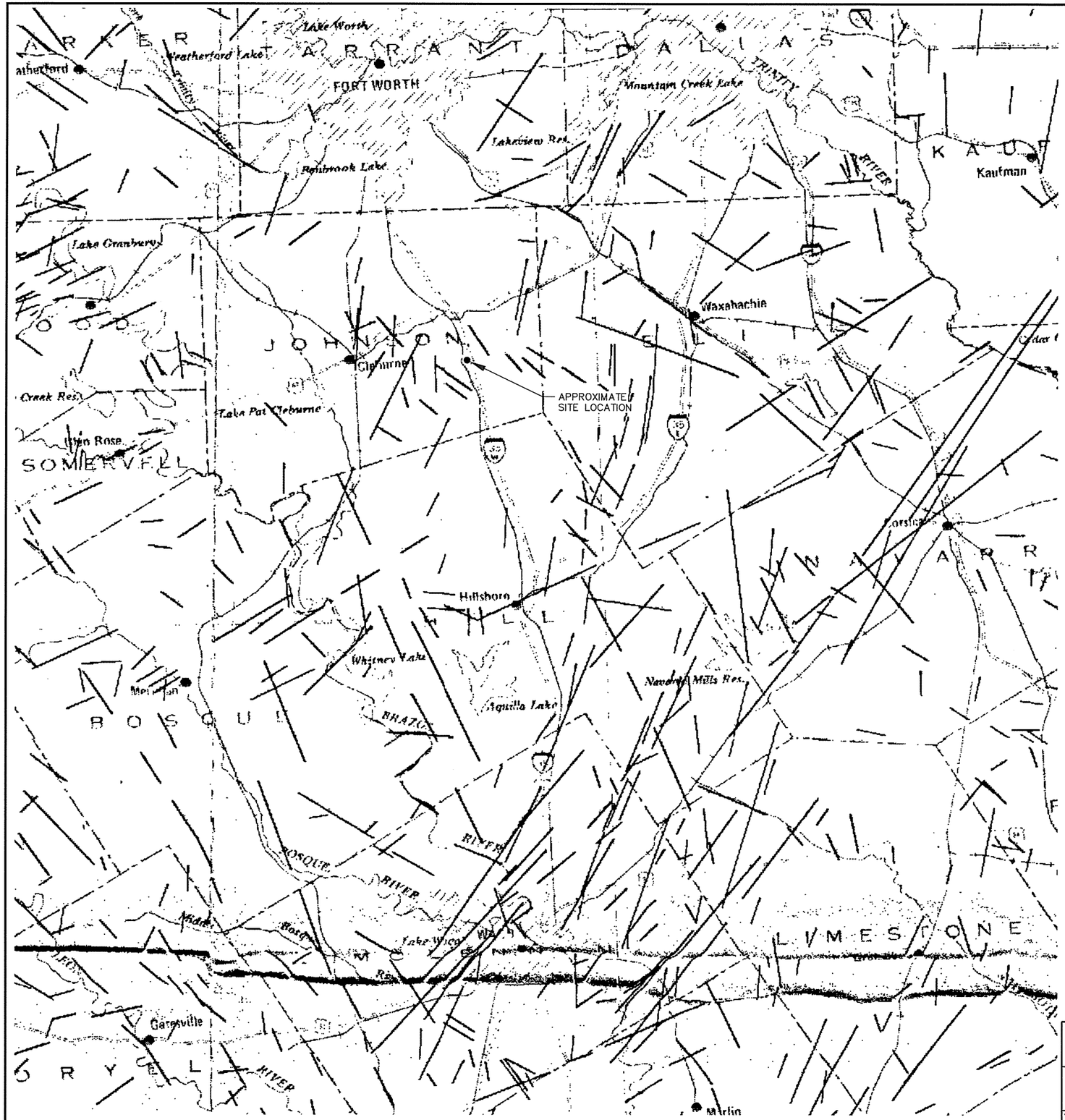

0 5 10
SCALE IN MILES

LINEAMENTS OF TEXAS

1981

THE UNIVERSITY OF TEXAS AT AUSTIN
BUREAU OF ECONOMIC GEOLOGY

BY C. M. WOODRUFF, JR., S. CHRISTOPHER CARAN, AND ERIC J. THOMPSON

Prepared for the U.S. Department of Energy, Division of Geothermal Energy
Under Contract No. DE-AS07-79-ID12057, Geothermal Resource Assessment
for the State of Texas

NOTE: Lineaments presented on this map were originally perceived on 91 Landsat images (Band 5, 1:250,000 scale) of Texas and adjacent areas.

NOTE:

1. LINEAMENT MAP ADAPTED FROM LINEAMENTS OF TEXAS, C.M. WOODRUFF et al, 1981, BUREAU OF ECONOMIC GEOLOGY, THE UNIVERSITY OF TEXAS AT AUSTIN.

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DESIGN BY: JBP
REVIEWED BY: NT

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MAJOR PERMIT AMENDMENT
REGIONAL LINEAMENT MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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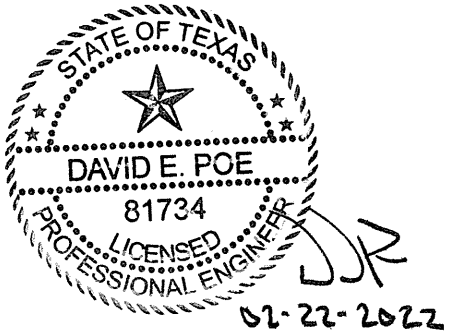
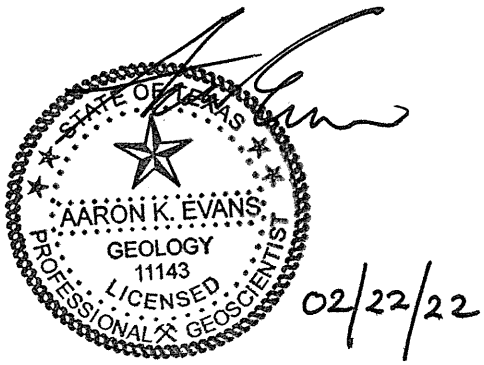
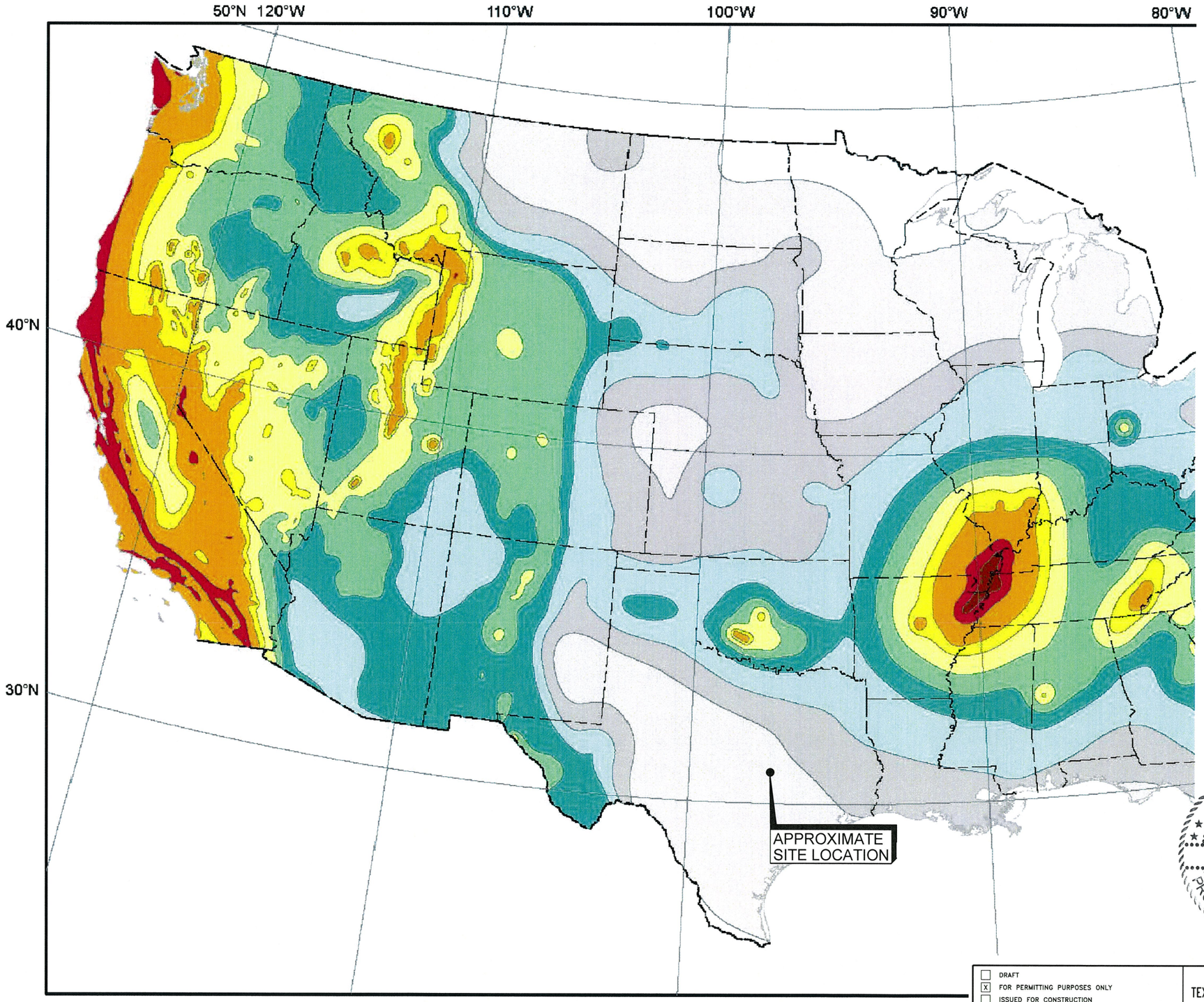
9 SEISMIC IMPACT ZONES

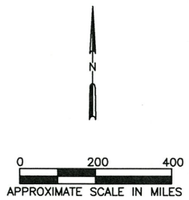
The seismic impact zone location restriction defined by Title 30 TAC §330.557 is an area with a 10 percent or greater probability that the maximum horizontal acceleration in rock, expressed as a percentage of the earth's standard gravitational pull, will exceed 0.10 g in 250 years. Drawing I/IIC-4 is a Seismic Impact Zone Map adapted from USGS seismic hazard maps for peak ground acceleration with a 2 percent in 50 years return period (USGS, 2018). According to the USGS, a 10 percent probability in 250 years is equivalent to a 2 percent probability in 50 years. According to this figure, the site has lower than a 10 percent in 250 year probability of seismic impact and the seismic impact zone location restriction does not apply.

According to USGS, the maximum seismic horizontal acceleration in the area of the site with a 2 percent exceedance probability in a 50-year time period is listed as 0.037g (3.7 percent of standard gravity). As such, the USGS-derived horizontal acceleration of the force of gravity is below the 0.10g (10 percent of the force of standard gravity) definition of a seismic impact zone, and the site complies with the seismic impact zone location restriction.







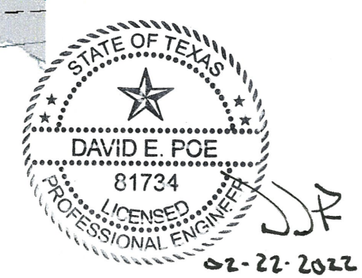


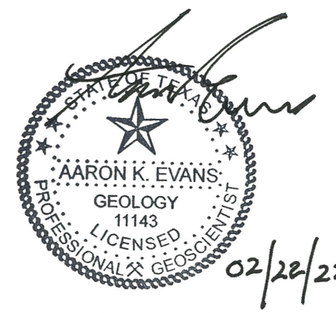
Peak horizontal acceleration (g)

- > 1.6
- 0.8 - 1.6
- 0.4 - 0.8
- 0.3 - 0.4
- 0.2 - 0.3
- 0.14 - 0.2
- 0.1 - 0.14
- 0.06 - 0.1
- 0.04 - 0.06
- 0.02 - 0.04
- < 0.02

NOTES:

1. SEISMIC IMPACT ZONE MAP MODIFIED FROM 2018 USGS NATIONAL SEISMIC HAZARD MAP FOR 2% EXCEEDANCE PROBABILITY IN A 50 YEAR TIME FRAME.
2. ACCORDING TO THE USGS EARTHQUAKE HAZARD WEBSITE (http://earthquake.usgs.gov),THE PROBABILITY THAT THE PEAK GROUND ACCELERATION WILL EXCEED 0.04g IN A 250-YEAR TIME PERIOD AT THE TURKEY CREEK LANDFILL IS 3.8 PERCENT.





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DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

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SEISMIC IMPACT ZONE MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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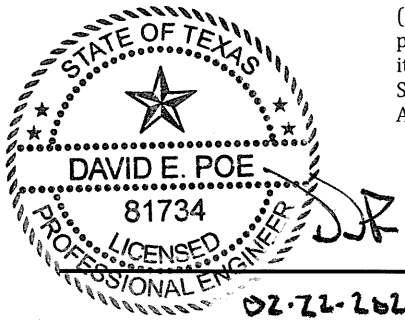
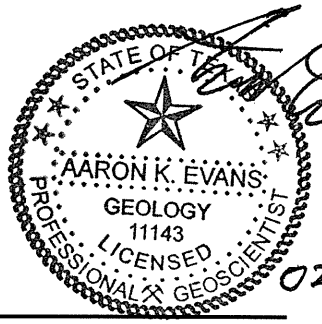


(Engineer's seal pertains to non-italicized text in Section 10 of Appendix I/IIC.)

(Geoscientist's seal pertains to italicized text in Section 10 of Appendix I/IIC.)



10.1 Introduction

The location restriction criteria in Title 30 TAC §330.559 require engineering measures to be incorporated into the design of a disposal unit located in an unstable area to ensure that the integrity of the structural components of the disposal unit will not be disrupted. Unstable areas, by definition, are areas susceptible to natural or human-induced events or forces that are capable of impairing the integrity of some or all structural components (i.e., liner systems, leachate collection systems, and final cover systems) of a disposal unit. Unstable areas can include poor foundation conditions, areas susceptible to mass movement, or karst terrain.

These three potential unstable area conditions are discussed in the following three subsections.

10.2 Foundation Conditions

10.2.1 Bottom Liner Foundation Condition

As described in Appendix IIIG – Geology Report, the Lower Sand Unit and saturated portion of the Bounding Shale Unit represent the uppermost aquifer at the site, which primarily consists of sand, sandstone, and sandy shale. The proposed landfill excavation grades (in addition to the existing fill area) are founded in the Bounding Shale Unit. A foundation settlement analysis is included in Appendix IIIE (Appendix IIIE-B) to verify that the amount of consolidation of the natural soils below the site will not adversely affect the integrity of the existing and future liner systems. As noted in Appendix IIIE, the strain on the liner system caused by differential settlement is within acceptable limits for the liner system materials. In addition, the bottom liner leachate collection system design, included in Appendix IIIC, has been developed to account for settlement. As demonstrated in Appendix IIIC, the leachate collection system will function as designed after the settlement of the foundation soils has occurred.

On-site and local geologic and geomorphologic features were evaluated as part of Appendix IIIG for naturally induced events or forces that would have the potential to affect the integrity of the landfill or the landfill's components. No potential for subsidence due to local groundwater withdrawal was identified in this evaluation. According to the water well searches performed by GeoSearch and WCG, the area within a one-mile radius of the landfill receives domestic, irrigation, process, and stock water obtained from water wells screened in the Woodbine Aquifer and domestic,

process, and public supply water obtained from water wells screened in the deeper Trinity Aquifer. The potential for unstable areas due to subsidence was evaluated based on area groundwater use and salt karst dissolution potential. Although the regional drawdown of water in the Woodbine and Trinity aquifers has been noted in the regional investigatory literature published by the Texas Water Development Board, no subsidence has been noted or reported in the landfill vicinity. For these reasons, there is no existing potential for landfill subsidence due to groundwater withdrawal.

In addition, no potential for subsidence due to natural gas and crude oil production was identified. In August 2021, there were 41 Barnett Shale natural gas well surface penetrations and no oil wells identified within one mile of the landfill's permit boundary reported in the Texas Railroad Commission's online database at http://wwwgisp.rrc.texas.gov/GISViewer2/. These natural gas wells penetrate strata to depths exceeding 7,000 feet below grade and are deviated to a horizontal trend through the Barnett Shale gas reservoir. Although deep brine groundwater is commonly produced during Barnett Shale gas exploration, the gas well development process includes high pressure fracturing of the formation using water and sand which would replace removed brine water. The Mississippian-age Barnett Shale rocks are hard, competent, and incompressible. Therefore, the potential for subsidence due to natural gas and brine water withdrawal is insignificant.

Given the above, it is concluded that no natural or human-induced event or forces will adversely affect the landfill or the landfill components.

10.2.2 Final Cover Foundation Condition

The geotechnical design in Appendix IIIE includes demonstrations that the proposed final cover system will function as designed after the final settlement of waste placed below the final cover area is complete. The demonstrations also include a strain analysis showing that the differential settlement of waste will not be detrimental to the final cover system and the maximum estimated strain will be below allowable strain values for each final cover system component.

10.3 Mass Movement

The geotechnical design in Appendix IIIE includes an analysis that the mass movement of natural soils and the landfill will not occur at the site. A detailed summary of the slope stability analyses is provided in Section 6 of Appendix IIIE. The analyses show that the excavated and constructed slopes will be stable. The analyses incorporate various interim fill conditions and the final configuration condition of the landfill. The results of the stability analyses indicate that the proposed excavation, constructed liner, interim waste fill slopes, and final configuration slopes are stable under the conditions analyzed. The results of the stability analyses demonstrate that the calculated factor of safety values are higher than the recommended minimum factor of safety. The recommended minimum

factors of safety for the conditions analyzed were determined using recommendations from the USACE "Design and Construction of Levees" manual (EM 1110-2-1913) and the EPA's "Technical Guidance Manual for Design of Solid Waste Disposal Facilities." An infinite slope stability analysis was also developed for the liner and final cover systems and are discussed in more detail in Section 6.5 of Appendix IIIE. The results of both the generalized slope stability and interface slope stability analyses indicate that the landfill and its components will be geotechnically stable as designed.

Furthermore, to ensure interface stability of the landfill components, the minimum interface strength requirements have been incorporated into the Appendix IIID – Liner Quality Control Plan for future bottom and overliner construction and Appendix IIIJ-A – Final Cover System Quality Control Plan for the future final cover system.

10.4 Karst Terrain

As discussed in Appendix IIIG of Part III, the site is located in the Black Prairie regional physiographic province. Most of the Black Prairie province is underlain predominately by Cretaceous-age sediments. Aaron K. Evans, P.G. (a WCG Texas licensed professional geoscientist) reviewed the Texas Speleological Survey Cave and Karst Database (2008), area USGS 7.5 Minute Topographic Quadrangle Maps (Alvarado, TX and Grandview, TX; 2016), Google Earth aerial imagery of Johnson County (accessed August 2021), site boring logs data, and performed onsite field investigations of the Turkey Creek Landfill and the surrounding areas (conducted from April 2021 to August 2021).

Based on review of the aforementioned references and field investigation from area roadways, no characteristic karstic map features are present, no surface indications of karst development were observed, and no karst topography or sinkholes exist in the site vicinity. Based on borehole data and regional stratigraphy, the conditions necessary for karst development (e.g., shallow unit of fractured or elevated porosity limestone) is not present in the area immediately beneath the landfill permit boundary.

10.5 Summary

In summary, the bottom liner system is founded in Stratum II sand and sandstone that will provide an excellent foundation layer. In addition, the final cover system is designed to ensure that the integrity of these systems will be maintained. The stability analysis shows that each landfill component will be stable and no mass movements will occur. *Finally, there is no evidence of karst development in the area.* The expanded site will continue to be in compliance with this location restriction.

Given the above, it is concluded that no natural or human-induced event or forces will adversely affect the landfill or the landfill components. This conclusion is based on a review of the site in its current state, site development, and the facility operations itself; there are no on-site local soil conditions, *geologic conditions, or geomorphologic features* as well as no human induced features or events (both surface and subsurface) that would result in significant differential settlement or other unstable conditions. Therefore, the site meets the requirements of Title 30 TAC §330.559.

11 COASTAL AREAS

The coastal areas location restriction within Title 30 TAC §330.561 requires that a new landfill cell or expansion of an existing cell of a landfill managing Class 1 Industrial Solid Waste not be located on a barrier island or peninsula, or within 1,000 feet of an active coastal shoreline erosion.

The Turkey Creek Landfill does accept Class 1 Industrial Solid Waste but is not located near the coast. Therefore, the site is in compliance with the coastal areas location restriction.

12 TYPE I AND TYPE IV LANDFILL PERMIT ISSUANCE PROHIBITED

The Type I and Type IV Landfill Permit Issuance Prohibited location restriction within Title 30 TAC §330.563 prohibits the issuance of a permit for a Type IV landfill that is located within 100 feet of a canal that is used as a public drinking water source or for irrigation of crops used for human or animal consumption or that is located in a county with a population of more than 225,000 that is located adjacent to the Gulf of Mexico. The location restriction also prohibits the issuance of a permit for a new Type I or Type IV landfill or a permit amendment authorizing the conversion of a Type IV landfill to a Type I landfill only if the landfill is located adjacent to a county with a population of more than 3.3 million and inside the boundaries of a national forest, as designated by the United States Forest Service, on public or private land.

Given that the Turkey Creek Landfill is a Type I landfill and is not located inside the boundaries of a national forest, the site is in compliance with the Type I and Type IV landfill permit issuance prohibited location restriction.

APPENDIX I/IID

TRAFFIC STUDY

Weaver Consultants Group

January 18, 2022
Project No. 0771-368-11-123

Mr. Carl Johnson, P.E.
District Engineer
Texas Department of Transportation, Fort Worth District
2501 SW Loop 820
Fort Worth, Texas 76133

Re: Engineering Study
Turkey Creek Landfill
Johnson County, Texas

Dear Mr. Johnson:

The purpose of this letter, submitted on behalf of Texas Regional Landfill Company, LP, a wholly owned subsidiary of Waste Connections, Inc., is to demonstrate coordination with the Texas Department of Transportation (TxDOT), consistent with Title 30 TAC §330.61(i)(4). This regulation requires that an applicant for a municipal solid waste (MSW) facility coordinate with TxDOT regarding any potential traffic or location restrictions.

Weaver Consultants Group, LLC is preparing a Major Permit Amendment for an existing Type I municipal solid waste (MSW) facility, under contract with Texas Regional Landfill Company, LP to obtain the necessary authorization to expand the existing Turkey Creek Landfill. The existing Turkey Creek Landfill has limited remaining disposal capacity, and the proposed expansion will extend the ability of Texas Regional Landfill Company, LP to collect, process, and dispose of solid waste for Johnson County and surrounding areas. The existing site entrance is located off the southbound Interstate Highway 35 West (IH-35W) Frontage Road immediately north of State Road 107, in Johnson County, Texas.

To assist you in your review, a project summary and site location maps have been provided as an overview of the Major Permit Amendment.

The attached traffic study demonstrates that the site access roads – Interstate 35W, Farm to Market Road 2415, and County Roads 313, 204 and 107 – will provide adequate access to the site now and in the foreseeable future. The landfill has been in operation for many years and the traffic patterns of the solid waste collection vehicles that use area access roads are well established. As a result of the proposed expansion, the volumes of vehicles on the roadway system and into the facility will not increase, and the existing entrance will not be modified. It is expected that the

traffic patterns will remain consistent with the current traffic patterns. Additionally, please note a permit is not being requested from TxDot for this project. A traffic impact analysis (TIA) is not warranted for the proposed landfill expansion.

To verify compliance with Title 30 TAC §330.61(i)(4), we are required by TCEQ to include a letter from TxDOT in the TS application regarding the adequacy of the site access roads and any traffic or location restrictions at or near the site.

Please call if you have any questions or need additional information.

Sincerely,
Weaver Consultants Group, LLC

Charles R. Marsh, P.E.
Project Director

Attachments: Executive Summary
Turkey Creek Landfill Engineering Study

cc: Gary Bartels, Texas Regional Landfill Company, LP
Nevzat Turan, Weaver Consultants Group, LLC

EXECUTIVE SUMMARY
TURKEY CREEK LANDFILL PROPOSED EXPANSION
ENGINEERING ANALYSIS

This Executive Summary has been prepared for the Engineering Study developed to evaluate the adequacy of the roadways serving the Turkey Creek Landfill Facility (Facility) located in Johnson County, Texas. The Engineering Study generally makes the following conclusions:

- The proposed expansion of the Facility will not increase the volume of trucks entering or exiting the Facility from existing roadways. If completed, the proposed expansion will extend the life of the facility.
- The Facility is currently accessed by a driveway located off of the IH35W frontage road, and via Exit 21 from IH35W.
- The two driveways that serve the facility are each one-way in and one-way out and are separated by a median measuring approximately 160 feet.
- The proposed Facility expansion will not alter the driveways or the entrance to the Facility.
- A permit is not being requested from TxDOT for the proposed expansion. However, it is being requested that TXDOT offer a Letter of No Objection if it is demonstrated that the project meets the requirements of 30 TAC §330.61(i).

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

ENGINEERING STUDY

Prepared for

Texas Regional Landfill Company, LP

January 2022



Prepared by

Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Blvd., Suite 206
Fort Worth, Texas 76109
817-735-9770

Project No. 0771-368-11-122-01

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	1.2	Summary of Proposed Landfill Expansion	1
2	**TRAFFIC INFORMATION**		**3**
	2.1	Availability and Adequacy of Roads	3
	2.2	Volume of Vehicular Traffic	3
3	**COMPLIANCE WITH HIGHWAY BEAUTIFICATION ACT**		**10**

APPENDIX A
Project Summary and Site Location Maps



1 INTRODUCTION

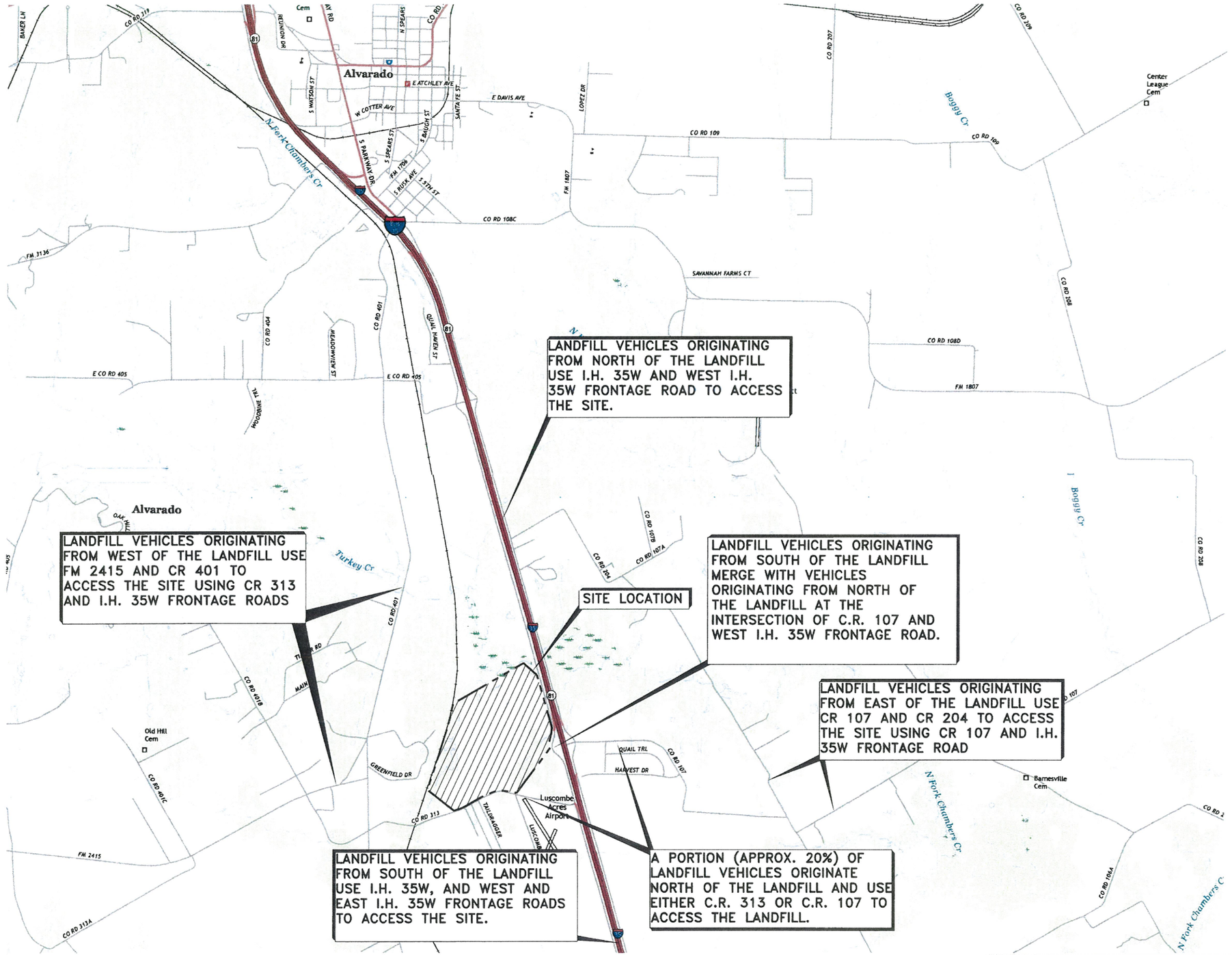
1.1 Purpose

Weaver Consultants Group, LLC is in the process of developing a Major Permit Amendment Application, on behalf of Texas Regional Landfill Company, LP, to authorize the future expansion of the Turkey Creek Landfill. The purpose of this study is to demonstrate that the access roads to the Turkey Creek Landfill (IH-35W, County Roads 313, 107, 204, and 401, and Farm to Market Road 2415) will provide excellent access to the site. The Engineering Study is completed consistent with the requirements listed in 30 TAC §330.61(i), which requires the following information.

- Provide data on the availability and adequacy of roads that the owner or operator will use to access the site;
- Provide data on the volume of vehicular traffic on access roads within one mile of the proposed facility, both existing and expected, during the expected life of the proposed facility;
- Project the volume of traffic expected to be generated by the facility on the access roads within one mile of the proposed facility; and
- Submit documentation of coordination of all designs of proposed public roadway improvements such as turning lanes, storage lanes, etc., associated with site entrances with the agency exercising maintenance responsibility of the public roadway involved. In addition, the owner or operator shall submit documentation of coordination with the Texas Department of Transportation for traffic and location restrictions.

1.2 Summary of Proposed Landfill Expansion

Turkey Creek Landfill is an existing municipal solid waste landfill located in Johnson County, Texas at the northwest corner of the intersection of IH-35W and County Road 313. The current landfill waste disposal unit is approximately 146.5 acres. The proposed permit amendment includes a horizontal and vertical expansion of the existing permitted waste disposal footprint area. The proposed horizontal expansion includes two areas (western and eastern) with a total area of approximately 26.0 acres. The proposed vertical expansion will increase the currently permitted maximum final cover elevation by 50-feet from a current peak elevation of 946 ft-msl to 996 ft-msl. The proposed expansion areas are located entirely within the existing 219.6-acre permit boundary.



STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED
PROFESSIONAL ENGINEER
1-18-22

ALVARADO, TX
2016

GRANDVIEW, TX
2016

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 14S
10 000-foot ticks: Texas Coordinate System of 1983 (north central zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, July 2014
Roads..... U.S. Census Bureau, 2014 - 2015
Names.....GNIS, 2015
Hydrography.....National Hydrography Dataset, 2014
Contours.....National Elevation Dataset, 2004
Boundaries.....Multiple sources; see metadata file 1972 - 2015

Wetlands.....FWS National Wetlands Inventory 1977 - 2014

NOTES:

1. REPRODUCED FROM 2016 USGS 7.5 QUADRANGLES: ALVARADO AND GRANDVIEW.

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REVIEWED BY: CRM

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PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

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MAJOR PERMIT AMENDMENT SITE LOCATION MAP AND TRAFFIC PATTERNS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1-1

O:\0771\368\EXPANSION 2021\TRAFFIC\1-1 TxDOT.dwg, jpuhr, 1:2

2 TRAFFIC INFORMATION

2.1 Availability and Adequacy of Roads

As shown on Figure 2-1, the roads within one mile of the site are IH-35W (multi-lane, divided, 75 mph freeway), IH-35W frontage roads (two-lane, 50 mph asphalt-paved), County Roads (CR) 313, 107, 204, and 401, and Farm to Market (FM) Road 2415 (all are two-lane, asphalt-paved, 30 to 40 mph). IH-35W is the main access road that waste collection vehicles will use to access the site via the western frontage road of IH-35W. Exit 21 allows for direct access to the landfill entrance from IH-35W. The site access roads are IH-35W, CR 401, 107, 204, 313, and FM 2415 as the majority of traffic in- or outbound from the landfill will utilize these roads. Other nearby roads may be periodically used by landfill vehicles to serve residences and businesses located along or near there roadways.

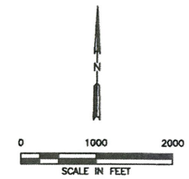
The Turkey Creek Landfill site access road enters the landfill at the southeast corner of the site via Exit 21 from IH-35W. CR 313 and CR 107 both intersect the IH-35W frontage road southeast of the site entrance. IH-35W is a four-lane, divided, controlled access expressway. A secondary site entrance used only intermittently by heavy construction vehicles is on CR 313 on the southside of the site between CR 401 and IH-35W. CR 313, CR 107, CR 204, and CR 401 are two-lane, asphalt-paved county roads. FM 2415 is also a two-lane, asphalt-paved road. Figure 2-2 provides an overview of the site entrances.

The existing entrance to the landfill is shown on Figure 2-3. As shown on Figure 2-3, the site entrance includes an approximately 50-foot-wide concrete road from the western IH-35W frontage road to the scalehouse. The length of the entrance road is approximately 440 feet, which provides a more than ample queuing area for waste vehicles, as noted in Section 2.3.

2.2 Volume of Vehicular Traffic

The volume of vehicle traffic on the site access roads (IH-35W, CR 401, CR 107, CR 204, CR 313, and FM 2415), are summarized on Table 2.1. As noted on Table 2.1, TxDOT traffic counts from 2019 were available for all site access roads. The TxDOT traffic counts were adjusted to 2021 traffic conditions to account of the additional traffic created by area growth between the time volume data was collected and 2021. In summary, all access roads operate at a Level of Service (LOS) of C or better throughout the projected life of the site. Only one road, CR 401, decreases in LOS from 2021 to 2036, and this decrease is only from A to B. All access roads will provide adequate access to the landfill.





LEGEND

- LANDFILL PERMIT BOUNDARY
- LIMITS OF WASTE
- 1 MILE COVERAGE AREA

Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route



ALVARADO, TX
2016

GRANDVIEW, TX
2016

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 14S
10 000-foot ticks: Texas Coordinate System of 1983 (north central zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, July 2014
Roads..... U.S. Census Bureau, 2014 - 2015
Names.....GNIS, 2015
Hydrography.....National Hydrography Dataset, 2014
Contours.....National Elevation Dataset, 2004
Boundaries.....Multiple sources; see metadata file 1972 - 2015

Wetlands.....FWS National Wetlands Inventory 1977 - 2014

NOTES:

1. REPRODUCED FROM 2016 USGS 7.5 QUADRANGLES: ALVARADO AND GRANDVIEW.

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DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
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MAJOR PERMIT AMENDMENT
FACILITY ACCESS ROADS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2-1

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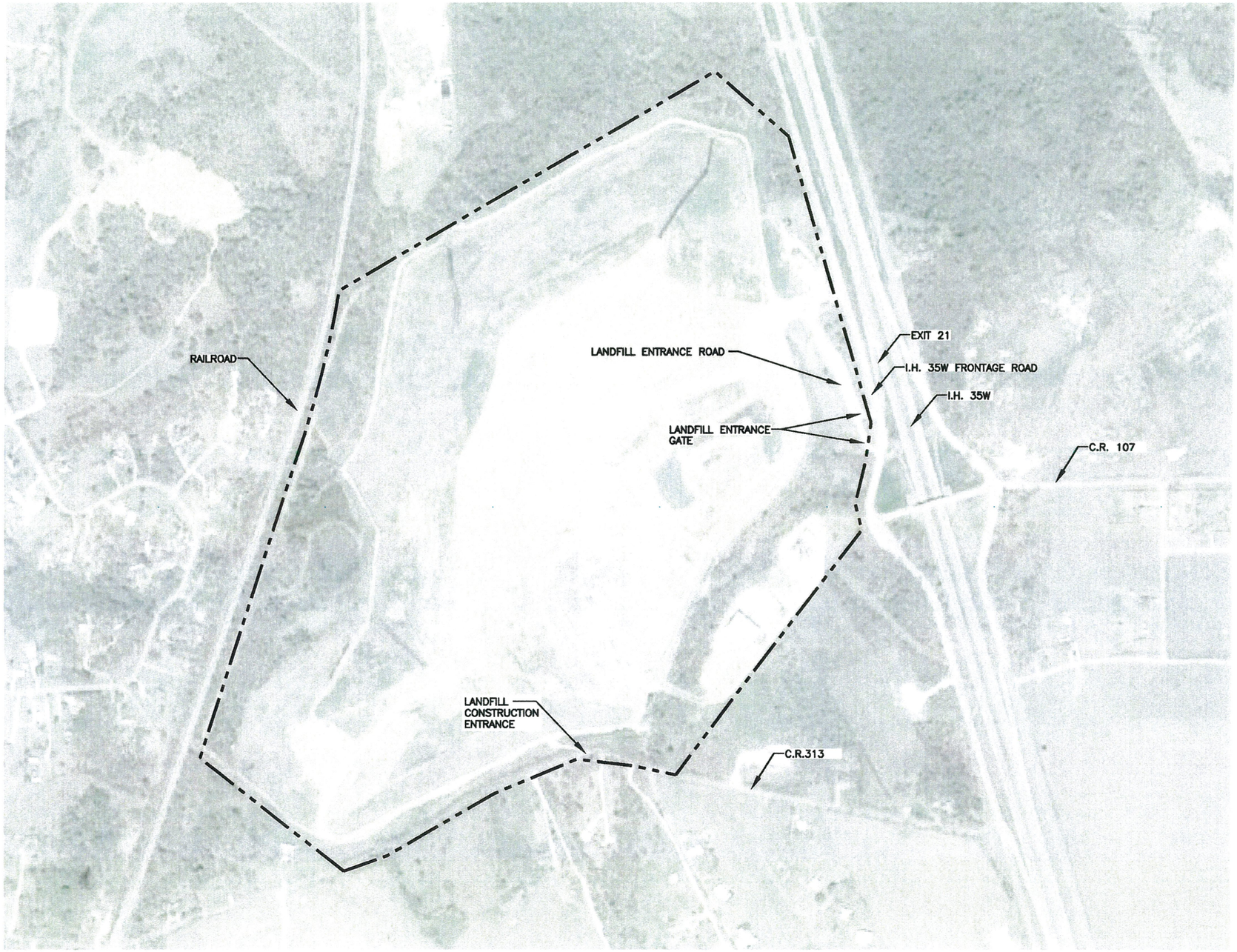
O:\0771\368\EXPANSION 2021\TRAFFIC\2-1 ACCESS ROAD.dwg, jpuhr, 1:2



N

0 300 600

SCALE IN FEET

LEGEND

LANDFILL PERMIT BOUNDARY

STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED PROFESSIONAL ENGINEER
1.18.22

NOTES:

1. AERIAL IMAGERY PROVIDED BY GOOGLE EARTH, DATED MARCH 21, 2018.

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NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
ENTRANCE ROAD

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2-2

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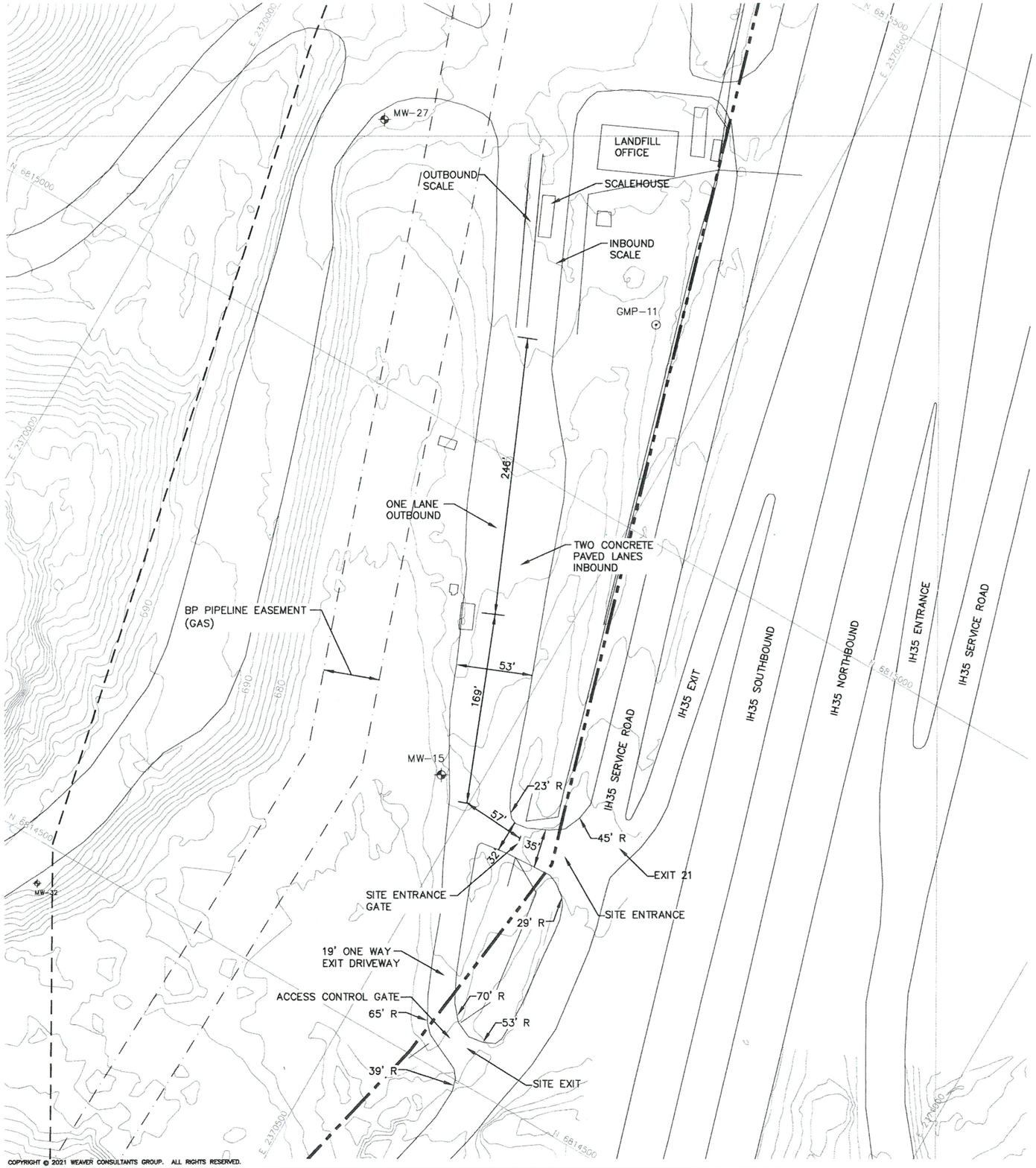

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N

0 50 100
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- 680 EXISTING CONTOUR
- N 6814500 STATE PLANE COORDINATE
- EASEMENT
- FENCE
- MW-15 EXISTING GROUNDWATER MONITORING WELL

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

STATE OF TEXAS
CHARLES R. MARSH
105073
LICENSED
PROFESSIONAL ENGINEER
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MAJOR PERMIT AMENDMENT
ENTRANCE FACILITY PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2-3

O:\0771\368\EXPANSION 2021\TRAFFIC\2-3 ENTRANCE FACILITY.dwg, jpuhr, 1:2

TURKEY CREEK LANDFILL
PROPOSED EXPANSION
TRAFFIC STUDY
Table 2.1
2-Way Traffic Volumes

Location	2021 Traffic Conditions[1,2]						Projected 2036 Traffic Conditions[2]					
	Daily			Peak Hour[3]			Daily			Peak Hour[3]		
	Landfill Trips[4]	Non-Landfill Trips	Total	Landfill Trips	Non-Landfill Trips	Total	Landfill Trips[4]	Non-Landfill Trips	Total	Landfill Trips	Non-Landfill Trips	Total
Interstate Highway 35W North of Landfill	1,081	42,896	43,977	108	4,290	4,398	1,327	52,560	53,887	133	5,256	5,389
Interstate Highway 35W South of Landfill	1,081	41,136	42,217	108	4,114	4,222	1,327	50,403	51,730	133	5,040	5,173
County Road 401	1,081	1,407	2,488	108	141	249	1,327	1,722	3,049	133	172	305
County Road 204	108	156	264	11	16	26	133	191	324	13	19	32
County Road 107	108	240	348	11	24	35	133	294	427	13	29	43
County Road 313	108	559	667	11	56	67	133	684	817	13	68	82
Farm to Market Road 2415	1,081	1,465	2,547	108	147	255	1,327	1,794	3,120	133	179	312

Notes:

[1] 2021 Traffic conditions are based on volumes provided on the TxDOT 2019 District Traffic Map. These volumes are projected using population growth rates in the NCTCOG North Central Texas 2030 Demographic Forecast.

[2] The annual population growth rate is 1.36% for 2011-2020, 1.02% for 2021-2030, and 0.93% for 2031-2040.

[3] Peak hour volumes are assumed to be ten percent of the total daily traffic volume.

[4] 2021 Landfill trips were estimated from information provided by the site operator. Projected landfill trips were calculated based on the projected waste inflow rate. The number of inbound trips per day was calculated based on truck capacity, density, ton and the current breakdown of landfill vehicle types. The inbound volume was doubled to obtain the number of total daily two-way landfill trips.

[5] It is conservatively assumed that 100 percent of all landfill traffic will travel IH-35W (north of landfill), IH-35W (south of landfill), CR 401, and FM 2415. Assume 10 percent of landfill traffic will use CR 204, CR 107, and CR 313).

24-Hour One-Way Landfill Vehicle Estimates

Vehicle Description	2021 Conditions					2036 Conditions				
	Truck Capacity (yd^3)	Waste Density (lb/yd^3)	Truck Capacity (tons)	Distribution of Waste Stream (tons)	Estimated Vehicle Counts (vehicles/day)	Truck Capacity (yd^3)	Waste Density (lb/yd^3)	Truck Capacity (tons)	Distribution of Waste Stream (tons)	Estimated Vehicle Counts (vehicles/day)
Read Loader	20	500	5.0	720	144	20	500	5.0	883	177
Front Loader	40	500	10.0	825	83	40	500	10.0	1012	101
Rolloffs	30	267	4.0	600	150	30	267	4.0	736	184
Transfer Trailers	125	400	25.0	840	34	125	400	25.0	1031	41
Private	-	-	0.25	15	60	-	-	0.25	18	74
Subtotal:	--	--	--	3,000	470				3,681	577
Facility Personnel/Misc. [1]	--	--	--	--	71	-	-	-	--	87
Total:	--	--	--	**3,000**	**541**				**3,681**	**663**

Notes:

[1] Facility personnel and miscellaneous vehicle count estimates were assume to be approximately 15% of the total vehicles.

Table 2.2
Traffic Impact Assessment[1]

Location	Roadway Capacity (veh/hr)	2021 Traffic Conditions						Projected 2036 Traffic Conditions					
		Total Volume (vpd)	Landfill Vehicles (vpd)	Peak Hour Volume[2] (veh)	% of Roadway Capacity used	LOS[1]	% of Roadway Capacity Used by Landfill Vehicles	Total Volume (vpd)	Landfill Vehicles (vpd)	Peak Hour Volume[2] (veh)	% of Roadway Capacity used	LOS[1]	% of Roadway Capacity Used by Landfill Vehicles
Interstate Highway 35W North of Landfill	6,400	43,977	812	4,398	68.7%	C	1.3%	53,887	1,190	5,389	84.2%	C	1.9%
Interstate Highway 35W South of Landfill	6,400	42,217	812	4,222	66.0%	C	1.3%	51,730	1,190	5,173	80.8%	C	1.9%
County Road 401	3,200	2,488	812	249	7.8%	A	2.5%	3,049	1,190	305	9.5%	B	3.7%
County Road 204	3,200	264	81	26	0.8%	A	0.3%	324	119	32	1.0%	A	0.4%
County Road 107	3,200	348	81	35	1.1%	A	0.3%	427	119	43	1.3%	A	0.4%
County Road 313	3,200	667	81	67	2.1%	A	0.3%	817	119	82	2.6%	A	0.4%
Farm to Market Road 2415	3,200	2,547	812	255	8.0%	B	2.5%	3,120	1,190	312	9.8%	B	3.7%

Notes:

[1] Level of Service for Interstate Highway 35W, County Road 401, County Road 107, County Road 204, County Road 313, and Farm to Market Road 2415 is determined based on average travel speed from Reference 1, Chapter 15.

[2] Peak hour volumes are assumed to be ten percent of the total daily traffic volume.

3 COMPLIANCE WITH HIGHWAY BEAUTIFICATION ACT

The Texas Transportation Code (TTC) Chapter 391 outlines compliance conditions and regulations to ensure that areas adjacent to interstate and primary transportation systems in Texas comply with the Highway Beautification Act (HBA), 23 U.S.C. §131, 136, and 319. In the context of the HBA, landfills are classified as junk yards, and no junk yard may be established within 1,000 feet of the right-of-way of a highway in the interstate or primary systems. The rights-of-way of IH-35W and Johnson County Roads 313 and 107 are within 1,000 feet of the permit boundary of the Turkey Creek Landfill. However, based on the definitions set forth in HBA and TTC, it is understood that the landfill will be appropriately screened from the roadway by providing adequate vegetation over the final cover areas and screening trees or bushes as needed. Therefore, the requirements set forth in the HBA would be implemented appropriately at the Turkey Creek Landfill.

The design and operating requirements listed in the Major Permit Amendment Application to the Texas Commission on Environmental Quality (TCEQ) were developed to meet the intent of the screening standards for landfills set forth in the TxDOT Right of Way Manual (Volume 7 – Beautification, Chapter 10 – Control of Junkyards). According to the TxDOT Right of Way Manual, landfills will be considered appropriately screened by:

- Fencing the landfill area;
- Confining the refuse to the smallest practical area;
- Reducing the refuse to the smallest practical volume; and
- Covering the refuse with a layer of earth at the conclusion of each day's operation or at more frequent intervals if necessary.

A summary of each of these requirements is listed in Table 3-1.

Table 3-1
Turkey Creek Landfill Expansion
Landfill Screening Requirements

TxDOT Screening Requirements	Existing and Proposed Site Design or Permit Operating Condition
Fencing the Landfill Area	The Turkey Creek Landfill is currently fenced around the entire permit boundary, and access into the site is restricted to the entrance road in the southeast corner and south access point.
Confining the Refuse to the Smallest Practical Area and Volume	Solid waste at the Turkey Creek Landfill is disposed of at the working face of the landfill. The working face is the only portion of the disposal area containing exposed solid waste. The size of the working face is required to be confined to as small of an area as practical. Specific working face size limitations are included in the existing and proposed Site Operating Plan.
Covering the Refuse with a Layer of Earth at the Conclusion of Each Day's Operation or at More Frequent Intervals in necessary	The Site Operating Plan mandates that at least once every 24 hours, exposed solid waste will be covered by at least six inches of earthen cover material or by TCEQ-approved alternate daily cover material. Additionally, areas that have received daily cover and become inactive for at least 180 days will receive an additional six inches of well-compacted cover material. This intermediate cover will be graded and seeded such that sustainable vegetation is established on these inactive areas. The erosion control plan for the Turkey Creek Landfill outlines inspection and maintenance requirements designed to maintain the vegetation of the intermediate cover.

APPENDIX A

PROJECT SUMMARY AND SITE LOCATION MAPS

Project Summary
Turkey Creek Landfill Expansion
Johnson County, Texas

Introduction

Texas Regional Landfill Company, LP is in the process of developing a major permit amendment application to obtain authorization for an expansion of the existing Turkey Creek Landfill. This landfill expansion project will provide long-term disposal capacity for municipal solid waste that is generated in the area. The permit application will be submitted to the Texas Commission on Environmental Quality (TCEQ). The application will undergo a detailed review by the TCEQ before the permit for this facility is issued.

The objective of this summary is to provide an overview of the proposed landfill expansion. The following subsections detail information regarding the owner and operator of the site, general site information, and a summary of the proposed site design.

Owner/Operator Information

The Turkey Creek Landfill is owned and operated by Texas Regional Landfill Company, LP (previously IESI TX Landfill, LP), a subsidiary of Waste Connections, Inc. Waste Connections, Inc. is one of the leading providers of solid waste services in the nation and provides services to residential, municipal and commercial customers across the country.

Site Information

The following drawings are attached to this summary.

- Figure 1 – Site Location Map. This drawing shows the site location on a standard TxDOT county highway map.
- Figure 2 – General Topographic Map. This drawing shows the existing permitted landfill permit boundary and the limits of disposal area on a USGS map.
- Figure 3 – Aerial Photograph. This figure details the existing permitted landfill permit boundary and limits of waste disposal area on an aerial photograph.
- Figure 4 – Site Plan. This plan highlights the existing permitted landfill permit boundary and the limits of disposal area on a detailed topographic map.
- Figure 5 – Existing and Proposed Landfill Completion Plan. This Plan provides a comparison between the currently permitted landfill and the proposed changes to the landfill completion plan.

Site History

The Turkey Creek Landfill is an existing 219.6-acre municipal solid waste (MSW) landfill (TCEQ Permit No. MSW-1417C) located approximately 2.5 miles south of the City of Alvarado in Johnson County, Texas. The site was originally permitted as a 91-acre Type I MSW disposal facility in 1983 (Permit No. MSW-1417). A permit amendment (MSW-1417A) was issued in 1988 which did not add acreage, but made more efficient use of the permitted area. The permit was amended in 1991 (Permit No. MSW-1417B). This amendment increased the permit boundary to its currently permitted acreage (219.6 acres). The permit was amended again in 2020 (Permit No. MSW-1417C). This amendment increased the height from 834 feet mean sea level (ft-msl) to 946 ft-msl. The currently permitted waste disposal footprint is approximately 146.4 acres.

Design Summary

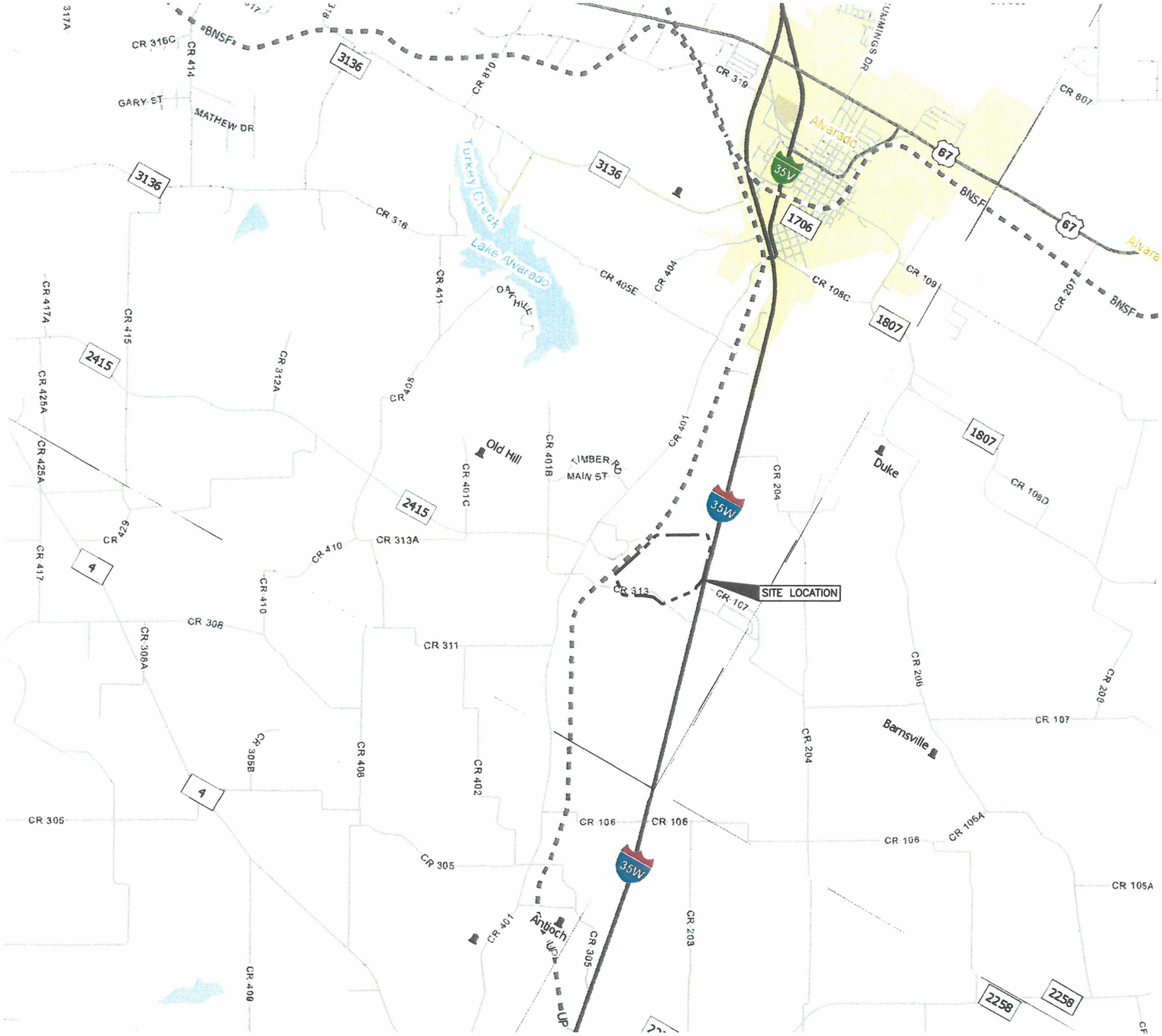
The following information presents a summary of the design and operations of the proposed Turkey Creek Landfill expansion.

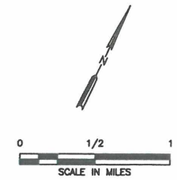
- The Turkey Creek Landfill is an existing Type I municipal solid waste landfill facility (MSW Permit No. MSW-1417C). The existing landfill currently serves residences and businesses in the communities of Johnson County and nearby counties.
- With this expansion, the existing 219.6-acre permit boundary footprint will not be expanded. The permitted limits of waste will be expanded from approximately 146.4 acres to approximately 172.0 acres. The current peak elevation of 946 feet mean sea level (msl) will be expanded vertically to 996 feet msl.
- Accepted wastes will remain consistent with the current municipal solid waste landfill permit. The major classifications of solid waste to be accepted at the Turkey Creek Landfill include household waste, yard waste, commercial waste, industrial waste (nonhazardous), construction-demolition waste, and some special wastes as approved by TCEQ.
- Access to the site will be provided via the existing site access roads. Based on travel patterns of existing landfill traffic, vehicles bound for the landfill will generally access the site using I-35W and the I-35W frontage road. which is capable of handling the loads associated with landfill traffic.
- A liner and final cover system that meets all regulatory requirements will be used for the solid waste containment system. The design objective of the containment system (final cover, liner, and leachate management systems) is to isolate the solid waste and remove leachate (defined as liquid that has contacted solid waste) that may collect on the liner system. Collected leachate will be stored on-site then transferred to an authorized treatment facility, handled on-site in accordance with the liquid stabilization program, or recirculated to areas with composite liners for use as a compaction aid in the working face. The construction procedures of the liner and cover systems follow strict TCEQ-approved quality control procedures,

which are performed by a qualified independent licensed professional engineer specialized in landfill construction quality assurance. Each of the containment system components must be thoroughly reviewed and approved by the TCEQ before solid waste is placed in the landfill.

- To control landfill gas (LFG) emissions and minimize the potential for subsurface migration a LFG collection and control system (GCCS) has been installed at the site. The collection system currently consists of vertical extraction wells and collection piping throughout the waste mass. The collected LFG is conveyed to a nearby plant and converted to energy or conveyed to a LFG flare where it is combusted. The existing LFG system will continued to be expanded to collect LFG from the currently permitted but undeveloped waste fill footprint and the horizontal expansion areas. Routine monitoring of the GCCS is performed to verify the efficiency of the GCCS to collect and control LFG.
- To verify that the highest level of environmental protection is provided, the following landfill monitoring systems are provided:
  - Groundwater Monitoring System. The purpose of the groundwater monitoring system is to verify the integrity of the containment system and verify that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining water samples from the monitor wells located on the perimeter of the landfill, which are screened in the upper most water table. The water samples are tested by an accredited third-party analytical laboratory.
  - LFG Detection System. The purpose of the LFG detection system is to verify that LFG does not migrate off-site. LFG detection probes have been installed along the current permit boundary perimeter.

  Each of these systems are sampled and tested periodically. The results are filed with the TCEQ and are public record.
- Site Operations. The site will be operated by personnel who have been trained and certified by the TCEQ. A detailed site operating plan will be included in the permit amendment application. The plan will detail the required equipment, personnel, and safety procedures required to operate the site in accordance with TCEQ regulations. The active landfill area will be covered at the end of each workday to prevent potential nuisance conditions such as odors and vectors. The Turkey Creek Landfill will continue to be inspected by the TCEQ on a regular basis to ensure the site is in compliance with state regulations.





LEGEND

PROPERTY/PERMIT BOUNDARY

- Unincorporated Community
- County Seat
- Border Crossing
- Cemetery
- Cemetery (Inside City)
- Deep Draft Port
- Shallow Draft Port
- Railroad
- Dam
- River or Stream
- TXDOT District
- Lakes
- Education
- Military
- Airport Runway
- Airport
- Prison
- Parks and Other Public Land

NOTE:

1. REPRODUCED FROM 2018 TEXAS DEPARTMENT OF TRANSPORTATION COUNTY MAPS, JOHNSON COUNTY.

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REVIEWED BY: CRM

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SITE LOCATION MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 1

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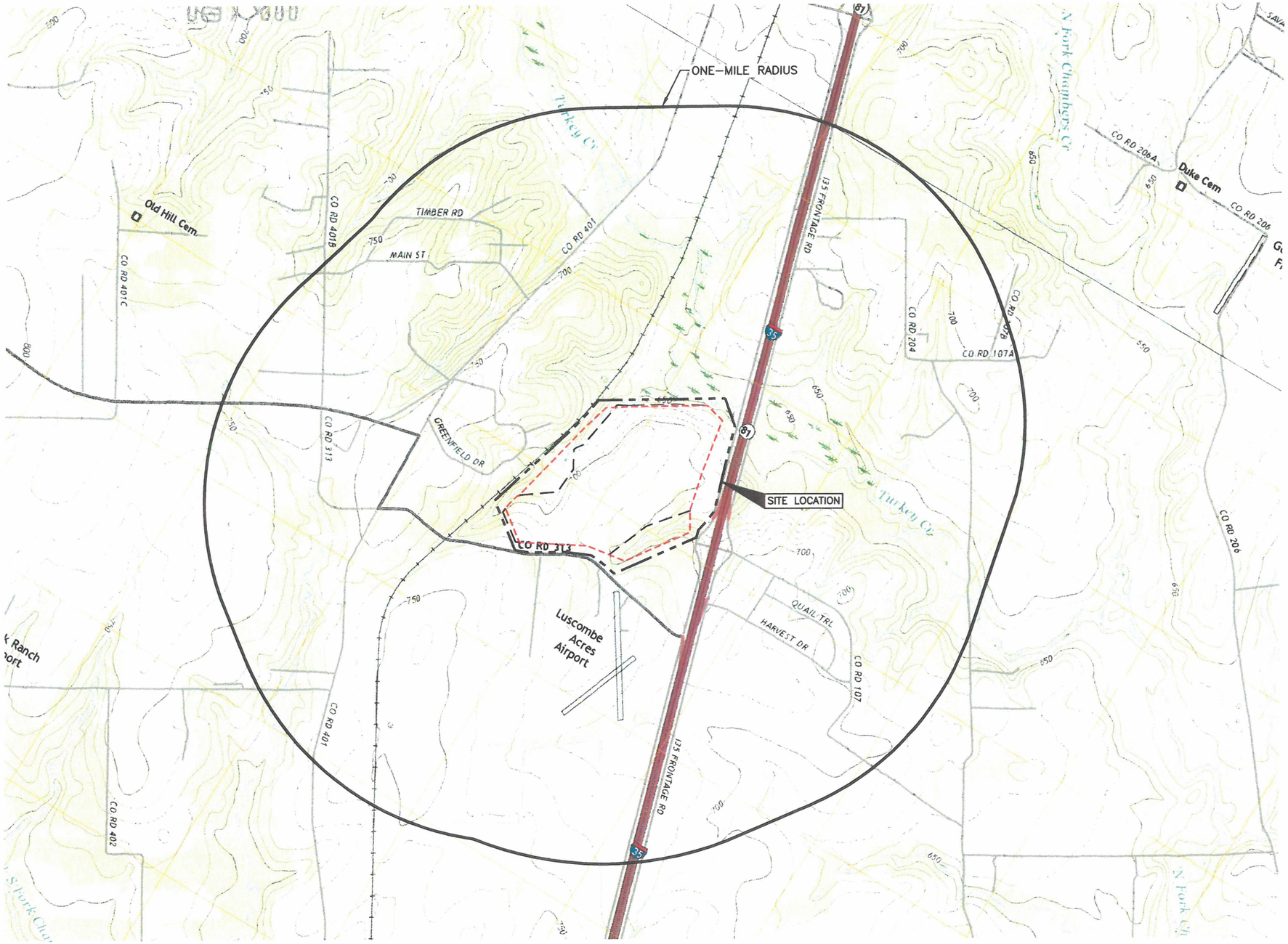

LEGEND

- PROPERTY/PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway, Secondary Hwy, Ramp, Local Connector, Local Road, 4WD

Interstate Route, US Route, State Route

ALVARADO, TX
2019

GRANDVIEW, TX
2019

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery	NAIP, September 2016 - November 2016
Roads	U.S. Census Bureau, 2015 - 2018
Names	GNIS, 1979 - 2018
Hydrography	National Hydrography Dataset, 2000 - 2018
Contours	National Elevation Dataset, 2003 - 2004
Boundaries	Multiple sources; see metadata file 2016 - 2017
Wetlands	FWS National Wetlands Inventory 1981

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 14S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery	NAIP, September 2016 - November 2016
Roads	U.S. Census Bureau, 2015 - 2018
Names	GNIS, 1979 - 2018
Hydrography	National Hydrography Dataset, 2002 - 2018
Contours	National Elevation Dataset, 2004
Boundaries	Multiple sources; see metadata file 2016 - 2017
Wetlands	FWS National Wetlands Inventory 1981

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DESIGN BY: DEP
REVIEWED BY: CRM

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GENERAL TOPOGRAPHIC MAP

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 2

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N

0 200 400

SCALE IN FEET

LEGEND

PROPERTY/PERMIT BOUNDARY
PERMITTED LIMITS OF WASTE
PROPOSED LIMITS OF WASTE

NOTES:

1. AERIAL IMAGERY PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.

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CAD: FIG 3-AERIAL PHOTOGRAPH.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

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TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

AERIAL PHOTOGRAPH

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 3

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O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 3-AERIAL PHOTOGRAPH.dwg, jwilson, 1:2



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- SECTOR BOUNDARY
- MW-7 — PERMITTED GROUNDWATER MONITORING WELL
- GMP-12 — PERMITTED GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 4-SITE PLAN.DWG

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DESIGN BY: MB
REVIEWED BY: CRM

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NO.	DATE	DESCRIPTION

SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 4

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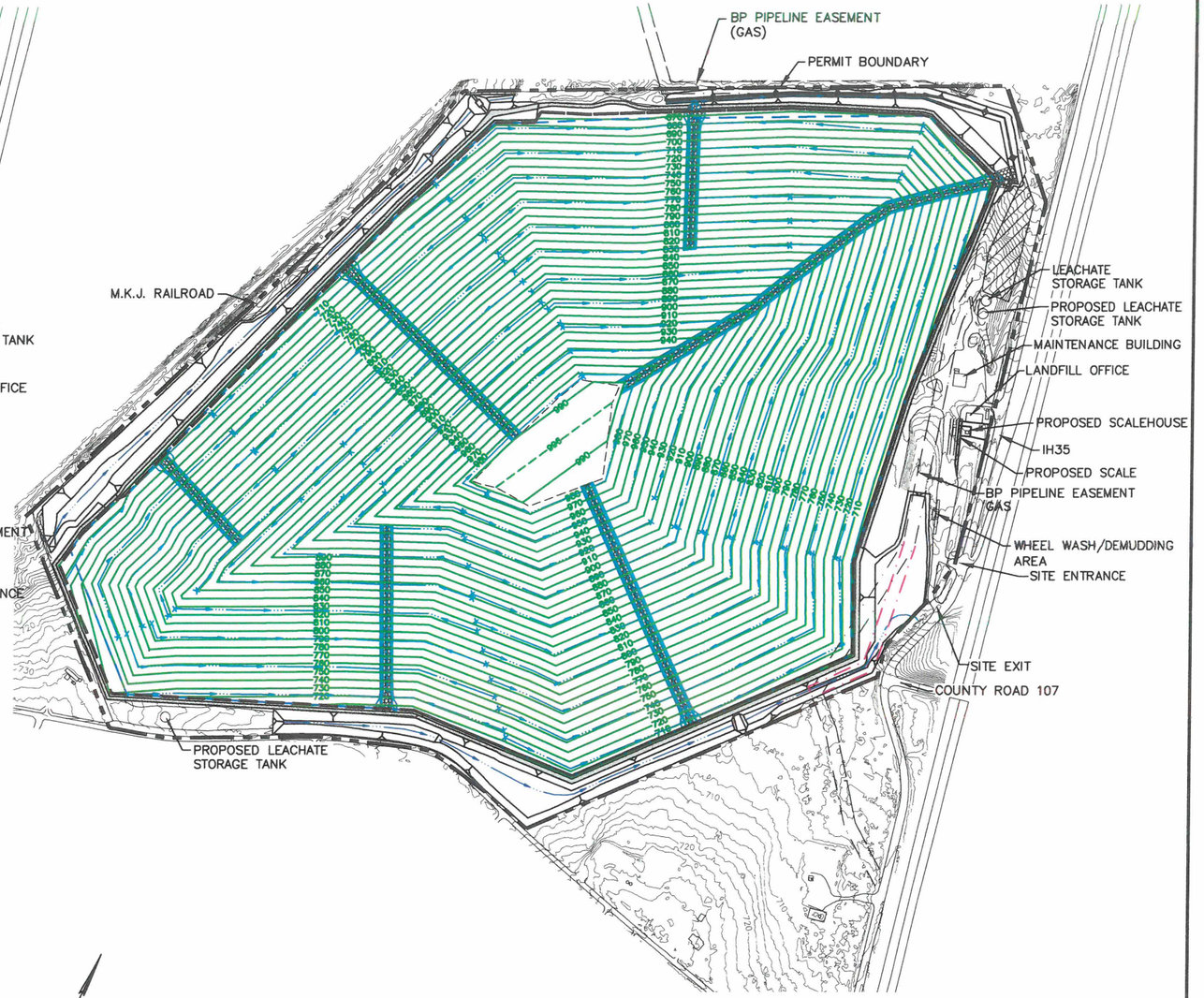
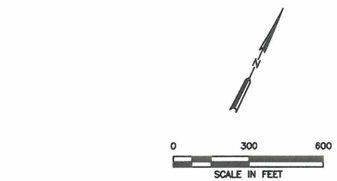
O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 4-SITE PLAN.dwg, jwilson, 1:2



PERMITTED LANDFILL COMPLETION PLAN



PROPOSED LANDFILL COMPLETION PLAN



LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 EXISTING CONTOUR
- EASEMENT
- PROPOSED EASEMENT (SEE NOTE 2)
- 870 FINAL COVER CONTOUR
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. THE PROPOSED EASEMENT SHOWN IS FOR VISUAL PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

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DATE: 12/2021
FILE: 0771-368-11
CAD: FIG 5-LANDFILL COMP. PLAN.DWG

DRAWN BY: RAA
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

EXISTING AND PROPOSED LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE 5

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O:\0771\368\EXPANSION 2021\PROJECT SUMMARY\FIG 5-LANDFILL COMPLETION PLAN.dwg, jwilson, 1:2

APPENDIX I/IIE

TPDES PERMIT

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Texas Pollutant Discharge Elimination System
Stormwater Multi-Sector General Permit

The Notice of Intent (NOI) for the facility listed below was received on November 8, 2021. The intent to discharge stormwater associated with industrial activity under the terms and conditions imposed by the Texas Pollutant Discharge Elimination System (TPDES) stormwater Multi-Sector General Permit (MSGP) TXR050000 is acknowledged. Your facility's unique TPDES MSGP stormwater authorization number is:

TXR05AP29

Coverage Effective: November 11, 2011
Sector: L Primary SIC code: 4953

TCEQ's stormwater MSGP requires certain stormwater pollution prevention and control measures, possible monitoring and reporting, and periodic inspections. Among the conditions and requirements of this permit, you must have prepared and implemented a stormwater pollution prevention plan (SWP3) that is tailored to your industrial site. As a facility authorized to discharge under the stormwater MSGP, all terms and conditions must be complied with to maintain coverage and avoid possible penalties.

Facility/Site Information:
RN100825462
Turkey Creek Landfill
9100 S Interstate 35 W
Alvarado, TX 76009
Johnson County

Operator:
CN601668486
Texas Regional Landfill Company, LP
3 Waterway Square Pl Ste 550
The Woodlands, TX 77380

The MSGP and all authorizations expire on August 14, 2026, unless otherwise amended. If you have any questions related to your application, you may contact the Stormwater Processing Center by email at SWPERMIT@tceq.texas.gov or by telephone at (512) 239-3700. For technical issues, you may contact the stormwater technical staff by email at SWGP@tceq.texas.gov or by telephone at (512) 239-4671. Also, you may obtain information on the TCEQ web site at https://www.tceq.texas.gov/goto/wq-dpa. A copy of this document should be kept with your SWP3.

Issued Date: November 08, 2021

FOR THE COMMISSION

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

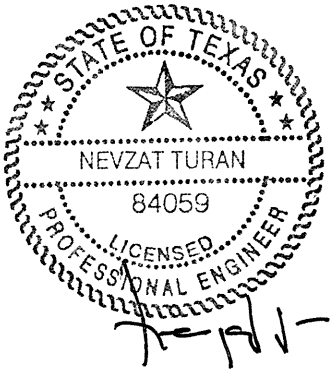
MAJOR PERMIT AMENDMENT APPLICATION

PART III – SITE DEVELOPMENT PLAN
SITE DEVELOPMENT PLAN NARRATIVE

Prepared for

Texas Regional Landfill Company, LP

February 2022



02/22/22

Prepared by

Weaver Consultants Group, LLC
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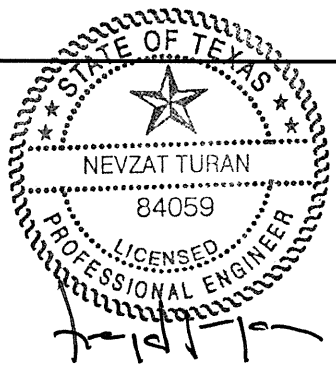
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-123

This document is intended for permitting purposes only.

CONTENTS



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APPENDIX IIIJ
Closure Plan

APPENDIX IIIK
Postclosure Care Plan

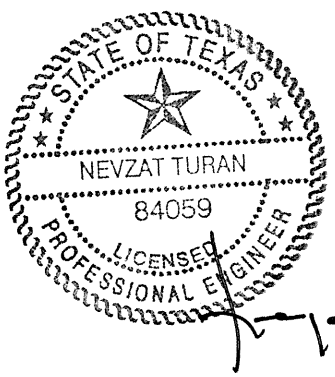
APPENDIX IIIL
Closure and Postclosure Care Cost Estimates



02/22/22

APPENDIX IIIM
Geotechnical Report

APPENDIX IIIN
Site Life Calculations



02/22/22

LIST OF ACRONYMS

ASTM – American Society for Testing and Materials

BER – Ballast Evaluation Report

BMPs – best management practices

CFR – Code of Federal Regulations

CLOMR – Conditional Letter of Map Revision

CMP – corrugated metal pipe

CN – curve number

COC – chain-of-custody

CQA – construction quality assurance

CU – consolidated-undrained

EDE – elevation of the deepest excavation

EPA – Environmental Protection Agency

ETJ – extra territorial jurisdiction

FAA – Federal Aviation Administration

FEMA – Federal Emergency Management Agency

FIRM – Flood Insurance Rate Map

FML – flexible membrane liner

FMLER – flexible membrane liner evaluation report

ft-msl – feet above mean sea level

FTB – film tear bond

FWS – U.S. Fish and Wildlife Service

LIST OF ACRONYMS (Continued)

GLER – geomembrane liner evaluation report

GWSAP – groundwater sampling and analysis plan

HDPE – high density polyethylene

LCS – leachate collection system

LEL – lower explosive limit

LFG – landfill gas

LLDPE – linear low density polyethylene

LQCP – Liner Quality Control Plan

MCLs – maximum contaminant levels

msl – mean sea level

MSW – municipal solid waste

NAAQS – National Ambient Air Quality Standards

NCRS – Natural Resources Conservation Service

NCTCOG – North Central Texas Council of Governments

NFIP – National Flood Insurance Program

NOI – Notice of Intent

NSF – National Sanitation Foundation

NSPS – New Source Performance Standards

NWP – Nationwide Permit

NWS – National Weather Service

O&M – operations and maintenance

LIST OF ACRONYMS (Continued)

PCBs – polychlorinated biphenyls

PI – point of intersection

PVI – Point of Vertical Intersection

POR – Professional of Record

POTW – publicly owned treatment works

QA/QC – quality assurance/quality control

RCRA – Resource Conservation Recovery Act

SBP – soil boring plan

SCS – Soil Conservation Service

SDP – site development plan

SLER – soils and liner evaluation report

SOP – site operating plan

SSC – statistically significant change

TAC – Texas Administrative Code

TCEQ – Texas Commission on Environmental Quality

TDH – Texas Department of Health

THC – Texas Historical Commission

TPDES – Texas Pollutant Discharge Elimination System

TPWD – Texas Parks and Wildlife Department

TWC - Texas Water Commission

TWDB – Texas Water Development Board

TxDOT – Texas Department of Transportation

LIST OF ACRONYMS (Continued)

UEL – upper explosive limit

USACE – United States Army Corps of Engineers

USCS – Unified Soil Classification System

USGS – United States Geological Survey

USLE – universal soil loss equation

UTM – Universal Transverse Mercator System

WCG – Weaver Consultants Group

1 INTRODUCTION (§330.63(a))

This Site Development Plan (SDP) for the Turkey Creek Landfill has been prepared consistent with the MSW regulations within Title 30 TAC Chapter 330, including §330.63. This SDP provides the design details needed to provide for the safeguarding of the health, welfare, and physical property of the people and the environment through consideration of geology, soil conditions, drainage, land use, zoning, and adequacy of access roads and highways. Any modifications will be submitted to the executive director in accordance with Title 30 TAC §305.45(2)(8)(A).

This section addresses §330.63. Additional specific regulatory cites addressed by each section of Part III are listed in the heading.

2 GENERAL FACILITY DESIGN (§330.63(b))

2.1 Facility Access (§330.63(b)(1))

2.1.1 Site Access

The Turkey Creek Landfill is located approximately 2.5 miles south of the City of Alvarado in Johnson County. The site entrance is located off the southbound Interstate Highway 35 West (IH-35W) Frontage Road immediately north of County Road 107. The site is accessed mainly via IH-35W. Additionally, the site is accessed via County Road (CR) 313, CR 107, CR 204, CR 401, and Farm to Market (FM) Road 2415. IH-35W is a four-lane, divided, controlled access expressway constructed to federal interstate highway standards. CR 313, CR 107, CR 204, and CR 401 are two-land, asphalt-paved county roads. FM 2415 is also a two-lane, asphalt-paved road. Access is controlled by a gate that is locked when the site is not in operation.

2.1.2 Access Control

Vehicle access to the landfill will be controlled at the site entrance by signs that direct all landfill traffic to the scalehouse during site operating hours. Personnel on duty at the entrance regulate access to the landfill. Outside operating hours, the gate to the site will be locked to prevent unauthorized vehicle access. As shown on Parts I/II, Drawing I/II-A.11 – Access Control Plan, an existing minimum 4-foot-high, 3-strand barbed wire fence is located along the permit boundary limits to prevent unauthorized access to the site, with the exception of the northeastern portion of the permit boundary.

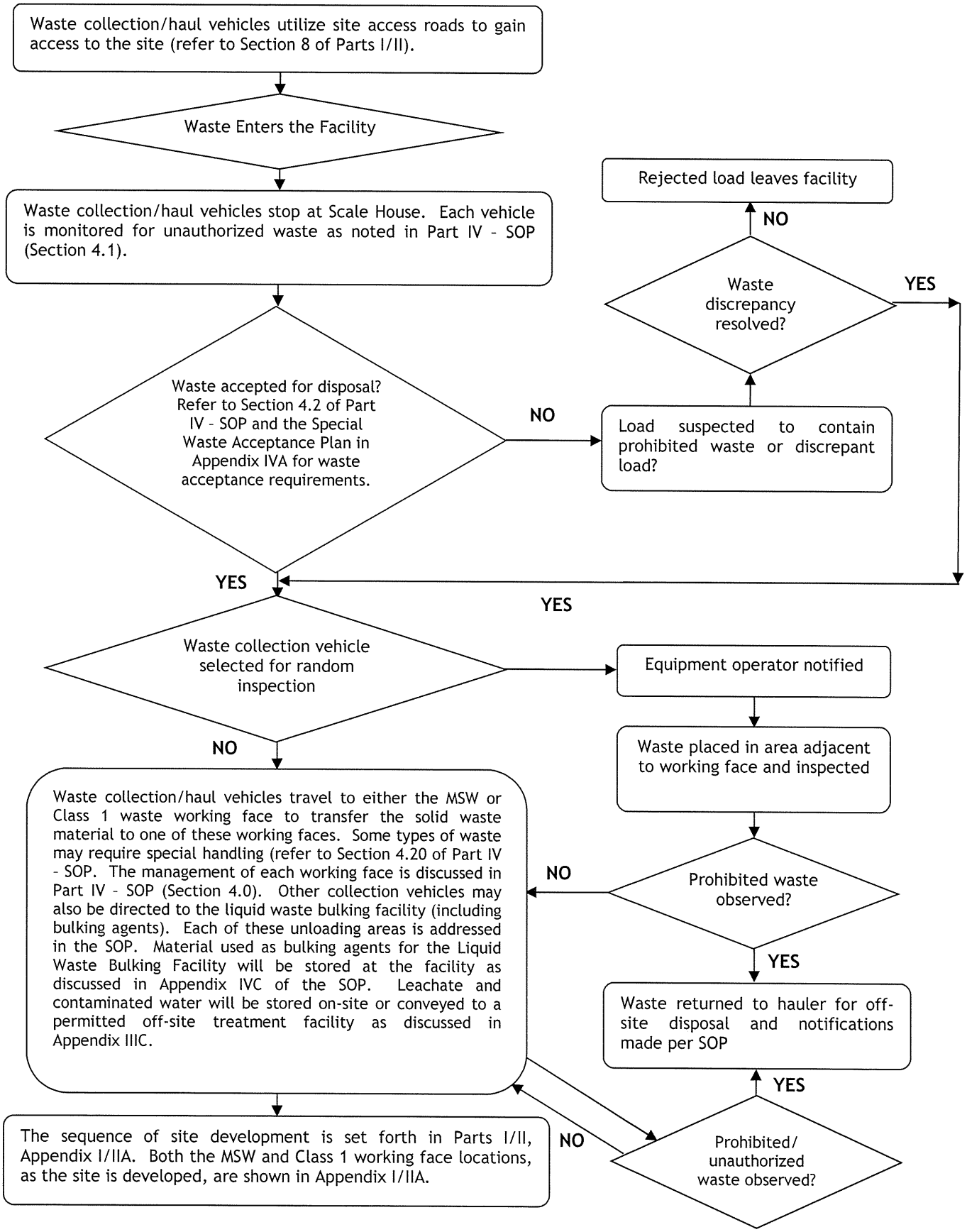
Texas Regional Landfill Company, LP will restrict entry to the landfill to designated site operations personnel, solid waste haulers authorized to use the facility, TCEQ personnel, and properly identified persons whose entry is authorized by the Landfill Manager or his designee. Texas Regional Landfill Company, LP reserves the right to deny access to the landfill to persons not demonstrating a legitimate purpose for visiting. Visitors are allowed on the active area of the landfill only when accompanied by the Landfill Manager or his designee (refer to Part IV – SOP, Section 4.1 for additional information).

2.2 Waste Movement (§330.63(b)(2))

2.2.1 Waste Movement Flow Diagram (§330.63(b)(2)(A))

Figure III-1 (shown on the following page) provides a waste movement flow diagram for the Turkey Creek Landfill. The flow diagram provides a summary of the disposal sequence for waste that is accepted at the facility. Detailed waste acceptance procedures are detailed in Part IV – SOP.

Figure III-1
Waste Movement Flow Diagram



2.2.2 Waste Disposal Schematic View (§330.63(b)(2)(B))

Figure III-2 provides a schematic view of the Turkey Creek Landfill operations. Additional detailed drawings of the various phases of site sequencing and development are provided in Parts I/II, Appendix I/IIA; Part III, Appendix IIIA; and throughout the SDP.

2.2.3 Ventilation and Odor Control (§330.63(b)(2)(C))

Landfill disposal operations will occur in open areas within the permitted waste disposal footprint; therefore, adequate ventilation will be provided. The site will comply with all the applicable air quality rules and regulations. The site will be required to operate in accordance with the New Source Performance Standards (NSPS) for MSW landfills.

Steps will be taken to limit the impact of the facility's operation on air quality. Among the measures set forth in Part IV – SOP to be employed are the following:

- Accidental fires will be controlled.
- Open burning of waste will not be permitted.
- Incoming waste will be promptly compacted into the working face area.
- Ponded water at the site will be controlled.

Odors shall be controlled at the site and will be reduced if they occur in accordance with this Odor Management Plan. A detailed Odor Management Plan is included in Part IV – SOP (Section 4.10). Sources of landfill odor can vary considerably and may include the wastes being delivered to the landfill, the open working face, surface emissions from the covered portion of the landfill, or the leachate collection system. Many of the wastes received at a landfill are a source of odor upon receipt, such as sludge and dead animals. Other wastes have the potential for becoming a source of odor by their biodegradable characteristics, generating gases as they advance through the decomposition process. Leachate may also be a source of odor if not properly handled or disposed of in a timely manner. Among the measures listed in Part IV – SOP that may be employed to reduce potential odors are the following.

- Minimize the size of the working face area.
- Increase the thickness of soil daily cover and/or ADC applied to the working face.
- Prevent ponded water.
- Assess the effectiveness of the LFG extraction system, if applicable, and make all necessary repairs to the system or expand the system, as needed, to control odors.

- Identify any waste stream that requires special attention to control odor. If the Scale Operator notes a load with significant odors, they will notify the working face personnel. The load will be promptly covered with soil or solid waste when it arrives at the working face.
- Inspect the leachate collection and storage system to confirm that it is functioning as designed (e.g., inspect piping and storage tank system to verify no leaks have occurred).

2.2.4 Generalized Construction Details (§330.63(b)(2)(D))

Generalized construction details for the landfill and liquid waste bulking facility are included in Parts I/II, Appendix I/IIA and in this SDP (e.g., Appendix IIIA). Design and operation requirements for the liquid waste solidification facility are included in Part IV – SOP. Also, details of the leachate management system are included in Appendix IIIC.

2.3 Water Pollution Control (§330.63(b)(4))

The site is designed to prevent discharge of pollutants into waters of the state or waters of the United States, as defined by the Texas Water Code and the Federal Clean Water Act, respectively. The Turkey Creek Landfill is subject to TCEQ's storm water permit requirements. A copy of the TPDES permit is included in Appendix I/IIE. Surface water monitoring will be conducted consistent with TPDES requirements.

Consistent with Title 30 TAC §330.63(b)(4), Part IV, Appendix IVE describes how liquids resulting from the operation of the liquid waste bulking facility will be managed so as not to cause surface or groundwater pollution.

2.4 Protection of Endangered Species (§330.63(b)(5))

Information regarding the protection of endangered species in accordance with Title 30 TAC §330.61(n) and §330.63(b)(5) is provided in Parts I/II, Section 12 – Protection of Endangered Species; and Part IV, Section 4.14. No endangered or threatened species have been documented at the site nor has a critical habitat for such species been identified at the site. Neither the facility nor its operation will result in the destruction or adverse modification of the critical habitat of endangered or threatened species. If endangered or threatened species are encountered during site operations, Texas Parks and Wildlife and U.S. Fish and Wildlife will be notified. A site specific Threatened and Endangered Species Habitat Assessment is included in Parts I/II, Appendix I/IIB (refer to the TPWD and FWS tabs).

LEGEND

- LANDFILL PERMIT BOUNDARY
- PROPOSED LIMITS OF WASTE
- PERMITTED LIMITS OF WASTE
- 700 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- EASEMENT
- PROPOSED RELOCATED EASEMENT
- MW-16 EXISTING GROUNDWATER MONITORING WELL
- GMP-3 EXISTING LFG MONITORING PROBE
- MW-16 PROPOSED GROUNDWATER MONITORING WELL
- GMP-3 PROPOSED LFG MONITORING PROBE

N

0 200 400
SCALE IN FEET

GMP-2A
MW-37
MW-19
MW-20
MW-21
MW-28
MW-29
GMP-13A
BP PIPELINE EASEMENT (GAS)
MW-3B
MW-26
MW-30
IH35
GMP-12
LEACHATE STORAGE TANK
MW-31
CONVENIENCE CENTER
MAINTENANCE BUILDING LOCATION
LANDFILL OFFICE
SCALEHOUSE
MW-27
GMP-11
BP PIPELINE EASEMENT (GAS)
BP PIPELINE EASEMENT (GAS)
SITE ENTRANCE
SITE EXIT
GMP-10B
MW-38
CR107
SITE BOUNDARY/PROPERTY LINE
MW-36
GMP-1A
MW-35
GMP-3A
M.K.J. RAILROAD
MW-34
GMP-4A
GMP-14
GMP-5B
GMP-15
MW-17
GMP-6
CR313
PROPOSED LEACHATE STORAGE TANK
GMP-16
MW-42
GMP-7B
POWERLINES
MW-41
GMP-8A
GMP-9B
MW-40
MW-39
GMP-17
WASTE DISPOSAL AREA
(REFER TO PARTS I/II, APPENDIX I/IIA FOR THE SEQUENCE OF DEVELOPMENT FOR THE WASTE DISPOSAL AREA)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021.
2. APPENDIX IIIA INCLUDES INFORMATION ON THE LANDFILL UNIT DESIGN.
3. LANDFILL DISPOSAL OPERATIONS WILL OCCUR IN OPEN AREAS WITHIN THE PERMITTED WASTE DISPOSAL FOOTPRINT; THEREFORE, ADEQUATE VENTILATION WILL BE PROVIDED.
4. THE PROPOSED EASEMENT SHOWN IS FOR ILLUSTRATION PURPOSES ONLY. THE ACTUAL LOCATION WILL BE DETERMINED AT A LATER DATE IN COORDINATION WITH THE EASEMENT HOLDER.

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER
02/22/22

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DATE: 02/2022
FILE: 0771-368-11
CAD: III-2 SITE PLAN.DWG

DRAWN BY: JDW
DESIGN BY: DEP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT SITE PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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FIGURE III-2

0:\0771\368\EXPANSION 2021\PART III\III-2-SITE PLAN.dwg, jwilson, 1:2

3 FACILITY SURFACE WATER DRAINAGE REPORT (§330.63(c))

3.1 General

This facility has been designed to comply with the requirements of Title 30 TAC §330.303 and §330.63(c). Part III, Appendix IIIF contains the Surface Water Drainage Plan and permit information for the portion of the facility that is located adjacent to the floodplain (also refer to Section 3.7).

In accordance with Title 30 TAC §330.15(h), the facility has been designed to prevent discharge of pollutants into waters of the State or waters of the United States, as follows:

- No discharge of solid waste or pollutants into or adjacent to waters of the State, including wetlands, that is in violation of the requirements of the Texas Water Code, §26.121 will occur. During the active life of the facility all stormwater coming into contact with solid waste will be retained as contaminated water and treated or disposed of as outlined in Part III, Appendix IIIC - Leachate and Contaminated Water Management Plan.
- No discharge of pollutants into or adjacent to waters of the United States, including wetlands, that violates any requirement of the Clean Water Act, including, but not limited to, the TPDES requirements, pursuant to §402 as amended, and demonstrated in Part III, Appendix IIIF – Surface Water Drainage Plan, will occur. A copy of the TPDES permit is included in Parts I/II, Appendix I/IIE. Surface water monitoring will be conducted consistent with the TPDES requirements.
- No discharge of nonpoint source pollutants to waters of the United States, including wetlands, that violates any requirement of an area-wide or statewide water quality management plan that has been approved under the Federal Clean Water Act, §208 or §319, as amended will occur. The site will comply with §208 of the Federal Clean Water Act.
- No discharge of dredged or fill materials to waters of the United States, including wetlands, that is in violation of the requirements under the Federal Clean Water Act, §404, as amended, as demonstrated in Parts I/II, Appendix I/IIB (USACE coordination letter) will occur. As noted in Parts I/II, Appendix I/IIB, no development is proposed within a Section 404 Jurisdictional Area (refer to Parts I/II, Section 11.2 for additional information).

3.2 Site Drainage Patterns

The Turkey Creek Landfill permit boundary is located near the headwater of Turkey Creek. The permit boundary area drains to Turkey Creek on the northeast side of the site and to an unnamed tributary of Turkey Creek on the southeast side of the site. Turkey Creek discharges to North Fork Creek approximately 2 miles east of the landfill.

For the proposed expansion, the final cover system will include erosion control structures to effectively minimize erosion of final cover soils. The proposed drainage system also includes a perimeter channel system and detention ponds that will convey stormwater collected from the landfill area to the western portion of the site. The perimeter channels have been designed to carry the 25-year storm event to the detention ponds. The detention ponds have been designed to release the collected stormwater at a rate that is consistent with the existing permitted drainage conditions.

The site is designed to prevent discharge of pollutants into waters of the state or waters of the United States, as defined by the Texas Water Code and the Federal Clean Water Act, respectively. The Turkey Creek Landfill is subject to TCEQ's storm water permit requirements. A copy of the TPDES permit is included in Appendix I/IIE. Surface water monitoring will be conducted consistent with TPDES requirements. Given the above, the applicant understands and is in full compliance with TPDES under the Clean Water Act, Section 402 as amended.

3.3 Perimeter Drainage System

The stormwater controls for the landfill have been designed consistent with the TCEQ regulations for Type I MSW landfills. The runon/runoff stormwater controls have been designed for a 25-year storm event. These include drainage controls for the final cover, perimeter drainage channels, culverts, and detention ponds. Details for the perimeter drainage system and associated calculations are included in Part III, Appendix IIIF-B.

The drainage system is detailed in Part III, Drawing IIIF.1 – Drainage Structure Plan. Drainage from the landfill itself is directed through a system of swales, chutes, and perimeter channels to the stormwater detention ponds. The detention ponds and pond outlet structures are detailed in Part III, Appendix IIIF – Surface Water Drainage Plan.

3.4 Below Grade Stormwater Controls

Control of stormwater runon and runoff within excavation areas will be achieved using temporary stormwater control structures (e.g., diversion berms, channels, and

containment areas) as needed. The temporary stormwater control structures are used to divert uncontaminated stormwater runoff into temporary storage areas as shown in Parts I/II, Drawings I/II-A.4 through I/II-A.7 – Sector Development Plans. The uncontaminated stormwater will be used for liner construction, control of dust, and establishing vegetation. If discharge of uncontaminated stormwater is required, it will be discharged consistent with TPDES requirements.

Contaminated stormwater consists of stormwater that has come into contact with waste. Control of the contaminated stormwater will be provided through temporary diversion berms, channels, and containment areas. Temporary runon and runoff controls are shown in Parts I/II, Drawings I/II-A.4 through I/II-A.7 – Sector Development Plans and detailed in Appendix IIIC – Leachate and Contaminated Water Management Plan, Appendix IIIC-C – Containment Berm and Diversion Berm Calculations. Leachate may be recirculated on areas where a composite liner and LCS are in place. Contaminated stormwater will be diverted and contained on approved areas only. Contaminated stormwater and leachate will be managed in accordance with the guidelines set forth in Appendix IIIC – Leachate and Contaminated Water Management Plan.

3.5 Aerial Fill Stormwater Controls

Additional stormwater controls will be necessary as the site is brought above grade. Temporary diversion berms, channels, and containment areas will continue to be used for control of uncontaminated and contaminated stormwater runon and runoff. Runon and runoff temporary diversion berm sizing is provided in Part III, Appendix IIIC – Leachate and Contaminated Water Management Plan, Appendix IIIC-C – Containment Berm and Diversion Berm Calculations. Separation of the contaminated stormwater and uncontaminated stormwater runoff will be provided. Diversion berms, channels, and containment areas will be implemented for the aerial fill portions of the landfill. Sector development plans for above grade scenarios are presented in Parts I/II, Drawings I/II-A.4 through I/II-A.7 – Sector Development Plans.

The final cover will incorporate drainage swales and letdown structures or chutes for conveyance of stormwater off of the final cover. These swales and chutes have been designed to protect the final cover from erosion. As areas of the final cover are completed, vegetation will be established to provide additional erosion protection. Details of the final cover design are provided in Part III, Appendix IIIA-A – Liner, Overliner, and Final Cover System Details. Drainage details are provided in Part III, Appendix IIIF – Surface Water Drainage Plan.

Surface water runon and runoff will be managed consistent with the TCEQ regulations. Specifically, areas that have received waste but will be inactive for longer than 180 days will be provided with intermediate cover. As such, runoff from these areas will be considered uncontaminated consistent with Title 30 TAC

§330.207. Also, the site design and proper operating practices will minimize contaminated water. Routine daily cover, in combination with the other operating practices, will minimize the generation of contaminated water. Contaminated water will be managed consistent with the practices outlined in Part III, Appendix IIIC – Leachate and Contaminated Water Management Plan.

The Turkey Creek Landfill will use various interim and permanent erosion and sedimentation controls throughout the life of the site. The interim controls will be used around active areas and external embankment sideslopes and top dome surfaces. These controls will include temporary letdown structures, soil berms, and vegetation of intermediate cover areas to minimize the erosion potential from these areas. These interim controls will be used during all phases of landfill development to provide effective erosion stability for the external sideslopes and top dome surfaces. Refer to Appendix IIIF-F – Erosion Control Plan for All Phases of Landfill Operation for more information.

3.6 Erosion and Sedimentation Control

Erosion and sedimentation control is provided on site during construction activities and is incorporated into the design of the perimeter drainage system and final cover system. During construction of the various sectors, perimeter berms, perimeter drainage channels, and detention ponds, erosion and sedimentation control will be provided through the use of temporary diversion berms, drainage channels, silt fences, and hay bales. These measures will provide for control of erosion and sediment prior to stormwater flows leaving the site. An erosion and sedimentation control plan is presented in Part III, Appendix IIIF – Surface Water Drainage Plan.

Permanent erosion control features have been included in the site design. These features include design of perimeter channels for non-erodible velocities. In areas where erosion has been anticipated, erosion protection of the channels in the form of gabions, rock riprap, or turf reinforcement matting is provided. Permanent erosion protection measures are also shown in Appendix IIIF – Surface Water Drainage Plan. In addition to grass cover, permanent erosion features included in the final cover design are drainage swales and chutes shown on Parts I/II, Drawing I/IIA.8 – Landfill Completion Plan.

3.7 Floodplain Information (§330.63(c)(2))

Detailed floodplain information is included in Parts I/II, Section II and Appendix IIIF. The floodplain for Turkey Creek is located on the north and west sides of the permit boundary. A Conditional Letter of Map Revision (CLOMR) has been submitted to FEMA for review.

Excerpts from the proposed CLOMR are included in Appendix IIIF-G. No portion of the waste disposal area will be located in the 100-year floodplain. The drainage analysis provided in Appendix IIIF provides a demonstration that the proposed development will not restrict the flow of the 100-year floodplain.

3.8 Wetlands Information

The Turkey Creek Landfill property was examined for compliance with wetlands issues as described in Title 30 TAC §330.553, which states that new MSWLF units, lateral expansions, and material recovery operations from a landfill shall not be located in wetlands, unless the owner or operator makes appropriate demonstrations involving wetlands. As noted in Parts I/II – Section 11.2, the proposed expansion will not require Department of the Army authorization under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899, and a USACE permit is not required (refer to Parts I/II – Section 11.2 for additional wetlands information).

4 LANDFILL UNIT DESIGN (§330.63(d)(4))

Consistent with Title 30 Texas Administrative Code (TAC) §330.63(d)(4), this Site Development Plan was prepared to address the requirements for the landfill unit at the Turkey Creek Landfill. The following subsections discuss provisions for all-weather operations and access, the proposed landfill method, minimum and maximum design elevations, solid waste acceptance rates, site life, cross-sections and design details, and a liner quality control plan. In addition to these items as required by §330.63(d)(4), additional information regarding the geotechnical analyses, the liner design, and leachate management are also presented.

4.1 All-Weather Operation (§330.63(d)(4)(A))

The landfill perimeter roads, haul road, and interior access roads (see Parts I/II, Drawings I/II-A.4 through I/II-A.7 – Sector Development Plans) will be constructed of crushed stone, gravel, or other suitable material and will provide access from the entrance road to the fill area. From the entrance, the landfill haul road is a paved road. The paved access road and crushed stone haul road will serve as mud control for waste hauling vehicles prior to exiting the site and returning to the site access roads. The crushed stone haul road and perimeter road will be maintained for all-weather access by site personnel. Additional mud control measures will be taken if these mud control measures do not effectively minimize tracking of mud onto public roads. For example, a wheel wash may be utilized within the permit boundary.

On-site stockpiles of crushed stone, concrete rubble, masonry demolition debris, or other similar material will be provided as needed for use in maintaining passable access roads. Grading equipment or other appropriate equipment will be used, as necessary, to control or remove mud accumulations on the perimeter access road around the landfill, the landfill haul road, and the paved entrance facility area.

The landfill haul road and perimeter roads will be passable under inclement weather conditions to allow access to the working face area.

4.2 Landfill Methods (§330.63(d)(4)(B))

The proposed landfill development method for the site is a combination of area-excavation fill followed by aerial fill to the proposed landfill completion height.

The landfill drawings depicting existing site conditions, excavation, final fill height, sector fill layout, sector sections, sequence of development plans, site contour maps, and landfill completion plan are included in Parts I/II, Appendix I/IIA – Facility Layout Maps.

The excavation side slopes will be no steeper than 3 horizontal to 1 vertical (3H:1V), the aerial fill side slopes will be either 3.5H:1V or 4H:1V, and the aerial fill top slope will be 5 percent. Final cover placement will generally follow the sequence of development as shown in Parts I/II, Drawings I/II-A.4 through I/II-A.7, and will be ongoing as the site is developed. Sectors will be closed according to the closure plan provided in Part III, Appendix IIIJ – Closure Plan.

4.3 Liner and Final Cover System Design (§330.63(d)(4)(C))

4.3.1 Liner System for the Undeveloped Portion of the Solid Waste Disposal Area

The proposed composite liner system is designed to meet the requirements of Title 30 TAC §330.331(a)(1), §330.331(a)(2), and §330.331(e). The composite liner system that will be constructed within the undeveloped sectors is described below.

Table III-1
Liner System Components[1]

Subtitle D Class 1 Composite Liner System
24-inch-thick Soil Protective Cover
Drainage Geocomposite Leachate Collection System Layer
60-mil HDPE Geomembrane
3-foot-thick CCL

1. 3-foot-thick CCL is applicable to Class 1 bottom liner areas. Existing MSW liner areas include a 2-foot-thick CCL and the future overliner area will include a 2-foot-thick CCL or a GCL, as discussed in Section 4 of Appendix IIIA.

A summary of the liner system design for both the existing constructed area and the permitted unconstructed area and the liner system details are included in Part III, Appendix IIIA – Landfill Unit Design Information. Information regarding liner materials and construction quality assurance are included in Part III, Appendix IIID – Liner Quality Control Plan. The elevation of the deepest excavation is 648 ft-msl, which occurs in Sector 1A.

4.3.2 Overliner System for the Pre-Subtitle D Area

The proposed overliner system for the pre-Subtitle D area of the landfill is designed consistent with Title 30 TAC §330.331(a)(2). The proposed system is designed to convey leachate generated over the existing pre-Subtitle D area to leachate collection

sumps located in adjacent Subtitle D sectors. The overliner system is described below, with layers listed from bottom to top.

- A two-foot-thick compacted clay liner with a permeability of $1x10^{-7}$ cm/s or less;
- A textured 40-mil LLDPE geomembrane liner;
- A leachate collection drainage geocomposite layer;
- A series of leachate collection pipes; and
- A two-foot-thick protective cover layer.

The proposed overliner system design and details are also summarized in Appendix IIIA – Landfill Unit Design Information. An Overliner Compliance Demonstration, is included in Appendix IIIB. The purpose of the Overliner Compliance Demonstration is to demonstrate that the proposed waste containment system design will meet the waste containment system requirements specified in Title 30 TAC §330.331(a) by showing that the predicted concentrations of selected leachate chemical constituents do not exceed maximum contaminant levels (as listed in Table 2 in §330.331(a)(2)) in the uppermost aquifer at the Overliner Compliance Demonstration.

4.3.3 Leachate Collection System

An LCS has been designed to remove leachate from the Subtitle D areas of the landfill. The LCS layout is shown on Drawing A.1 – Excavation Plan in Appendix IIIA-A. Design of the permitted, undeveloped LCS and a demonstration of the adequacy of the existing LCS is discussed in Part III, Appendix IIIC – Leachate and Contaminated Water Management Plan. LCS details are provided in Part III, Appendix IIIA – Landfill Unit Design Information. Information regarding materials and construction quality assurance are included in Part III, Appendix IIID – Liner Quality Control Plan.

4.3.4 Final Cover System

The final cover system for the site is summarized in Table III-2. The final cover system will provide a low maintenance cover, protect against erosion, reduce rainfall percolation through the cover system, and subsequently minimize leachate generation within the landfill. As depicted on Parts I/II, Drawing I/II-A.8 – Landfill Completion Plan, a 5 percent top slope and 4H:1V (Class 1 area) sideslopes or 3.5H:1V sideslopes (MSW only area) are provided to minimize erosion and facilitate drainage of the landfill. A composite final cover will be constructed over the existing pre-Subtitle D and Subtitle D waste disposal areas. The final cover system options are described in the following table with layers listed from top to bottom.

A demonstration that the specified final cover design will provide effective long-term erosional stability is included in Part III, Appendix IIIF – Surface Water Drainage Plan (Appendix IIIF-D). The final cover system will be constructed as outlined in Part III, Appendix IIIJ – Closure Plan.

Landfill gas generated in the landfill will be collected by extraction wells, as discussed in Appendix IIII – Landfill Gas Management Plan. The landfill gas system will reduce gas pressure buildup under the final cover and control odor and gas emissions from the site. The maximum elevation of final cover is 996 ft-msl and the maximum waste elevation is 992.5 ft-msl (note that a 12-inch-thick intermediate cover layer is also included in this calculation).

Table III-2
Final Cover System Components

Composite Final Cover System[1] (MSW Only Areas)		Composite Final Cover System for Above Grade Class 1 Waste Areas		WB Final Cover System			
				Option 1		Option 2	
Top Slopes	Side Slopes	Top Slopes	Side Slopes	Top Slopes	Side Slopes	Top Slopes	Side Slopes
12-inch-thick erosion layer	12-inch-thick erosion layer	24-inch-thick erosion layer	24-inch-thick erosion layer	6-inch-thick vegetation top soil layer	6-inch-thick vegetation top soil layer	N/A	12-inch-thick vegetation top soil layer
Single-sided drainage geocomposite	Double-sided drainage geocomposite	Single-sided drainage geocomposite	Double-sided drainage geocomposite	3 ft, 10-inch-thick storage layer	3 ft, 10-inch-thick storage layer	N/A	30-inch-thick storage layer
40 mil LLDPE geomembrane (smooth)	40 mil LLDPE geomembrane (textured)	40 mil LLDPE geomembrane (smooth)	40 mil LLDPE geomembrane (textured)	Refer to Appendix IIIJ for WB Final Cover Options Design Information.			
18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s	18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s	4-foot-thick compacted clay infiltration layer with $k \leq 10^{-7}$ cm/s	4-foot-thick compacted clay infiltration layer with $k \leq 10^{-7}$ cm/s				

Note: Alternate cover options are discussed in Appendix IIIJ.

1. Applicable to non-Class 1 areas. The Subtitle D composite final cover will also be installed over the pre-Subtitle D areas that will receive overliner.

4.3.5 Groundwater Monitoring System

The purpose of the groundwater monitoring system is to verify the integrity of the containment systems discussed in the previous sections and to confirm that area groundwater is not adversely impacted by the landfill. This is accomplished by obtaining groundwater samples from the monitoring wells on the perimeter of the landfill, which are screened in the uppermost groundwater zone. Refer to Appendices IIIG and IIIH for additional information.

4.3.6 Class 1 Non-Hazardous Industrial Waste Disposal Area

As noted above, the site has been designed to accept Class 1 waste (as detailed in Parts I/II, Appendix I/IIA and Appendix IIIA-A). The area dedicated for Class 1 non-hazardous industrial solid waste will be lined with a composite liner system consisting of a 60-mil HDPE geomembrane liner overlying a 3-foot-thick compacted clay soil liner with a hydraulic conductivity of no more than $1x10^{-7}$ cm/sec in accordance with Title 30 TAC §330.331(e). As discussed in Section 6 of Appendix IIIA, this Site Development Plan includes an above grade fill option for the Class 1 disposal area.

4.4 Estimated Rate of Solid Waste Deposition (§330.63(d)(4)(D))

The Turkey Creek Landfill primary serves residences and businesses in Dallas, Denton, Ellis, Hill, Johnson, Kaufman, Parker, Tarrant, Wise, Erath, Hood, and Palo Pinto Counties. Texas Regional Landfill Company, LP estimates that the waste inflow will increase to 1,000,000 tons per year (3,497 tons per day based on a 286-day operating schedule) in 2022. After 2022, the waste inflow rate is assumed to increase consistent with the projected growth rate for the facility's general service area.

The projections are based on current market conditions and may vary as market conditions change. Using the average annual waste inflow, it is projected that this service area generates approximate 1,108,822 tons per year or 1,283,359 cubic yards (assuming an in-place density of 1,728 lb/cy) of solid waste (4,270 tons per day based on a 286-day operating schedule).

The population equivalent, as defined in Title 30 TAC §330.3, is "the hypothetical population that would generate an amount of solid waste equivalent to that actually being managed based on a generation rate of five pounds per capita per day and applied to situations involving solid waste not necessarily generated by individuals." Based on this definition, the population equivalent for the average waste stream over the active life of the site (12.9 years – refer to Appendix IIIN) was calculated as follows:

$$\frac{(1{,}108{,}822^{1}\ \text{tons/year}) \times (2{,}000\ \text{pounds/ton})}{(5\ \text{pounds/person/day}) \times (365\ \text{days/year})} = 1{,}215{,}147\ \text{persons}$$

[1] Average yearly waste inflow (based on a 286-day operating year) was calculated using the average daily waste inflow rate over the life of the site (4,270 tons/day x 286 days/year = 1,108,822 tons/year). Refer to Appendix IIIN for more information.

The major classifications of solid waste to be accepted by this facility for disposal include both residential and commercial MSW. Such waste consists of household

wastes, construction-demolition waste, and various non-hazardous industrial and special wastes as authorized by the TCEQ.

4.5 Typical Unit Cross-Sections (§§330.63(d)(4)(E) and (F))

Typical unit cross-sections are included in Appendix IIIA-B. The cross-sections are developed consistent with the requirements of Title 30 TAC §330.63(d)(4)(E) and (F).

4.6 Liner Quality Control Plan (§330.63(d)(4)(G)

Information regarding liner materials and construction quality assurance are included in Part III, Appendix IIID – Liner Quality Control Plan.

5 COMPLIANCE WITH §330.63(e) THROUGH §330.63(j)

The following table provides references to each SDP appendix that was developed to meet the specified rule.

Rule	SDP Appendix
§330.63(e)	Appendix IIIG – Geology Report and Appendix IIIM – Geotechnical Report
§330.63(f)	Appendix IIIH – Groundwater and Sampling Analysis
§330.63(g)	Appendix IIII – Landfill Gas Management Plan
§330.63(h)	Appendix IIIJ – Closure Plan
§330.63(i)	Appendix IIIK – Postclosure Care Plan
§330.63(j)	Appendix IIIL – Closure, Postclosure Care, and Corrective Action Cost Estimates

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

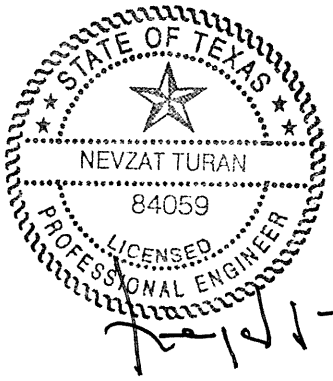
MAJOR PERMIT AMENDMENT APPLICATION

PART III – SITE DEVELOPMENT PLAN
APPENDIX IIIA
LANDFILL UNIT DESIGN INFORMATION

Prepared for

Texas Regional Landfill Company, LP

February 2022



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WCG Project No. 0771-368-11-123

This document is intended for permitting purposes only.

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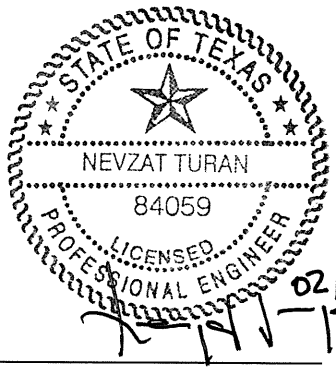

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APPENDIX IIIA-C
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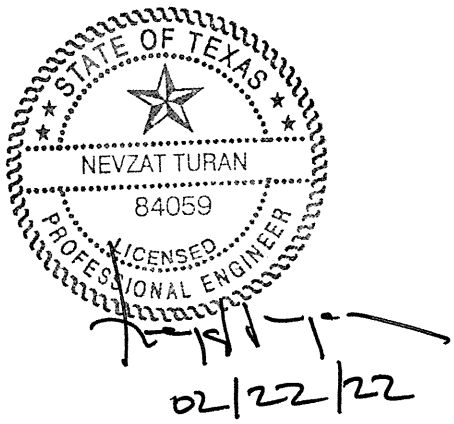

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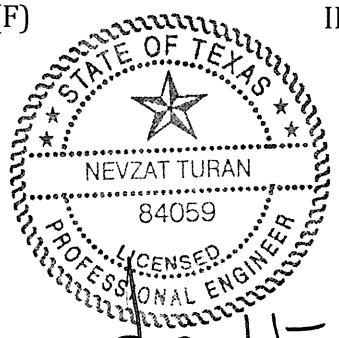

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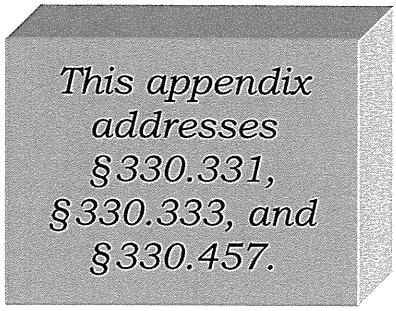
1 INTRODUCTION

The purpose of this appendix is to present the details of the liner, overliner, and final cover systems consistent with Title 30 Texas Administrative Code (TAC) §330.331, §330.333, and §330.457. The following subsections have been developed to provide detailed information for the proposed liner systems, existing liner systems, overliner system to be constructed over the pre-Subtitle D vertical expansion areas, and final cover systems.



2 PROPOSED LINER SYSTEMS FOR THE SUBTITLE D AREAS

The proposed composite liner systems are designed to meet the requirements of Title 30 TAC §330.331(a)(1), §330.331(a)(2), and §330.331(e). The composite liner system that will be constructed within the undeveloped sectors, Sectors 11, 12, 13 and 14, is described below.

Table IIIA-1
Liner System Components

Subtitle D Composite Liner System (Class 1 Areas)
24-inch-thick Soil Protective Cover
Drainage Geocomposite Leachate Collection System Layer
60-mil HDPE Geomembrane
3-foot-thick CCL (See Note 1)

1. 3-foot-thick CCL is applicable to Class 1 bottom liner areas. Existing and future MSW liner areas include a 2-foot-thick CCL and the future overliner area will include a 2-foot-thick CCL or a GCL, as discussed in Section 4.

Drawing A.1 (Appendix IIIA-A) details the excavation plan for the undeveloped areas at the Turkey Creek Landfill. Drawing A.1 also shows the areas designated for Class 1 waste disposal.

The permitted, undeveloped liner system, as shown on Drawings A.4 and A.5 in Appendix IIIA-A, is designed with a leachate collection system. The design of the leachate collection system components, including the drainage geocomposite leachate collection layer, leachate collection piping, chimney drains, sumps, and pumps, are provided in Appendix IIIC – Leachate and Contaminated Water Management Plan. Material specifications, construction, and testing requirements for the leachate collection system are provided in Appendix IIID – LQCP. The alternative liner demonstration is provided in Appendix IIIB – Overliner Point of Compliance Demonstration.

A geotechnical report including a stability demonstration for the liner system is provided in Appendix IIIM – Geotechnical Report. A summary of the liner design information that is included in the Geotechnical Report is provided below.

- **Excavation Stability.** The stability of the proposed excavation slopes was evaluated at the most critical sections (i.e., where the 3H:1V sideslopes are the longest). The excavation slopes were analyzed using undrained strength parameters (total stress) as well as drained strength parameters (effective stress). The slope stability analysis resulted in an acceptable factor of safety for each analyzed condition. All factors of safety generated were greater than the minimum recommended factor of safety of 1.3 for short-term and 1.5 for long-term conditions. Residual strength analyses achieved a minimum factor of safety of 1.0.
- **Liner System Stability.** In addition to the generalized slope stability summarized above, the interfaces of the components of the liner systems were evaluated using infinite slope stability analysis. All the calculated factor of safety values for interface slope stability are acceptable.
- **Liner System Settlement and Strain Analysis.** The liner system was evaluated for settlement and strain due to loading of liner soil, waste, and cover soils. The maximum strain on the liner system caused by the estimated differential settlement is within the acceptable range for each liner system component.

3 EXISTING LINER SYSTEMS

As of May 2019, the site has about 134.9 acres of developed waste footprint (119.1 acres of Subtitle D lined area and 15.8 acres of pre-Subtitle D area). The existing composite liner systems for the developed Subtitle D sectors are described below.

Table IIIA-2
Existing Liner System Components

Standard Subtitle D Composite Liner System (MSW Area)	Standard Subtitle D Composite Liner System (Class 1 Area)
24-inch-thick Soil Protective Cover	24-inch-thick Soil Protective Cover
Drainage Geocomposite Leachate Collection System Layer	Drainage Geocomposite Leachate Collection System Layer
60-mil HDPE Geomembrane Liner	60-mil HDPE Geomembrane Liner
2-foot-thick CCL (see Note 1)	3-foot-thick CCL (see Note 1)

1. 3-foot-thick CCL is applicable to Class 1 bottom liner areas. Existing and future MSW liner areas include a 2-foot-thick CCL and the future overliner area will include a 2-foot-thick CCL or a GCL, as discussed in Section 4.

The pre-Subtitle D area includes the area north, west, and south of Sectors 1A and 1B. Figure I/II-3.1 shows the location of the pre-Subtitle D area.

The Subtitle D area includes Sectors 1 through 11. Sectors 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 4C, 5, 6A, 6B, 7A, 7B, 7C, 8A, 8B, and 8C were constructed with a 2-foot compacted clay liner, 60-mil geomembrane, drainage geocomposite, and 2 feet of protective cover. Sectors 9A, 9B, 10A, 10B and 11A were constructed with a 3-foot compacted clay liner, 60-mil geomembrane, drainage geocomposite, and 2 feet of protective cover. The eastern portion of Sector 11 is currently undeveloped.

In addition to the above, note that the existing Subtitle D sectors that have been constructed have also been analyzed to ensure that the existing liner and leachate collection systems will continue to meet regulatory requirements as the expansion areas are developed. The impact of differential settlement on the performance of the currently constructed leachate collection systems in the Subtitle D areas is analyzed in Appendix IIIM-B and summarized in Table IIIA-3 and shows that the liner system will perform as designed.

As shown, the slope between (1) the cell ridgeline and the leachate collection pipe and (2) the slope of the leachate collection pipe from the upstream portion of the cell to the sump is reduced by a nominal amount. A demonstration that the existing

leachate collection system will continue to function in a manner that meets all regulatory requirements is included in Appendix IIIC.

Table IIIA-3
Before and After Settlement Leachate Collection Layer Slopes for the Subtitle D Sectors that are Completely Developed

Sector	Design Slope between Cell Ridgeline and Leachate Collection Pipe	Design Slope of Leachate Collection Pipe	Post-Settlement Slope between Cell Ridgeline and Leachate Collection Pipe[1]	Post-Settlement Slope of Leachate Collection Pipe[1]
Sector 2	2.0%	0.8%	2.7%	.22%
Sector 3	2.0%	0.8%	2.7%	.38%
Sector 4	2.0%	0.8%	2.7%	.47%
Sector 5	2.0%	0.8%	1.8%	.87%
Sector 6	2.0%	0.8%	1.8%	.27%
Sector 7	2.0%	0.8%	1.8%	.48%
Sector 8	2.0%	0.8%	1.8%	.53%
Sector 9	2.0%	0.8%	1.8%	.67%
Sector 10	2.0%	0.8%	1.8%	.25%

[1] As noted in Section 6.3 of Appendix IIIM – Geotechnical Report, the foundation settlement at the site is expected to be negligible. However, for leachate collection system design purposes the post-settlement slope was conservatively assumed to be at least 10 percent less than the design slope.

4 OVERLINER SYSTEM

The overliner system for the pre-Subtitle D area of the landfill is part of the waste containment system design that includes several barrier layers that work together to (1) minimize the percolation of leachate into the existing waste fill area and (2) prevent migration of leachate constituents to the point of compliance. The waste containment system design does not rely on just one containment system component, rather various components (e.g., overliner and final cover system in addition to the site location and distance to groundwater) work together to provide a high degree of environmental protection consistent with Title 30 TAC §330.331(a)(2). The proposed system is designed to convey leachate generated over the existing pre-Subtitle D area to leachate collection sumps located in the adjacent Subtitle D sectors. The proposed overliner system is described in Table IIIA-4.

The proposed top of overliner plan is shown on Drawing A.2. Overliner contours shown on Drawing A.2 indicate the possible highest elevations based on the previously approved pre-Subtitle D final cover contours. Actual elevations of the overliner may be lower than what are shown. However, the minimum overliner slopes will be consistent with the design slopes. Details for the proposed overliner system are presented on Drawings A.12 through A.14. Material specifications, construction, and testing requirements for the proposed overliner system are provided in Appendix IIID –LQCP.

The proposed waste containment system design is presented in Appendix IIIB – Overliner Point of Compliance Demonstration. The purpose of Appendix IIIB is to demonstrate that the proposed waste containment system design will meet the requirements specified in Title 30 TAC §330.331(a).

Table IIIA-4
Overliner System

Layer	Description
2-foot-thick Compacted Clay Liner or Geosynthetic Clay Liner	Lower component of the overliner system will include a 2-foot-thick compacted clay liner with a permeability of $1x10^{-7}$ cm/s or less. The compacted clay liner will be installed in accordance with Section 2 of Appendix IIID. As an alternate to the 2-foot-thick compacted clay liner, a GCL may be used in its place. The GCL will be installed in accordance with Section 4 of Appendix D.
40-mil LLDPE Textured Geomembrane Liner	The 40-mil LLDPE geomembrane textured on both sides will be installed on top of the prepared soil foundation layer. Section 3.4 of the Appendix IIID – LQCP provides detailed specifications and construction procedures for the overliner geomembrane.
Leachate Collection Layer	The leachate collection layer will consist of a geocomposite layer, double-sided for all slopes, that will be placed directly over the textured 40-mil LLDPE geomembrane to collect and convey leachate to the leachate collection system sump through pipes. The geocomposite will consist of a 300-mil-thick HDPE geonet with a 6 oz/sy non-woven geotextile heat-bonded to both sides of the HDPE geonet. Calculations specifying the required properties of the geocomposite drainage layer are presented in Appendix IIIC. The design calculations included in Appendix IIIC demonstrate that the specified drainage geocomposite will have the capacity to convey leachate to the collection pipes. The geocomposite is modeled for a variety of loading conditions. In addition, the calculations account for settlement of the waste below the overliner system and various environmental factors that will reduce the transmissivity of the geocomposite. CQA procedures for the geocomposite layer are detailed in Appendix IIID, Section 3.6.
Leachate Collection Piping	The leachate collection layer discussed above will convey collected leachate to leachate collection system trenches which will contain a perforated leachate collection pipe surrounded by drainage stone and separated from the protective cover layer by a geotextile. The leachate collection pipes will direct collected leachate to the sump that will be located along the outer perimeter of the overliner area (refer to Drawing A.2 in Appendix IIIA-A). The proposed leachate collection pipes will be SDR 17 HDPE smooth wall pipe or equivalent. The leachate collection system is designed with cleanout risers at the end of each of the collection pipes to allow the pipes to be periodically flushed to remove any collected sediment. Proposed leachate collection pipe design calculations are provided in Appendix IIIC. These calculations (1) demonstrate the adequacy of the pipes to convey leachate to the sump, (2) verify the structural stability of the pipes, and (3) verify the perforation requirements are met. The design of the chimney drain is also evaluated in Appendix IIIC.
Leachate Collection Sumps and Pumps	Temporary leachate storage will be provided in the leachate collection sump. The leachate collection sump has been sized based on the amount of leachate generated. The leachate collection sump will store a minimum of 1,809 cubic feet of leachate. Additional storage will be provided in onsite above-ground storage tanks. Sump volume calculations are provided in Appendix IIIC. Details of the leachate sumps are provided on Drawing A.11 in Appendix IIIA-A.
2-Foot-Thick Protective Cover Soil	The geosynthetics of the overliner systems will be covered with a minimum of 2 feet of protective cover (including drainage aggregate and tire chips where applicable). The protective cover will consist of soil materials that have not previously come in contact with solid waste and do not contain materials detrimental to the underlying geosynthetics. The protective cover will be free of organics, foreign objects, or other deleterious materials. The protective cover will be installed with passageways (i.e., chimney drains) to allow liquid to drain to the leachate collection system.

It should also be noted that the demonstration discussed in Section 5 of Appendix IIIB shows that the proposed overliner system will not result in any adverse effects from leachate percolation into natural soil below the bottom of the existing waste and will be in compliance with TCEQ requirements. As noted in Appendix IIIB, the selected overliner system creates an effective hydraulic barrier.

As noted in Appendix IIID, prior to the construction of the overliner system, the existing intermediate cover will be reworked and a 12-inch overliner foundation layer between existing waste and the geomembrane will be verified. The existing LFG wells may be extended, as shown on Drawing A.14, and existing LFG headers and sumps may be relocated (refer to Appendix III I for more information). The slopes of the overliner system vary between 5 percent and 25 percent and generally match existing bottom of permitted/final cover grades.

A geotechnical report, including a stability demonstration for the proposed overliner system, is provided in Appendix IIIM – Geotechnical Report and is summarized below.

- **Overliner System Stability.** The stability of the overliner system was evaluated. The interfaces of the overliner system components were evaluated to determine the factor of safety against sliding failure.
- **Overliner System Settlement and Strain Analysis.** The overliner system was evaluated for settlement and strain due to loading of liner soil, waste, and cover soils. The after-settlement grades of the overliner system are shown on Figure 3-3 in Appendix IIIC. This drawing was developed from the settlement analysis included in Appendix IIIM (Appendix IIIM-B-2). The maximum strain on the overliner system is within the acceptable range for each liner system component.

5 FINAL COVER SYSTEM

Once the site reaches the permitted waste fill grades, a composite final cover system will be installed to prevent the infiltration of stormwater into the deposited waste. Two composite final cover systems have been designed for use at the site and they are discussed in Section 5.1.

5.1 Final Cover System Options

The final cover system options that are applicable for both composite liner (Class 1 and MSW areas) and overliner areas, as well as pre-Subtitle D areas are shown in Table IIIA-5 below.

Table IIIA-5
Final Cover System Components

Composite Final Cover System[1] (MSW Only Areas)		Composite Final Cover System for Above Grade Class 1 Waste Areas		WB Final Cover System (MSW Only Areas)			
				Option 1		Option 2	
Top Slopes	Side Slopes	Top Slopes	Side Slopes	Top Slopes	Side Slopes	Top Slopes	Side Slopes
12-inch-thick erosion layer	12-inch-thick erosion layer	24-inch-thick erosion layer	24-inch-thick erosion layer	6-inch-thick vegetation top soil layer	6-inch-thick vegetation top soil layer	N/A	12-inch-thick vegetation top soil layer
Single-sided drainage geocomposite	Double-sided drainage geocomposite	Single-sided drainage geocomposite	Double-sided drainage geocomposite	3 ft, 10-inch-thick storage layer	3 ft, 10-inch-thick storage layer	N/A	30-inch-thick storage layer
40 mil LLDPE geomembrane (smooth)	40 mil LLDPE geomembrane (textured)	40 mil LLDPE geomembrane (smooth)	40 mil LLDPE geomembrane (textured)	Refer to Appendix IIIJ for WB Final Cover Options Design Information.			
18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s	18-inch-thick compacted clay infiltration layer with $k \leq 10^{-5}$ cm/s	4-foot-thick compacted clay infiltration layer with $k \leq 10^{-7}$ cm/s	4-foot-thick compacted clay infiltration layer with $k \leq 10^{-7}$ cm/s				

1. Applicable to non-Class 1 areas. The Subtitle D composite final cover will also be installed over the pre-Subtitle D areas that will receive overliner.

The landfill completion plan is shown on Drawing A.3. Details of the final cover system are presented on Drawings A.15 through A.17. Material specifications along with construction and testing procedures for the final cover system are provided in Appendix IIIE – Final Cover System Quality Control Plan (FCSQCP).

The drainage system is detailed in Appendix IIIF – Surface Water Drainage Plan. Drainage from the landfill is directed through a system of swales, chutes, and perimeter channels to the stormwater detention ponds. The detention ponds and pond outlet structures are detailed in Appendix IIIF – Surface Water Drainage Plan.

Permanent final cover erosion control structures include swales and chutes that will be constructed upon installation of the final cover. The design of the final cover system erosion control structures is provided in Appendix IIIF-B. As part of the final cover construction, an erosion layer capable of sustaining native vegetation will be constructed. Areas that receive final cover will be seeded upon completion of final cover placement. A soil loss and sheet flow velocity demonstration for the erosion layer is included in Appendix IIIF-D. The erosion layer will include a vegetation layer that provides for an 90 percent ground coverage. If there are areas that do not maintain at least 90 percent coverage they will be re-seeded until at least 90 percent coverage is maintained.

The stormwater controls for the landfill have been designed consistent with the TCEQ regulations for Type I MSW landfills. The stormwater runon/runoff controls have been designed for a 25-year frequency storm event. These include drainage controls for the final cover, perimeter drainage channels, culverts, and detention ponds, including pond outfalls. Details for the perimeter drainage system and associated calculations are included in Appendix IIIF – Surface Water Drainage Plan.

5.2 Final Cover Stability Analysis

A stability analysis for the existing and proposed final cover systems is provided in Appendix IIIM – Geotechnical Report and is summarized below.

- **Final Cover Stability.** The stability of the proposed final cover slopes was evaluated at the most critical sections. The final cover slopes were analyzed using drained and undrained strength parameters (effective and total stress, respectively). The minimum factors of safety generated were all greater than the minimum recommended factor of safety of 1.3 (total stress analysis) and 1.5 (effective stress analysis).
- **Final Cover System Stability.** The interfaces of the components of each final cover system were evaluated using infinite slope stability analysis. The minimum factor of safety calculated for the final cover system is greater than the acceptable factor of safety of 1.5 for long-term stability.

- **Final Cover System and MSW Settlement and Strain Analysis.** Each final cover system was also evaluated for settlement and strain due to consolidation of the waste material within the landfill. The maximum strain calculated is negative, which indicates that all components are in compression and not subject to strain.

6 CLASS 1 WASTE DISPOSAL AREA DESIGN

6.1 Introduction

The purpose of this section is to provide the details for the Class 1 nonhazardous industrial solid waste (Class 1 waste) disposal options for the Turkey Creek Landfill. The two above grade options (referred to as Above Grade Class 1 Fill with Perimeter Berm/Containment Dike and Operational Step Dikes and Above Grade Class 1 Fill with Perimeter Berm/Containment Dike and Soil Cover System) are discussed in Section 6.3. Drawings that show the disposal options are shown in Appendix IIIA-A. Each option discussed in the following sections are currently approved for the existing Class 1 disposal area at the site.

In addition to the design of the two Class 1 disposal area options discussed in the following sections, the landfill will comply with all applicable regulatory requirements and authorization.

6.2 Class 1 Waste Disposal Area

The Class 1 non-hazardous industrial solid waste areas will be lined with a composite liner system consisting of a 60-mil HDPE geomembrane overlying a 3-foot-thick compacted clay soil liner with a hydraulic conductivity of no more than $1x10^{-7}$ cm/s.

The Class 1 waste liner system and leachate collection system will be constructed according to Title 30 TAC §330.331(e) and §330.333 as detailed in Appendix IIIA-A and subject to the requirements of the LQCP (refer to Appendix IIID). As shown on Drawing A.1 in Appendix IIIA-A, the disposal of Class 1 waste, and other non-Class 1 wastes, will be limited to Sectors 9, 10, 11, and 12. The working face in the Class 1 waste area will have runon and runoff controls as outlined in Appendix IIIC.

6.3 Above Grade Class 1 Waste Disposal Options

6.3.1 Above Grade Disposal Options

The above-grade Class 1 waste disposal options allow for the disposal of Class 1 waste above existing grade and adjacent to containment dikes or a soil cover layer that will be constructed along the external slopes in areas that have a liner system constructed in accordance with Title 30 TAC §330.331(e).

As shown on the drawings included in Appendices IIIA-A and IIIA-B, Class 1 waste may be mixed with the other wastes accepted at the facility in areas which have a liner system constructed in accordance with Title 30 TAC §330.331(e). The above-grade Class 1 waste option includes Sectors 9 through 11 (see Drawing A.2 in Appendix IIIA-A). Class 1 waste will only be deposited up to the crest elevation of the containment dike against which the Class 1 waste is deposited.

6.3.2 Description of Above Grade Options

The above grade Class 1 waste disposal options involve the disposal of Class 1 waste above existing grade and adjacent to the operational step dikes (also referred to as containment dikes) or a 4.5-foot-thick soil layer that will be constructed along the external slopes. The above grade Class 1 disposal area options are highlighted on Drawings A.8 and A.10 in Appendix IIIA-A and Drawings B.4 through B.6 in Appendix IIIA-B and are detailed below.

- Above Grade Class 1 Fill with Perimeter Berm/Containment Dike and Operational Step Dikes. This option allows for the disposal of Class 1 wastes above existing grade if containment dikes are constructed along the exterior slope of the Class 1 waste disposal area.
- Above Grade Class 1 Fill with Perimeter Berm/Containment Dike and Soil Cover System. This option also allows Class 1 waste to be filled above the initial perimeter berm/containment dike. For this option, a 4.5-foot-thick cover soil layer will be placed on the exterior sideslopes, extending from the top of the perimeter containment dike to the maximum Class 1 fill elevation to meet the requirements listed in 30 TAC §335.590(24)(F)(i). The soil cover layer will also be placed on the topslope of Class 1 disposal areas when filled to final grade. The final cover will be constructed by incorporating the upper 3.5 feet from the soil cover layer, and constructing a final cover in compliance with 30 TAC 330.457(b) (or 30 TAC §335.590(24)(E)) and include a 4-foot thick compacted clay-rich infiltration layer. The final cover system will be constructed in accordance with all laboratory and field testing requirements set for in the Final Cover System Quality Control Plan.

As shown on Drawing A.8 (Appendix IIIA-A), Class 1 waste will only be placed after a containment dike has been constructed (containment dike option). In addition, each lift of Class 1 waste, which may be comingled with other wastes accepted at the site in accordance with Title 30 TAC §330.173(e), will be placed below the elevation of each containment dike and will slope toward the interior of the landfill. As shown on Drawing A.10, the 4.5-foot-thick soil cover layer will be placed concurrent with Class 1 waste placement, with slopes covered in 20-foot (vertical) increments.

6.4 Above Grade Class 1 Construction and Certification

6.4.1 Class 1 Containment Dike Construction and Certification Requirements

Soils used for the Class 1 containment dike will comply with the requirements for Soil Liner, as described in Section 2.3.2 and Table 2-1 of the Appendix D – Liner Quality Control Plan (LQCP). The Class 1 containment dike construction will be in accordance with Section 2.3.4 – General Fill/Structural Fill of Appendix IIID-(LQCP) and Appendix IIIA-A. Final cover construction over the Class 1 containment dikes will be in accordance with the requirements set forth in Appendix IIID-LQCP and as detailed in Appendix IIIA-A. After each Class 1 containment dike construction event, certification of the construction will be submitted to the TCEQ in compliance with 30 TAC §335.590(24)(F)(vi). The Class 1 containment dike construction record form and containment dike certification form are provided in Appendices IIIA-C-6 and IIIA-C-7, respectively.

6.4.2 Class 1 Soil Cover Layer Construction and Certification Requirements

Soils used for the Class 1 soil cover system will comply with the requirements for Soil Liner, as described in Section 2.3.2 and Table 2-1 of the Appendix D – Liner Quality Control Plan (LQCP). The Class 1 soil liner system construction will be in accordance with Section 2.3.4 – General Fill/Structural Fill of Appendix IIID-(LQCP), and Appendix IIIA-A. Final cover construction over the Class 1 soil cover system will be in accordance with the requirements set forth in Appendix IIID-LQCP and as detailed in Appendix IIIA-A. After each Class 1 soil cover system construction event, certification of the construction will be submitted to the TCEQ in compliance with 30 TAC §335.590(24)(F)(vi). The soil cover system construction record form and soil cover system certification form are provided in Appendices IIIA-C-6 and IIIA-C-7, respectively.

6.5 Class 1 Containment Dike and Soil Cover Maintenance

The installed containment dikes will be inspected in accordance with the inspection procedures and frequency included in Section 4.24 of the SOP to ensure that the installed dike surfaces are not eroded. Soil management practices outlined in Section 4.18 of the SOP (refer to Section 4.18.3) will be followed to ensure the integrity of the dike is maintained. Additionally, drainage and erosion control measures included in Appendix IIIF-F are applicable to the exterior slope of the Class 1 containment dikes. The exterior slope of the containment dikes will meet the same erosion control requirements as exterior side slopes with intermediate cover.

As noted in in Appendices IIIO and IIIP, the cohesive soils used to construct the containment dike may exhibit some volume change if subjected to conditions that would result in a significant variation in moisture.

6.5.1 Compliance with Title 30 TAC §330.179(b) and §335.590(24)(F)

Title 30 TAC §330.179(b) allows for disposal of Class 1 waste above natural grade provided that the conditions in §335.590(24)(F)(i) – (vi) are met. As shown in Table IIIA-6, the above grade Class 1 waste fill area has been designed to meet each of the requirements listed in §335.590(24)(F)(i). In accordance with §335.590(24)(F)(vii), since the requirements of §335.590(24)(F)(i) will be met, the additional requirements listed in §335.590(24)(F)(ii) through (v) are not applicable. The information provided in this appendix demonstrates that §335.590(24)(F)(i) requirements are met (see Table IIIA-6).

The stability analysis also addresses the effects of vegetation establishment on the exterior slopes of the containment dikes. This analysis is discussed in detail in Appendix IIIA-C.

Given the above, the design of the Class 1 area and the containment dikes will minimize the long-term maintenance of the area.

6.5.2 Containment Dike Preparation for Final Cover Placement

As shown on Drawing A.8 in Appendix IIIA-A, final cover will be placed on the exterior slope of the containment dike. Before soil infiltration layer construction, the vegetation on the containment dike will be removed. An equivalent amount of soil will be added to the surface of the containment dike and constructed to containment dike standards (refer to Section 3.2) to replace the amount of soil removed to clear the vegetation layer. The surface of the containment dike will then be compacted with a pad/tamping-foot or prong-foot roller to provide sufficient roughening of the exterior slope of the containment dike to ensure bonding between the containment dike and the first lift of infiltration layer material. The CQA monitor will visually inspect and approve the prepared containment dike prior to the placement of the soil infiltration layer. Approval will be based on a review of test information, if applicable, and CQA monitoring of the containment dike preparation.

6.5.3 Soil Cover Layer Preparation for Final Cover

As noted on Drawing A.10 in Appendix IIIA-A, the upper 3.5 feet of soil cover layer will be stripped and stockpiled, with the remaining 1-foot-thick soil layer remaining as intermediate cover. A final cover meeting the requirements of Title 30 TAC 330.457(b) (or Title 30 TAC 335.590(24)(E)) will then be constructed. The stripped erosion layer soil and barrier soil may be reused during construction of the final cover, provided all required laboratory and field testing and certification are completed as contained in Part III, Appendix IIIE, Final Cover System Quality Control Plan.

Table IIIA-6
Compliance with Title 30 TAC §335.590(24)(F)

Item	Compliance Discussion
§335.590(24)(F)(i)(I): Waste placed above grade shall be laterally contained by dikes that are constructed to prevent washout, release, or exposure of waste.	As shown on Drawings A.6 thru A.10 (Appendix IIIA-A), the containment dikes and operational step dikes and soil cover layer are both substantial structures, with the dikes being 13 feet high with a 14-foot-wide crest and the soil cover layers being 4.5-foot-thick. The dikes and soil cover layer will prevent the washout, release, or exposure of waste. As shown on the details on Drawings A.6 thru A.10, the containment dikes or soil cover layer will create a physical separation layer between the above-grade Class 1 disposal area and the top of the exterior sideslope. This separation layer will vary between 4 feet and 10 feet in thickness. The separation layer created by the containment dike is substantially more extensive than daily or intermediate cover that is placed on the exterior sideslopes of an MSW or non-Class 1 disposal area to serve a similar purpose. Daily and intermediate cover (addressed in Section 4.18.3 of Part IV – SOP) also creates a separation layer between the disposal area and the exterior slope to prevent the washout, release, or exposure of waste (as well as control vectors, fires, odors, and windblown litter). §330.165 requires daily and intermediate cover to be 6 inches and 12 inches thick, respectively, to create an acceptable separation layer. The containment dikes and soil cover layer specified in this Site Development Plan provide significantly more protection than daily or intermediate cover by creating a separation layer that is thicker than these layers by a factor of 4 to 10. In addition, the containment dikes provide a structural component against which the Class 1 waste is placed. This compares well to daily and intermediate cover, which is simply placed on top of waste as a cover material only. In addition, the containment dikes will be inspected and maintained on a routine basis, as noted in Section 6.5 of this appendix. Additional inspection and maintenance procedures are included in the SOP, Sections 4.18.3 and 4.24.
§335.590(24)(F)(i)(II): Waste placed above grade shall be laterally contained by dikes that are constructed to be physically stable against slope failure, with a minimum safety factor of 1.5.	As noted in Appendix IIIA-C, Appendix IIIA-C-1 through IIIA-C-3 the containment dikes and soil cover layer have been designed to be physically stable with a safety factor that is above 1.5. Separate stability for the two options were performed to demonstrate compliance with §335.590(24)(F)(i)(II). First, an analysis of the individual containment dike and secondly for the entire sideslope with containment dikes option was performed and is provided in Appendix IIIA-C-1. Second, a stability analysis for the entire sideslope was completed to determine the factor of safety for the Class 1 disposal area side slope configuration where multiple containment dikes have been constructed. An additional analysis of the side slope configuration with the Soil Cover System was performed and is presented in Appendix IIIA-C-3. The material strength parameters selected to represent the containment dikes are conservative given that the containment dikes will be constructed following the detailed construction and certification procedures listed in Section 3.2 and summarized below:

Table IIIA-6 (Continued)
Compliance with Title 30 TAC §335.590(24)(F)

Item	Compliance Discussion
§335.590(24)(F)(i)(III): Waste placed above grade shall be laterally contained by dikes that are constructed to prevent washout from hydrostatic and hydrodynamic forces from storms and floods.	Refer to Section 6.4.1 and 6.4.2 of this Appendix, Appendix IIIA-C for construction information for above-grade Class 1 areas and and for above-grade Class 1 soil cover information. Additional information is also present in Appendix P.
§335.590(24)(F)(i)(IV): Waste placed above grade shall be laterally contained by dikes that are constructed to prevent storm water from reaching the waste.	
§335.590(24)(F)(i)(V): Waste placed above grade shall be laterally contained by dikes that are constructed to minimize release of leachate.	
§335.590(24)(F)(i)(VI): Waste placed above grade shall be laterally contained by dikes that are constructed to minimize long-term maintenance.	

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

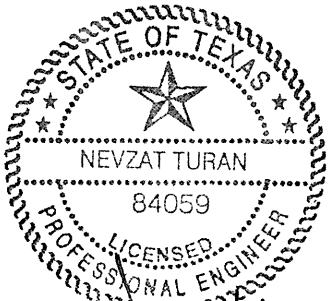
MAJOR PERMIT AMENDMENT APPLICATION

PART III – SITE DEVELOPMENT PLAN
APPENDIX IIIA-A
LINER, OVERLINER, AND FINAL COVER SYSTEM DETAILS

Prepared for

Texas Regional Landfill Company, LP

February 2022



02/22/22

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WCG Project No. 0771-368-11-123

This document is intended for permitting purposes only.

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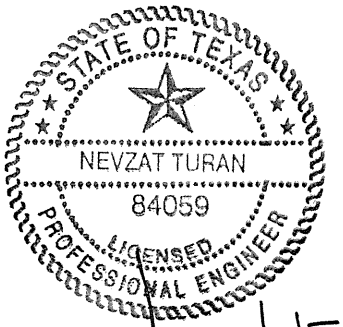

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LEGEND

- PERMIT BOUNDARY
- PROPOSED LIMITS OF WASTE
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- RELOCATED EASEMENT
- SECTOR BOUNDARY
- 800 — OVERLINER CONTOUR (SEE NOTE 9)
- 670 — PERMITTED/EXISTING TOP OF LINER CONTOUR
- 800 — PERMITTED OVERLINER CONTOUR (SEE NOTE 9)
- 662 — PERMITTED/UNDEVELOPED EXCAVATION CONTOUR
- PERMITTED/UNDEVELOPED LEACHATE LINE
- LEACHATE COLLECTION SUMP
- MW-7 — EXISTING GROUNDWATER MONITORING WELL
- GMP-12 — EXISTING GAS MONITORING PROBE
- MW-37 — PROPOSED GROUNDWATER MONITORING WELL
- GMP-17 — PROPOSED GAS MONITORING PROBE
- PRE SUBTITLE D AREA

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. EXCAVATION SLOPES AND SLOPES OUTSIDE THE LIMIT OF WASTE (e.g., CHANNELS) ARE TYPICALLY 3H:1V.
3. REFER TO APPENDIX IIIC FOR LEACHATE STORAGE INFORMATION.
4. MINIMUM EXCAVATION ELEVATION AT LCS SUMP IS 648 FT-MSL.
5. SUBTITLE D AREA LCS PIPES SLOPE WITH A MINIMUM OF 0.8% TO SUMPS. OVERLINER LCS PIPES SLOPE WITH A MINIMUM 1.0% TO SUMPS.
6. SEQUENCE OF SITE DEVELOPMENT IS PROVIDED IN PARTS I/II, APPENDIX I/IIA DRAWINGS I/IIA.5 THROUGH I/IIA.7.
7. CLASS 1 NON HAZARDOUS INDUSTRIAL WASTE (NOT CLASSIFIED AS SUCH DUE TO ASBESTOS CONTENT) WILL BE DISPOSED OF ONLY IN SECTORS 9A, 9B, 10A, 10B, 11, 11B AND 12.
8. THE OVERLINER CONTOURS SHOWN INDICATE THE POSSIBLE HIGHEST ELEVATIONS BASED ON THE PREVIOUSLY APPROVED PRE SUBTITLE D FINAL COVER CONTOURS. ACTUAL ELEVATIONS OF THE OVERLINER MAY BE LOWER THAN WHAT IS SHOWN; HOWEVER THE MINIMUM OVERLINER SLOPES WILL BE CONSTENT WITH THE DESIGN SLOPES.
9. THE OVERLINER CONTOURS SHOWN INDICATE THE POSSIBLE HIGHEST ELEVATIONS OF LLDPE COMPONENT OF OVERLINER BASED ON THE PREVIOUSLY APPROVED PRE SUBTITLE D FINAL COVER CONTOURS. ACTUAL ELEVATIONS OF THE OVERLINER MAY BE LOWER THAN WHAT IS SHOWN; HOWEVER THE MINIMUM OVERLINER SLOPES WILL BE CONSISTENT WITH THE DESIGN SLOPES.

STATE OF TEXAS
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CAD: A.1-EXCAVATION PLAN.DWG

DRAWN BY: JDW
DESIGN BY: DEP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT EXCAVATION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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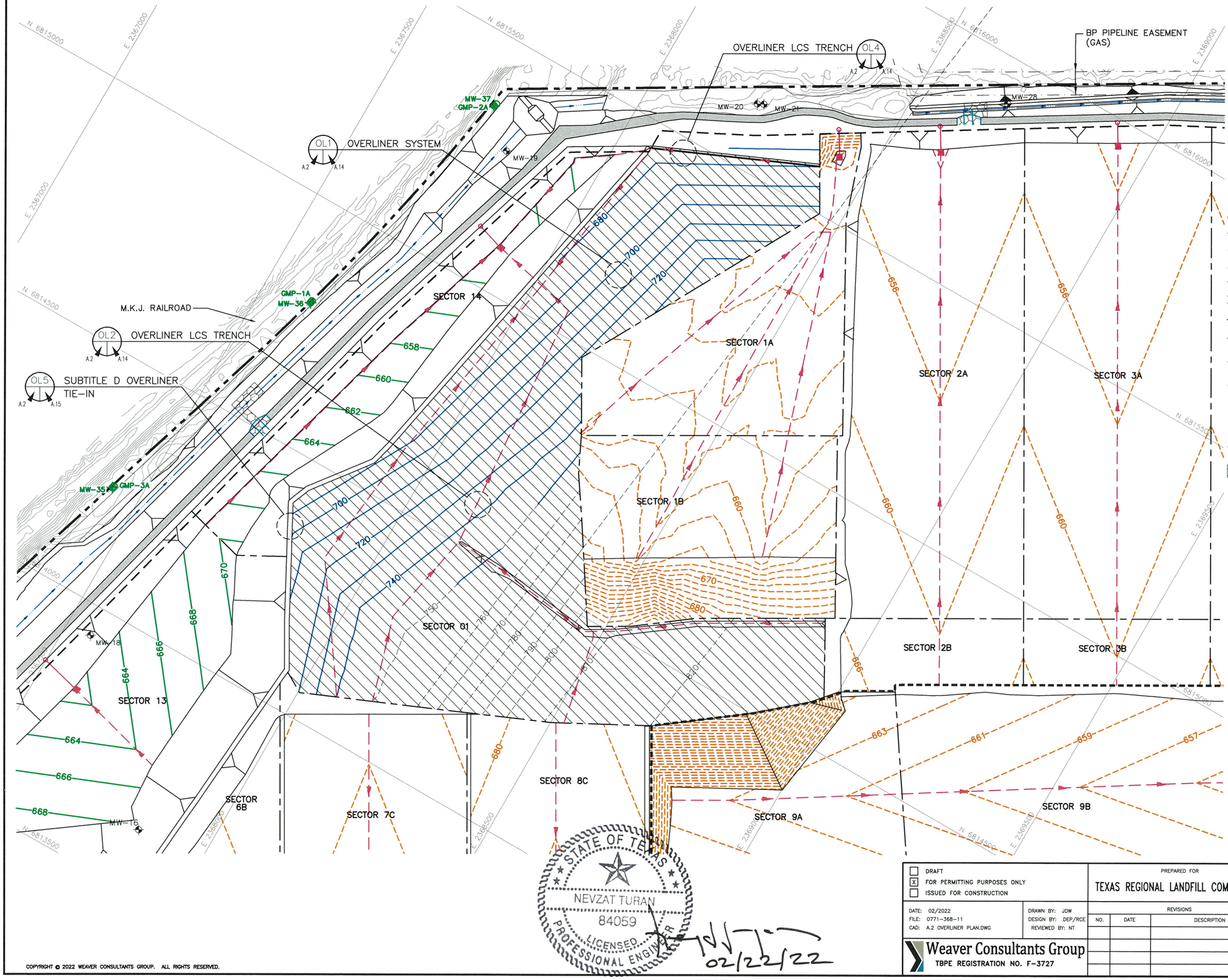
DRAWING A.1

0:\0771\368\EXPANSION 2021\PART III\IIA\A.1-EXCAVATION PLAN.dwg, jwilson, 1:2



LEGEND

- PERMIT BOUNDARY
- PROPOSED LIMITS OF WASTE
- 750 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- EASEMENT
- PERIMETER ROAD
- SECTOR BOUNDARY
- 660 PERMITTED/EXISTING TOP OF LINER CONTOUR
- 680 PERMITTED OVERLINER CONTOUR (SEE NOTE 6)
- PROPOSED LEACHATE COLLECTION PIPE
- PROPOSED LEACHATE COLLECTION SUMP
- PROPOSED LEACHATE CLEANOUT RISER
- 750 TOP OF OVERLINER CONTOUR (SEE NOTE 5)
- GABIONS
- MW-7 EXISTING GROUNDWATER MONITORING WELL
- GMP-12 EXISTING GAS MONITORING PROBE
- MW-37 PROPOSED GROUNDWATER MONITORING WELL
- GMP-1A PROPOSED GAS MONITORING PROBE
- PRE SUBTITLE D AREA

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. SEE APPENDIX IIIC FOR STORAGE TANK INFORMATION.
3. MINIMUM EXCAVATION AT LCS SUMP IS 648 FT-MSL.
4. SEQUENCE OF EXCAVATION IS PROVIDED IN PARTS I/II, APPENDIX I/IIA.
5. THE OVERLINER CONTOURS SHOWN INDICATE THE POSSIBLE HIGHEST ELEVATIONS OF LLDPE COMPONENT OF OVERLINER BASED ON THE PREVIOUSLY APPROVED PRE SUBTITLE D FINAL COVER CONTOURS. ACTUAL ELEVATIONS OF THE OVERLINER MAY BE LOWER THAN WHAT IS SHOWN; HOWEVER THE MINIMUM OVERLINER SLOPES WILL BE CONSISTENT WITH THE DESIGN SLOPES.

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CAD: A.2 OVERLINER PLAN.DWG

DRAWN BY: JDW
DESIGN BY: DEP/RCE
REVIEWED BY: NT

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TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
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MAJOR PERMIT AMENDMENT OVERLINER PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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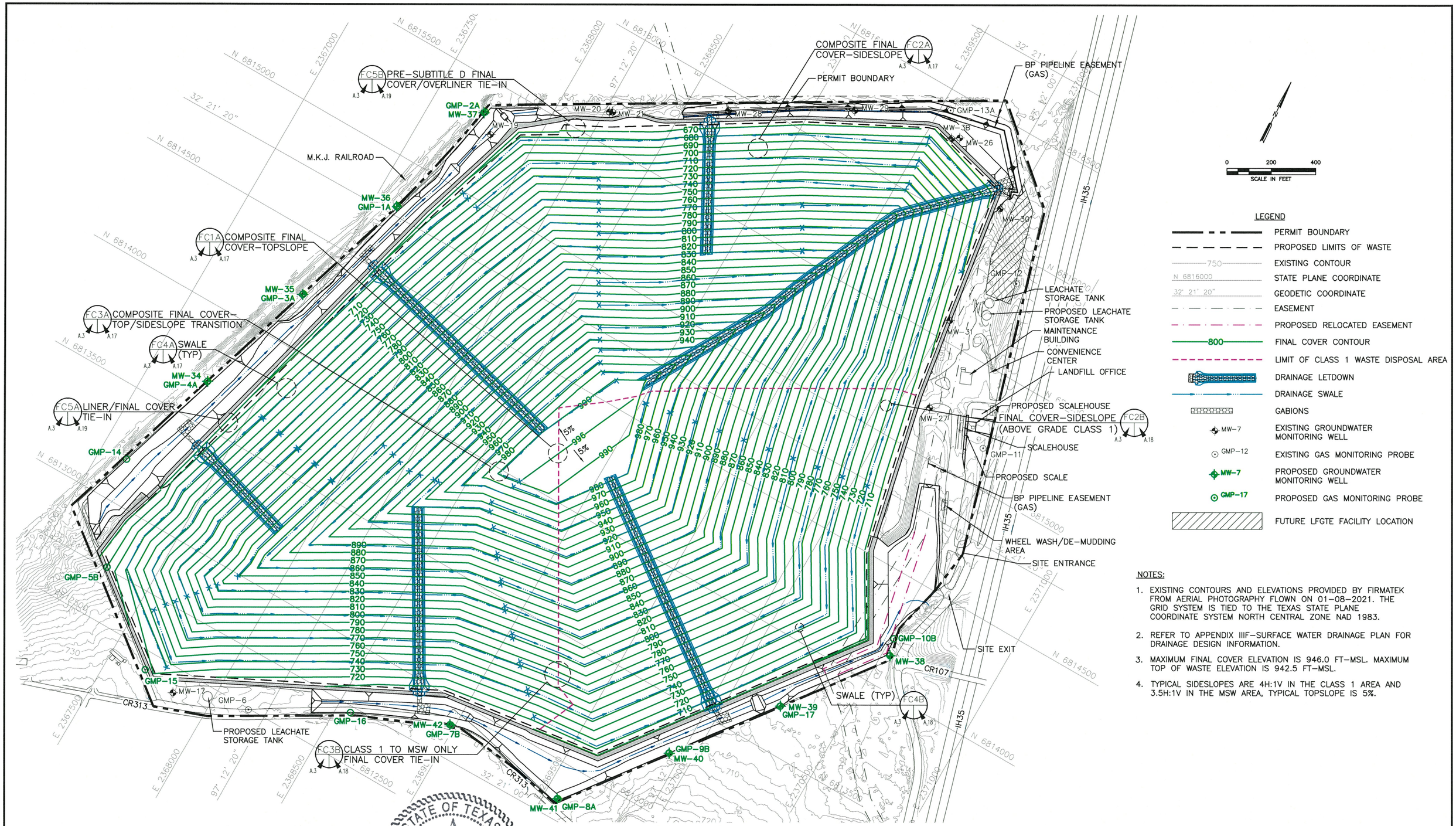
O:\0771\368\EXPANSION 2021\PART II\IIIA\A.2-OVERLINER PLAN.dwg, tarrington, 1:2



LEGEND

- PERMIT BOUNDARY
- PROPOSED LIMITS OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- PROPOSED RELOCATED EASEMENT
- 800 — FINAL COVER CONTOUR
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- GABIONS
- MW–7 — EXISTING GROUNDWATER MONITORING WELL
- GMP–12 — EXISTING GAS MONITORING PROBE
- MW–7 — PROPOSED GROUNDWATER MONITORING WELL
- GMP–17 — PROPOSED GAS MONITORING PROBE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01–08–2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. REFER TO APPENDIX IIIF–SURFACE WATER DRAINAGE PLAN FOR DRAINAGE DESIGN INFORMATION.
3. MAXIMUM FINAL COVER ELEVATION IS 946.0 FT–MSL. MAXIMUM TOP OF WASTE ELEVATION IS 942.5 FT–MSL.
4. TYPICAL SIDESLOPES ARE 4H:1V IN THE CLASS 1 AREA AND 3.5H:1V IN THE MSW AREA, TYPICAL TOPSLOPE IS 5%.

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DRAWN BY: JDW
DESIGN BY: DEP
REVIEWED BY: NT

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MAJOR PERMIT AMENDMENT LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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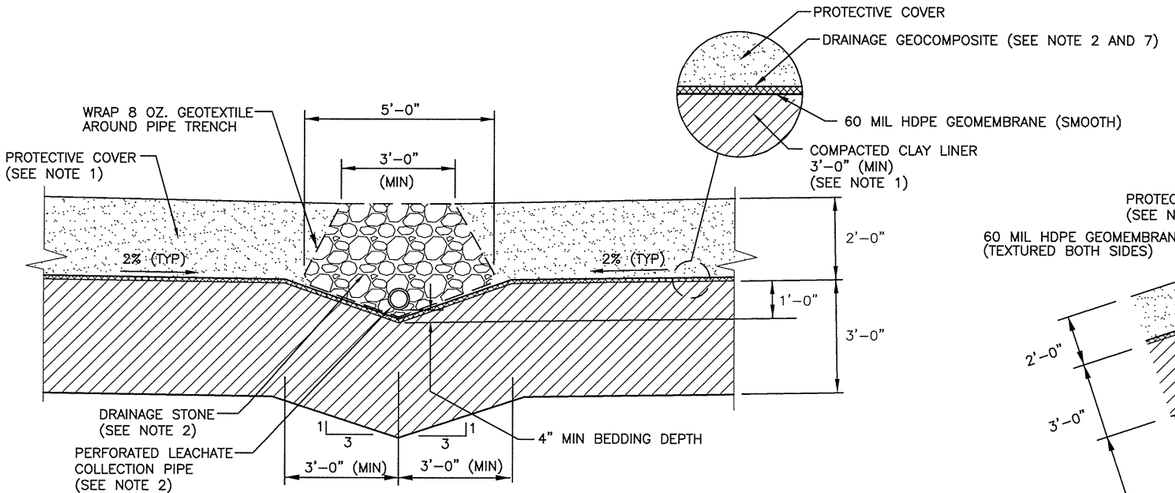
DRAWING A.3

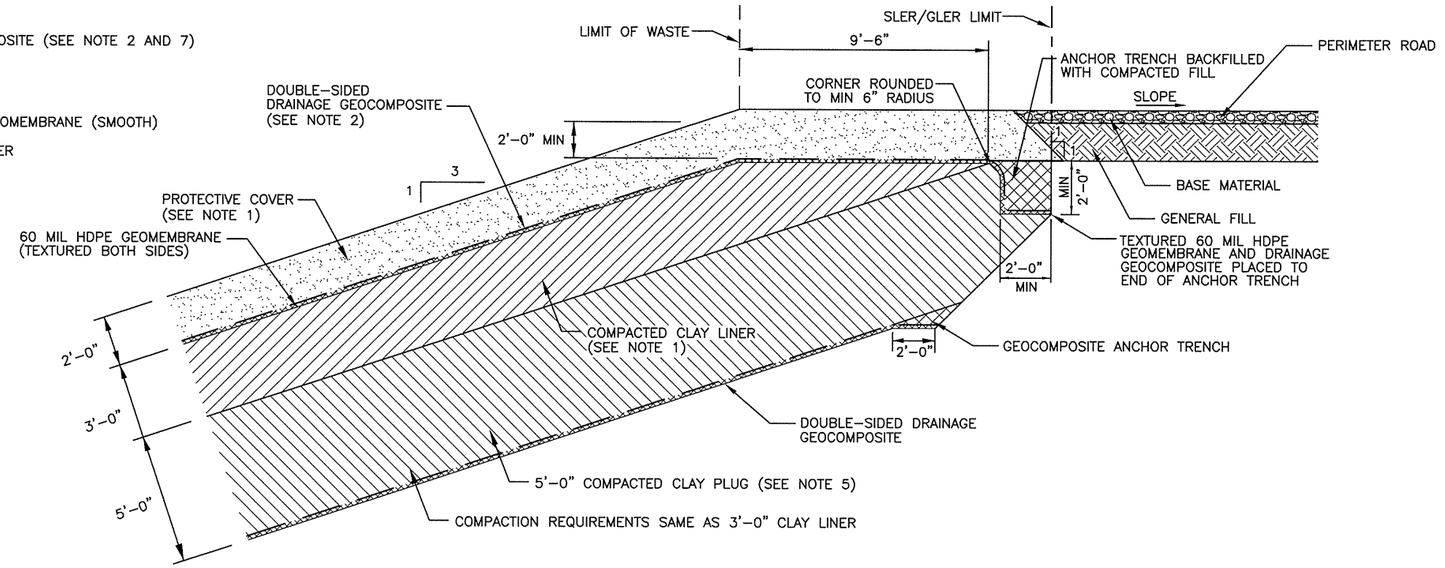
O:\0771\368\EXPANSION 2021\PART III\IIIA\A.3–COMPLETION PLAN.dwg, jwilson, 1:2



LINER SYSTEM CLASS 1 (TYP) L1 A.4 A.1,B.4,B.6

0 2 4

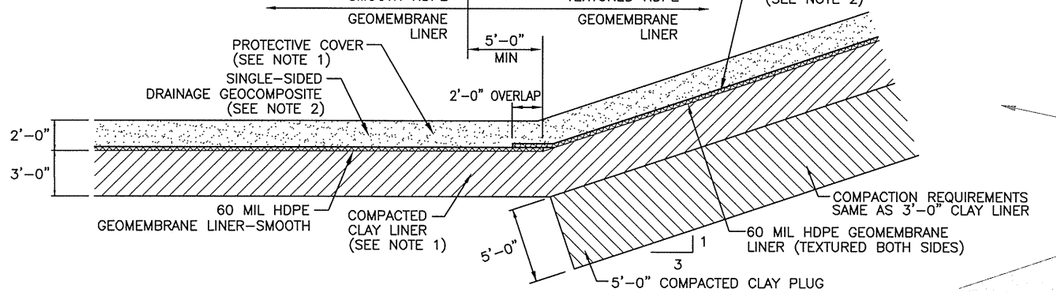
SCALE IN FEET



SIDEWALL LINER/ANCHOR TRENCH CLASS 1 L2 A.1 A.4

0 3 6

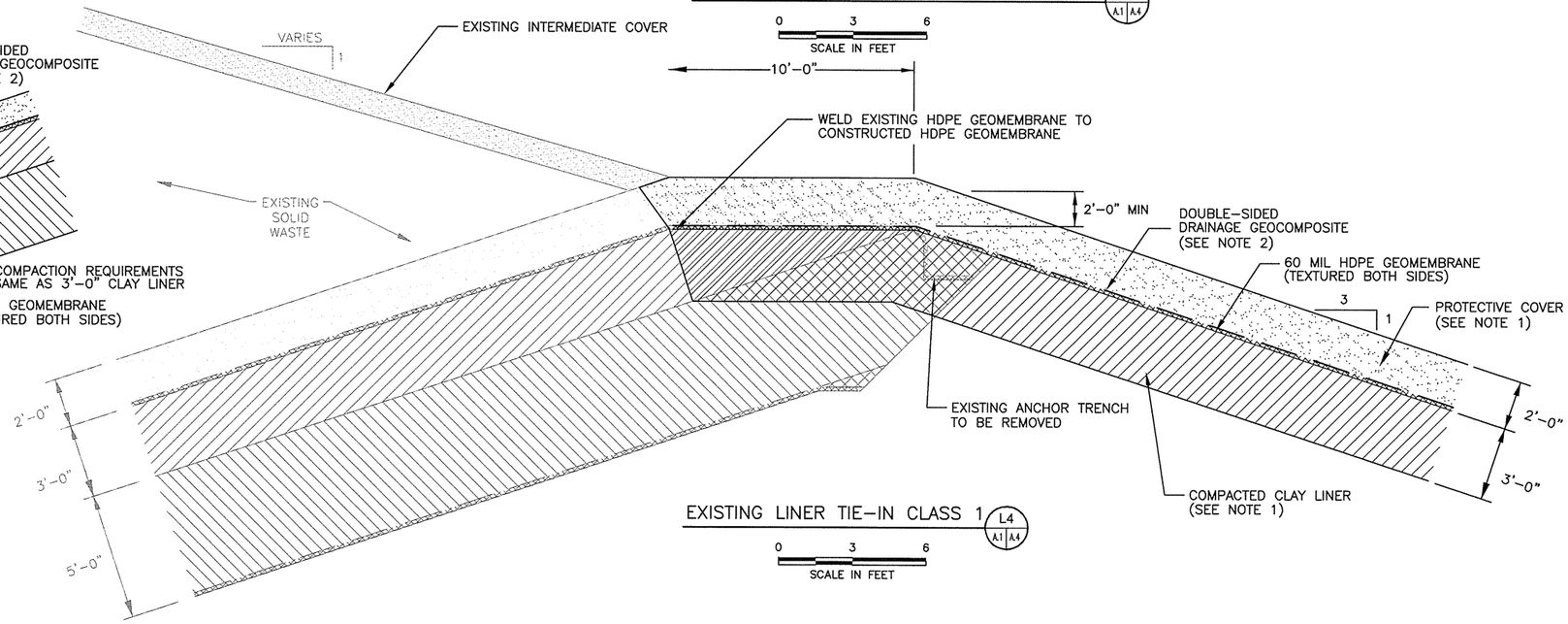
SCALE IN FEET



SIDEWALL LINER TRANSITION CLASS 1 L3 A.1 A.4

0 5 10

SCALE IN FEET



EXISTING LINER TIE–IN CLASS 1 L4 A.1 A.4

0 3 6

SCALE IN FEET

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER

02/22/22

NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF THE COMPACTED CLAY LINER, GEOMEMBRANE LINER, AND PLACEMENT OF PROTECTIVE COVER WILL BE IN ACCORDANCE WITH THE LQCP.
2. DESIGN INFORMATION FOR THE LEACHATE COLLECTION SYSTEM (LCS) COMPONENTS ARE INCLUDED IN APPENDIX IIIC–LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN. SPECIFICATIONS FOR LCS COMPONENTS ARE INCLUDED IN APPENDIX IIID–LQCP. DRAINAGE GEOCOMPOSITE FOR UNDEVELOPED LINER AREAS CONSISTS OF A 250–MIL GEONET WITH 6 OZ/SY GEOTEXTILE HEAT BONDED ON THE TOP SIDE FOR THE BOTTOM LINER AND HEAT BONDED GEOTEXTILE (6 OZ/SY) ON BOTH SIDES FOR GEOCOMPOSITE ON 3H:1V SIDESLOPES.
3. DEPENDING ON THE SLOPE, SMOOTH OR TEXTURED HDPE GEOMEMBRANE WILL BE USED, REFER TO SECTION 3 OF APPENDIX IIID–LQCP.
4. FOR SUBGRADE PREPARATION IN CLASS 1 AREAS REFER TO APPENDIX IIID, SECTION 2.3.1.1.
5. THE EXTENT OF COMPACTED CLAY PLUG IS SHOWN IN APPENDIX IIID–C, SOUTH TEMPORARY DEWATERING SYSTEM DESIGN. THE COMPACTED CLAY PLUG WAS DESIGNED FOR THE CLASS 1 LINER AREA TO MEET THE CLASS 1 DISPOSAL AREA LOCATION RESTRICTIONS AS DISCUSSED IN APPENDIX IIIG, SECTION 4.4, CLASS 1 DISPOSAL AREA LOCATION RESTRICTIONS.
6. PREVIOUSLY CONSTRUCTED MSW ONLY BOTTOM LINERS INCLUDE 2–FOOT–THICK CCL.
7. AS SHOWN IN APPENDIX IIIC–A, THE HELP MODEL WAS DEVELOPED FOR A 220–MIL GEOCOMPOSITE. 220–MIL GEOCOMPOSITE MAY BE UTILIZED AS LONG AS THE REQUIRED VALUES (EG. TRANSMISSIVITY) ARE MET. SEE TABLE 3–5 IN APPENDIX IIID FOR ADDITIONAL SPECIFICATIONS.

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DESIGN BY: DEP
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REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
LINER SYSTEM DETAILS
(CLASS 1 LINER)

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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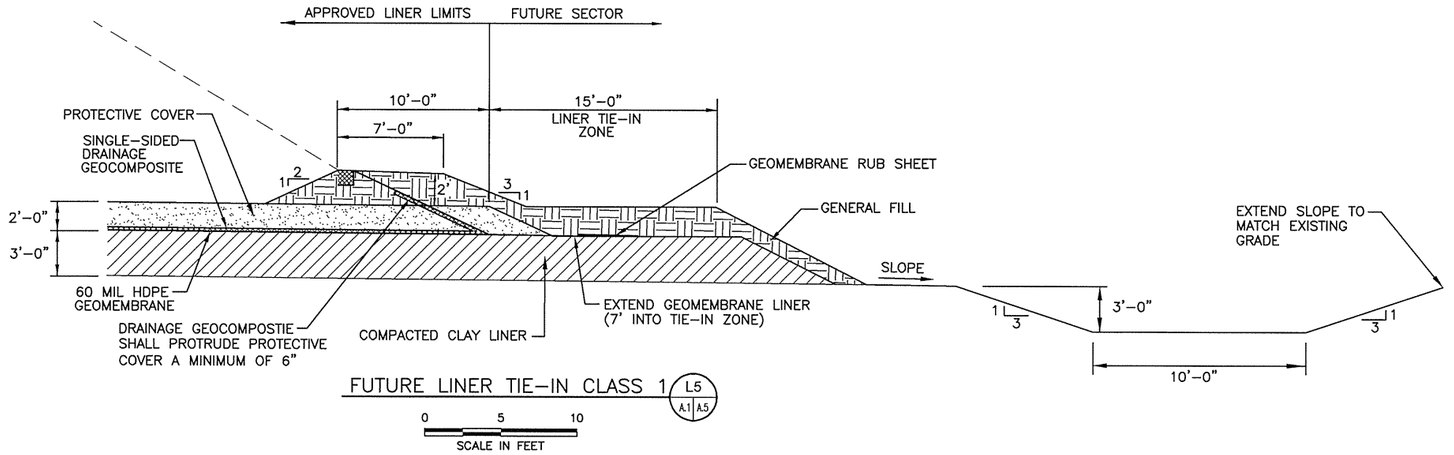
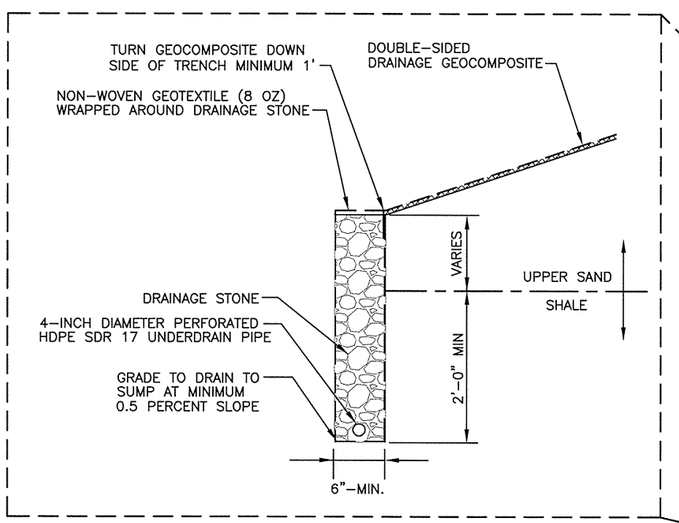
O:\0771\366\EXPANSION 2021\PART III\IIIA\A.4-LINER DETAILS.dwg, rarrington, 1:2

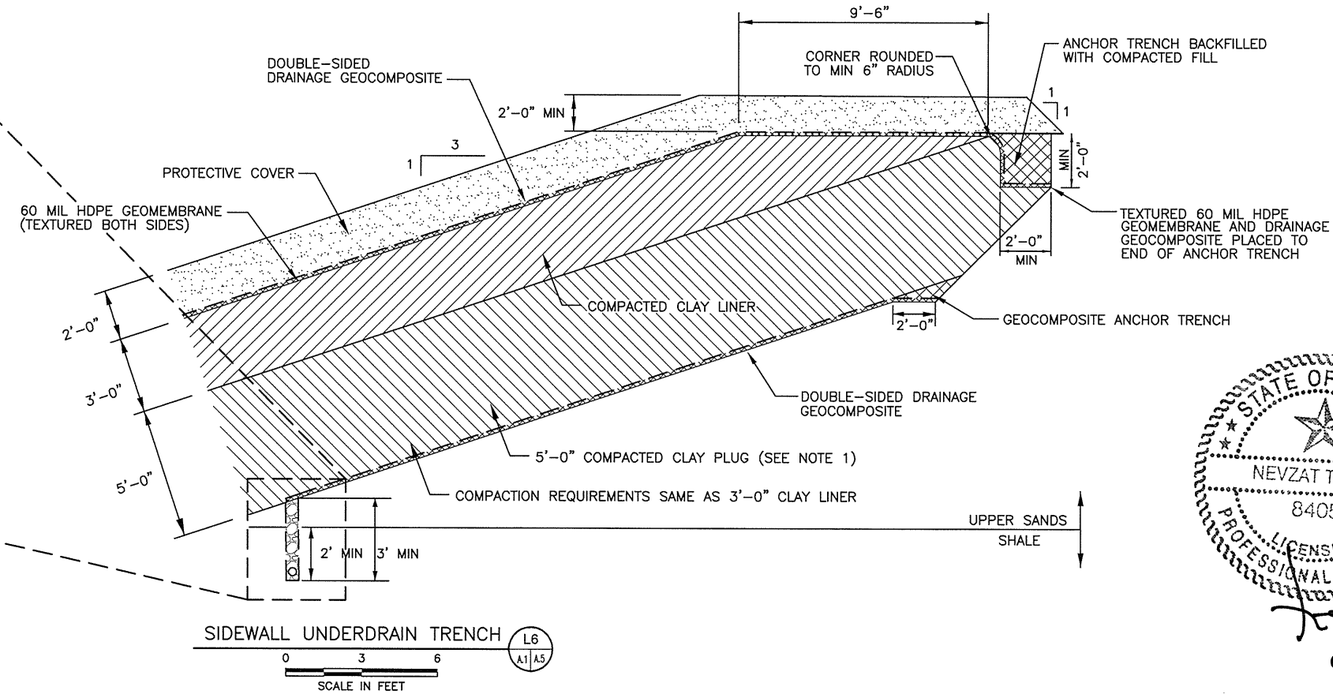


FUTURE LINER TIE–IN CLASS 1 (L5 / A1 | A5)

0 5 10

SCALE IN FEET





SIDEWALL UNDERDRAIN TRENCH (L6 / A1 | A5)

0 3 6

SCALE IN FEET

NOTES:

1. THE EXTENT OF COMPACTED CLAY PLUG IS SHOWN IN APPENDIX IIID–C, SOUTH TEMPORARY DEWATERING SYSTEM DESIGN. THE COMPACTED CLAY PLUG WAS DESIGNED FOR THE CLASS 1 LINER AREA OUTER EDGE SIDESLOPES (i.e, INTERCELL BERM(s) THAT RECIEVE CLASS 1 LINER WILL NOT INCLUDE 5'–0" CLAY PLUG; HOWEVER, UNDERDRAIN SYSTEM WILL BE INSTALLED) TO MEET THE CLASS 1 DISPOSAL AREA LOCATION RESTRICTIONS AS DISCUSSED IN APPENDIX IIIG, SECTION 4.4, CLASS 1 DISPOSAL AREA LOCATION RESTRICTIONS.

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DESIGN BY: DEP
REVIEWED BY: NT

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TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

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LINER SYSTEM DETAILS
(CLASS 1 LINER)

TURKEY CREEK LANDFILL
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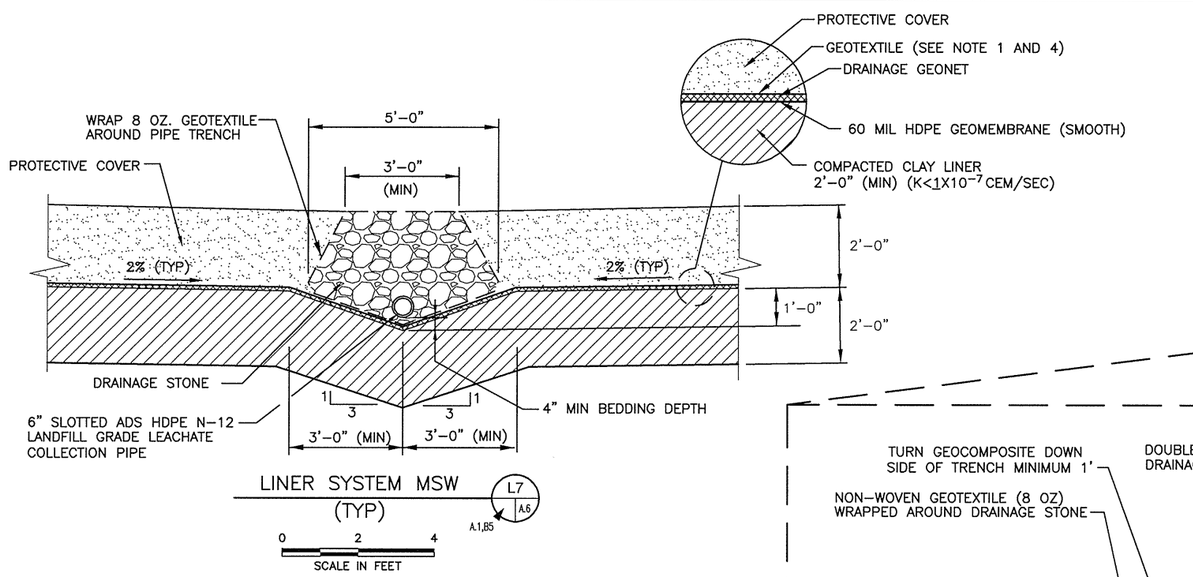
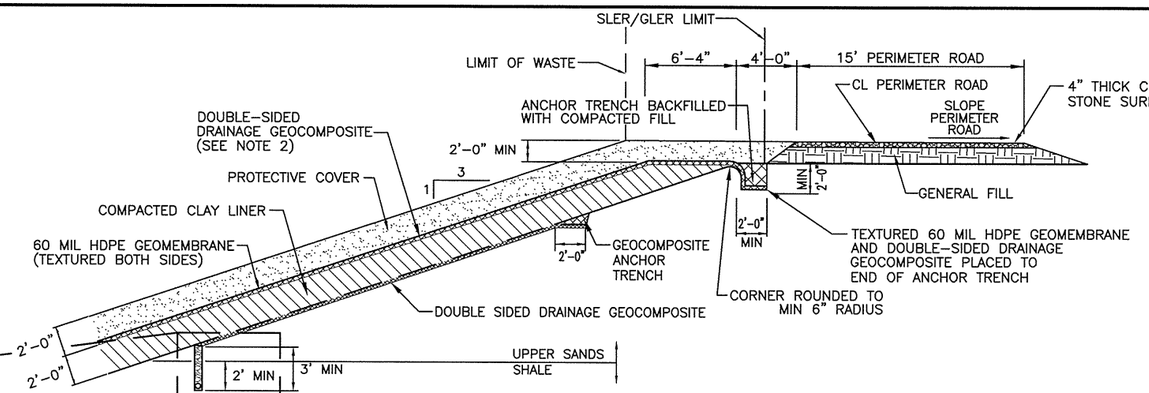
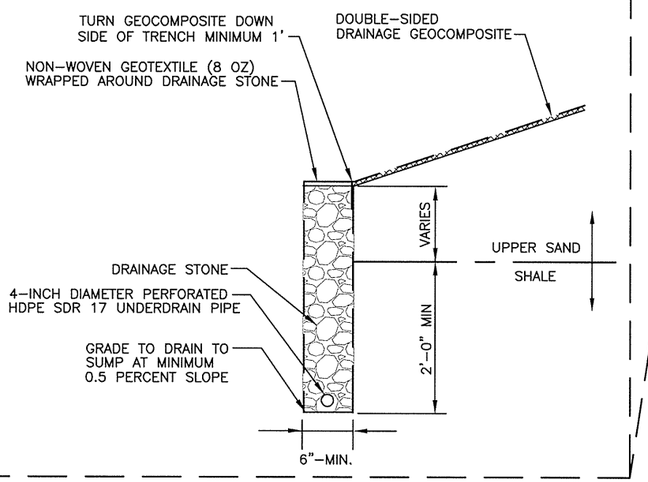


LINER SYSTEM MSW (TYP) L7 A.6 A.1,B5

0 2 4

SCALE IN FEET

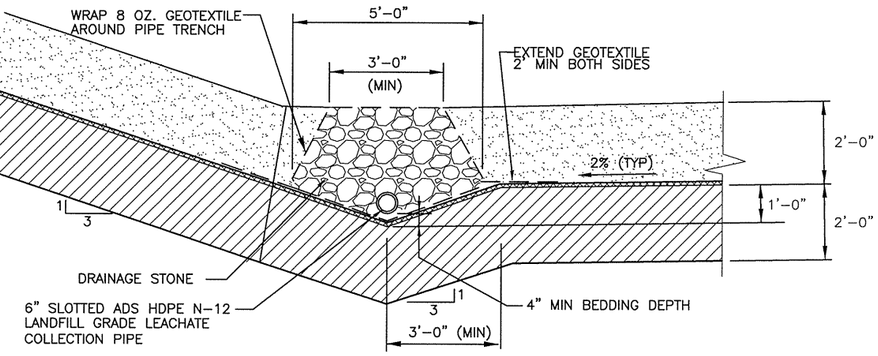




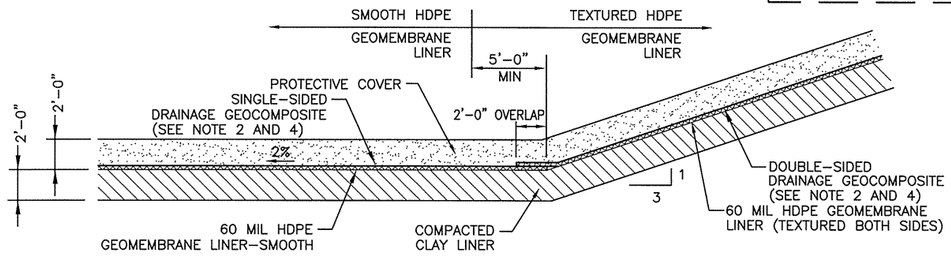
SIDEWALL LINER/ANCHOR TRENCH MSW L8 A.1 A.6

0 5 10

SCALE IN FEET



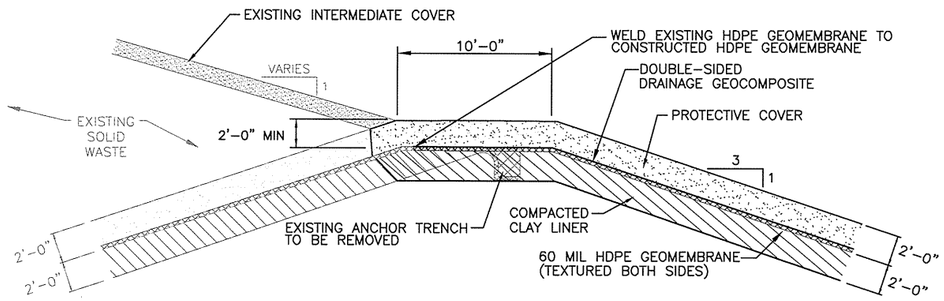
SIDEWALL LEACHATE COLLECTION TRENCH (TYP) L7A A.6 A.1



SIDEWALL LINER TRANSITION MSW L9 A.1 A.6

0 5 10

SCALE IN FEET



EXISTING LINER TIE-IN MSW L10 A.1 A.6

0 5 10

SCALE IN FEET

NOTES:

1. GEOTEXTILE MUST MEET THE FOLLOWING REQUIREMENTS:

POROSITY	> 30%
GRAB TENSILE STRENGTH	> 180 lbs
SEWN SEAM STRENGTH	> 70 lbs
PUNCTURE STRENGTH	> 80 lbs
BURST STRENGTH	> 130 psi
TRAPEZOID TEAR	> 50 lbs

2. DESIGN INFORMATION FOR THE LEACHATE COLLECTION SYSTEM (LCS) COMPONENTS ARE INCLUDED IN APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN. SPECIFICATIONS FOR LCS COMPONENTS ARE INCLUDED IN APPENDIX IIID-LQCP. DRAINAGE GEOCOMPOSITE FOR UNDEVELOPED LINER AREAS CONSISTS OF A 250-MIL GEONET WITH 6 OZ/SY GEOTEXTILE HEAT BONDED ON THE TOP SIDE FOR THE BOTTOM LINER AND HEAT BONDED GEOTEXTILE (6 OZ/SY) ON BOTH SIDES FOR GEOCOMPOSITE ON 3H:1V SIDESLOPES.
3. DEPENDING ON THE SLOPE, SMOOTH OR TEXTURED HDPE GEOMEMBRANE WILL BE USED, REFER TO SECTION 3 OF APPENDIX IIID-LQCP.
4. AS SHOWN IN APPENDIX IIIC-A, THE HELP MODEL WAS DEVELOPED FOR A 220-MIL GEOCOMPOSITE. 220-MIL GEOCOMPOSITE MAY BE UTILIZED AS LONG AS THE REQUIRED VALUES (EG. TRANSMISSIVITY) ARE MET. SEE TABLE 3-5 IN APPENDIX IIID FOR ADDITIONAL SPECIFICATIONS.

STATE OF TEXAS
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REVISIONS		
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MAJOR PERMIT AMENDMENT LINER SYSTEM DETAILS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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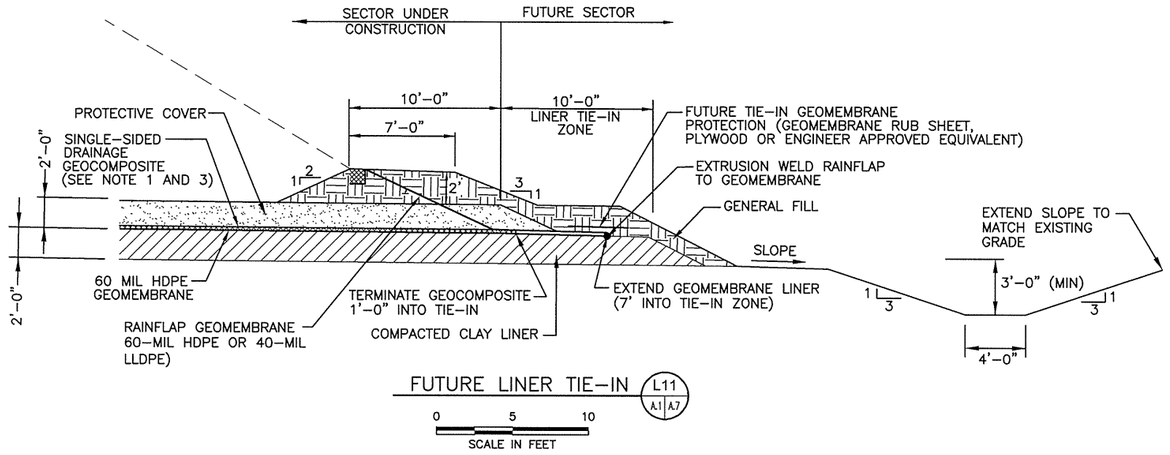
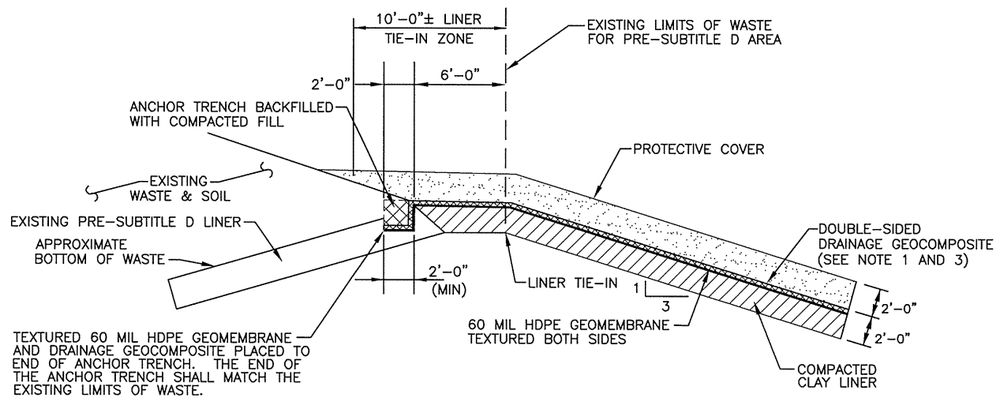


FUTURE LINER TIE–IN (L11 | A.1 | A.7)

0 5 10

SCALE IN FEET



PRE–SUBTITLE D LINER TIE–IN (SEE NOTE) (L12 | A.1 | A.7)

0 5 10

SCALE IN FEET

NOTES:

1. DESIGN INFORMATION FOR THE LEACHATE COLLECTION SYSTEM (LCS) COMPONENTS ARE INCLUDED IN APPENDIX IIIC–LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN. SPECIFICATIONS FOR LCS COMPONENTS ARE INCLUDED IN APPENDIX IIID–LQCP. DRAINAGE GEOCOMPOSITE FOR UNDEVELOPED LINER AREAS CONSISTS OF A 250–MIL GEONET WITH 6 OZ/SY GEOTEXTILE HEAT BONDED ON THE TOP SIDE FOR THE BOTTOM LINER AND HEAT BONDED GEOTEXTILE (6 OZ/SY) ON BOTH SIDES FOR GEOCOMPOSITE ON 3H:1V SIDESLOPES.
2. DEPENDING ON THE SLOPE, SMOOTH OR TEXTURED HDPE GEOMEMBRANE WILL BE USED, REFER TO SECTION 3 OF APPENDIX IIID–LQCP.
3. AS SHOWN IN APPENDIX IIIC–A, THE HELP MODEL WAS DEVELOPED FOR A 220–MIL GEOCOMPOSITE. 220–MIL GEOCOMPOSITE MAY BE UTILIZED AS LONG AS THE REQUIRED VALUES (EG. TRANSMISSIVITY) ARE MET. SEE TABLE 3–5 IN APPENDIX IIID FOR ADDITIONAL SPECIFICATIONS.

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DESIGN BY: DEP
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Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
LINER SYSTEM DETAILS
(MSW LINER)

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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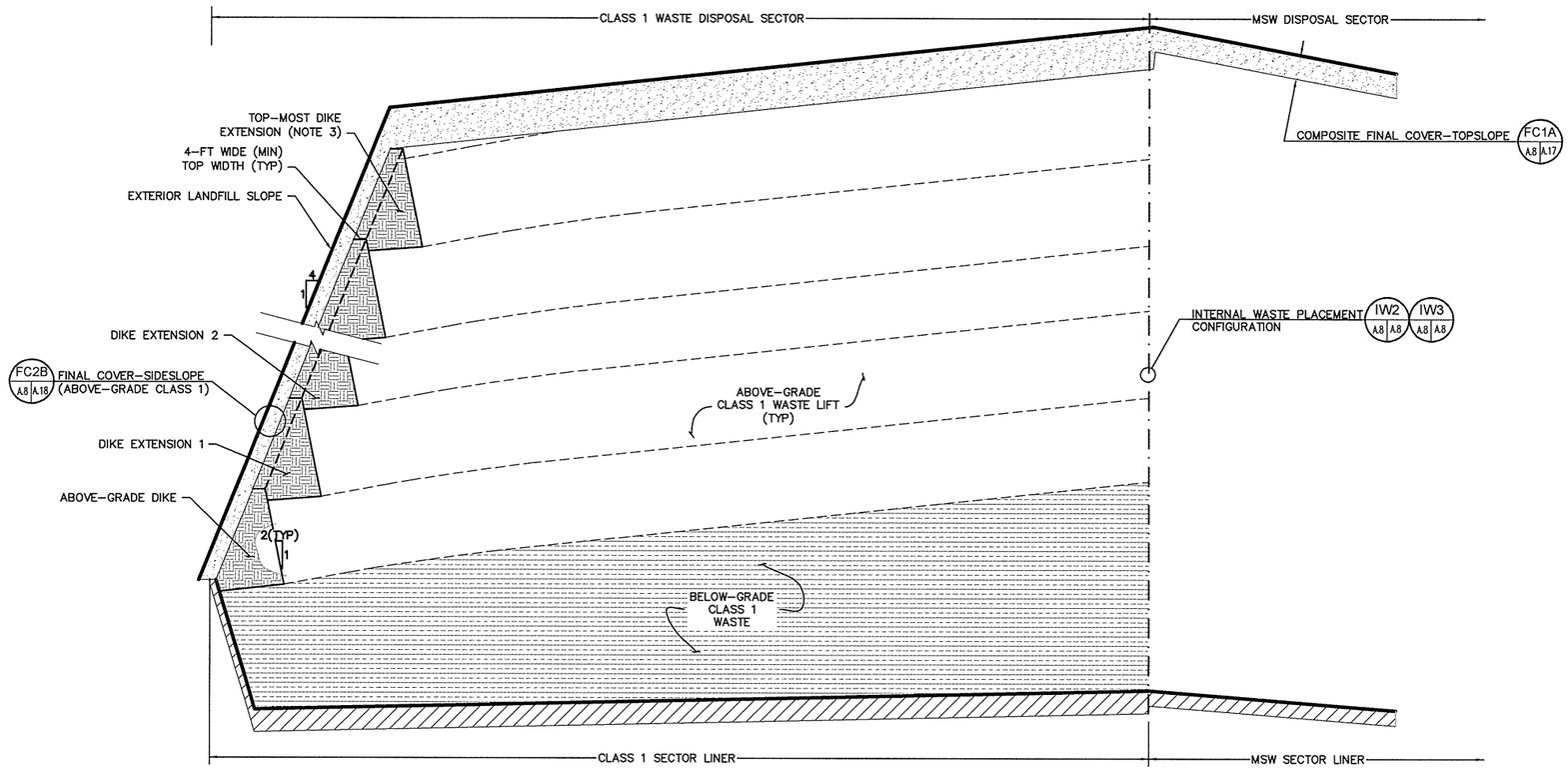
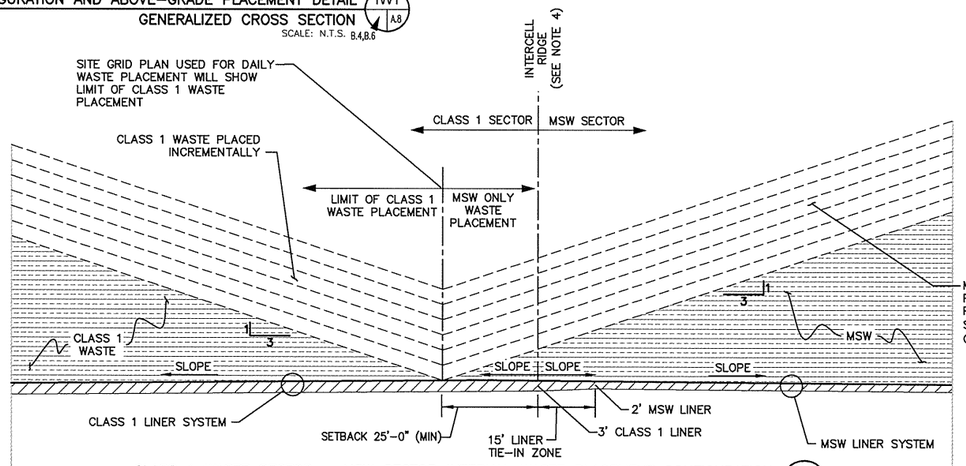


CLASS 1 WASTE CONFIGURATION AND ABOVE-GRADE PLACEMENT DETAIL IW1 A.8
GENERALIZED CROSS SECTION
SCALE: N.T.S. B.4,B.6

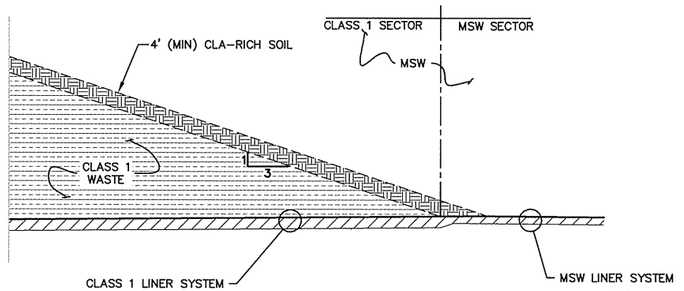


CLASS 1 WASTE SECTOR - MSW SECTOR INTERNAL WASTE PLACEMENT CONFIGURATION IW2 A.1 A.8
GENERALIZED CROSS SECTION, SETBACK OPTION

0 10 20 40
SCALE IN FEET

NOTES:

1. DETAIL IW1 ON THIS ATTACHMENT SHOWS A GENERALIZED CROSS SECTION OF A CLASS 1 WASTE DISPOSAL SECTOR, INCLUDING THE CONFIGURATION OF ABOVE-GRADE CLASS 1 WASTE PLACEMENT. ADDITIONAL REQUIREMENTS OF ABOVE-GRADE CLASS 1 WASTE PLACEMENT ARE AS FOLLOWS:
   - ABOVE-GRADE CLASS 1 WASTE PLACEMENT WILL INCORPORATE INCREMENTALLY-CONSTRUCTED EARTHEN DIKES (AND DIKE EXTENSIONS) ON EXTERIOR LANDFILL SLOPES AS CLASS 1 WASTE PLACEMENT PROGRESSES ABOVE-GRADE. MAXIMUM DIKE HEIGHT IS 12 FT. MINIMUM TOP WIDTH IS 4 FT.
   - THE OVERALL PURPOSE OF THE DIKES IS TO LATERALLY-CONTAIN THE CLASS 1 WASTE. ACCORDINGLY, THE DIKES ARE DESIGNED AND WILL BE CONSTRUCTED TO BE PHYSICALLY STABLE AGAINST SLOPE FAILURE AND AGAINST HYDROSTATIC AND HYDRODYNAMIC FORCES DURING STORM EVENTS OR FLOODS; PREVENT THE WASHOUT, RELEASE, OR EXPOSURE OF WASTE; PREVENT STORM WATER FROM REACHING THE WASTE; MINIMIZE THE RELEASE OF LEACHATE; AND MINIMIZE LONG-TERM MAINTENANCE.
   - DIKES SHALL BE CONSTRUCTED, MONITORED, AND DOCUMENTED IN ACCORDANCE WITH THE QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROCEDURES SET FORTH IN SECTION 6.3 OF APPENDIX IIIA.
   - FOR EACH LIFT OF CLASS 1 WASTE, THE WASTE PLACED AGAINST A DIKE/DIKE EXTENSION SHALL BE NO HIGHER THAN 3-FT BELOW THE CREST OF THAT DIKE.
   - UPON COMPLETION OF EACH DIKE, A THIRD-PARTY INDEPENDENT PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN TEXAS WILL CERTIFY THE INSTALLED DIKE PRIOR TO PLACEMENT OF WASTE, AS DESCRIBED IN SECTION 6.3 OF APPENDIX IIIA.
2. DETAILS IW2 AND IW3 ON THIS ATTACHMENT SHOW THREE POSSIBLE CLASS 1 WASTE CONFIGURATIONS AT THE BOUNDARY BETWEEN A CLASS 1 WASTE DISPOSAL SECTOR AND A MSW DISPOSAL SECTOR.
3. THE ABOVE-GRADE CLASS 1 WASTE FILLING SEQUENCE STARTING WHEN WASTE IS JUST BELOW GRADE, WILL BE AS FOLLOWS:
   - CONSTRUCT AND CERTIFY THE FIRST ABOVE-GRADE DIKE.
   - PLACE THE FIRST LIFT OF ABOVE-GRADE CLASS 1 WASTE ADJACENT TO THE DIKE, KEEPING THE WASTE THAT IS DIRECTLY AGAINST THE DIKE AT AN ELEVATION 3-FT BELOW THE DIKE CREST (I.E. A 3-FT SEPARATION DISTANCE).
   - WHEN THAT LIFT IS COMPLETE, CONSTRUCT AND CERTIFY THE NEXT DIKE EXTENSION. AS PART OF THE DIKE EXTENSION, THE 3-FT SEPARATION DISTANCE NEXT TO THE DIKE LEFT FROM THE PREVIOUS LIFT WILL BE FILLED WITH SOIL.
   - PLACE THE NEXT LIFT OF ABOVE-GRADE CLASS 1 WASTE.
   - REPEAT THESE STEPS AS FILLING PROGRESSES.
   - AT THE TOP MOST DIKE EXTENSION, THE 3-FT SEPARATION DISTANCE NEXT TO THE DIKE WILL BE FILLED WITH SOIL FILL, AND THEN THE FINAL COVER SYSTEM WILL BE INSTALLED.
4. THE INTERCELL RIDGE (HIGHEST POINT OF THE LEACHATE COLLECTION LAYER OR TOP OF LINER) IN BOTH SECTORS CANNOT BE LOCATED WITHIN AREA THAT IS DESIGNED TO RECEIVE CLASS 1 WASTE. CLASS 1 WASTE SHALL BE PLACED NO CLOSER THAN 25 FEET TO THE SECTOR RIDGE OR THE CLASS 1 SIDE EDGE OF TIE-IN, WHICHEVER PROVIDES LONGER SETBACK.
5. SEE DRAWING A.9 FOR AN ADDITIONAL ABOVE-GRADE CLASS 1 FILL CONFIGURATION (ABOVE GRADE CLASS 1 FILL WITH SOIL COVER LAYER).



CLASS 1 WASTE SECTOR - MSW SECTOR INTERNAL WASTE PLACEMENT CONFIGURATION IW3 A.8
GENERALIZED CROSS SECTION, SLOPED SOIL SEPARATION LAYER A.8,A.9

0 10 20 40
SCALE IN FEET

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER
02/22/22

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CAD: A.8 SEPERATION DETAILS.DWG
DRAWN BY: JDW
DESIGN BY: DEP
REVIEWED BY: NT

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TBPE REGISTRATION NO. F-3727

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TEXAS REGIONAL LANDFILL COMPANY, LP

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SEPARATION BARRIER DETAILS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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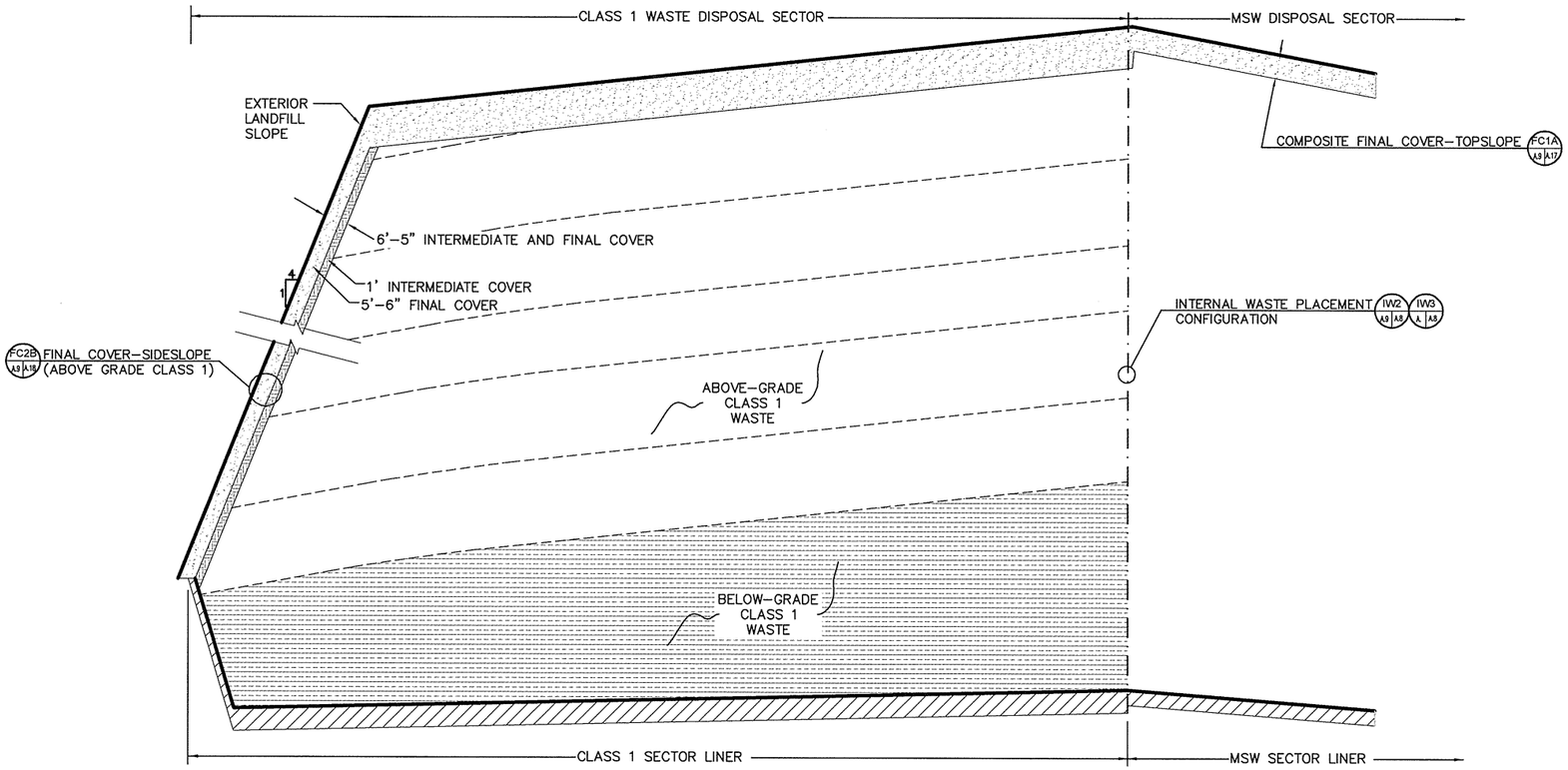

CLASS 1 WASTE CONFIGURATION WITH SOIL COVER LAYER AND ABOVE–GRADE PLACEMENT DETAIL IW1A B4,B6 A9

GENERALIZED CROSS SECTION

SCALE: N.T.S.

NOTES:

1. DETAIL IW1A ON THIS ATTACHMENT SHOWS A GENERALIZED CROSS SECTION OF A CLASS 1 WASTE DISPOSAL SECTOR, INCLUDING THE CONFIGURATION OF ABOVE–GRADE CLASS 1 WASTE PLACEMENT WITH 4.5–FOOT–THICK SOIL COVER LAYER.

2. THE ADDITIONAL ABOVE–GRADE CLASS 1 WASTE PLACEMENT WITH 4.5–FOOT–THICK SOIL COVER LAYER ALLOWS CLASS 1 WASTE TO BE FILLED ABOVE THE INITIAL PERIMETER BERM/CONTAINMENT DIKE OR ABOVE PREVIOUSLY CONSTRUCTED SIDESLOPE CONTAINMENT DIKES. FOR THIS OPTION, A 4.5–FOOT–THICK SOIL COVER LAYER WILL BE PLACED ON THE EXTERIOR SIDESLOPES, EXTENDING FROM THE TOP OF THE PERIMETER BERM/CONTAINMENT DIKE TO THE MAXIMUM CLASS 1 FILL ELEVATION. THE SOIL COVER LAYER WILL ALSO BE PLACED ON THE TOPSLOPE OF CLASS 1 DISPOSAL AREAS WHEN FILLED TO FINAL GRADE. THE FINAL COVER WILL BE CONSTRUCTED BY STRIPPING THE UPPER 3.5–FEET FROM THE SOIL COVER LAYER(SEE NOTE 4), AND CONSTRUCTING A FINAL COVER IN COMPLIANCE WITH 30 TAC 330.457 (b)(OR 30 TAC §335.590(24)(E)) AND INCLUDE A 4–FOOT–THICK COMPACTED CLAY–RICH INFILTRATION LAYER. THE FINAL COVER SYSTEM WILL BE CONSTRUCTED IN ACCORDANCE WITH ALL LABORATORY AND FIELD TESTING REQUIREMENTS SET FORTH IN SECTION 6.3 OF APPENDIX IIIA.

3. DURING CONSTRUCTION OF FINAL COVER, THE 3.5–FEET STRIPPED FROM THE SOIL COVER LAYER MAY BE USED TO CONSTRUCT FINAL COVER IF IT MEETS ALL REQUIRED FIELD AND LABORATORY TESTING IN ACCORDANCE WITH THE FINAL CLOSURE PLAN.

4. IN ACCORDANCE WITH 30 TAC §335.590(24)(F)(i), THE 4.5–FOOT–THICK SOIL COVER LAYER IS DESIGNED TO:
   - PREVENT WASHOUT, RELEASE, OR EXPOSURE OF WASTE;
   - BE PHYSICALLY STABLE;
   - PREVENT WASHOUT FROM HYDROSTATIC AND HYDRODYNAMIC FORCES FROM STORMS AND FLOODS;
   - PREVENT STORM WATER RUN–ON FROM REACHING THE WASTE;
   - MINIMIZE THE RELEASE OF LEACHATE; AND
   - MINIMIZE LONG TERM MAINTENANCE.

4. THE 4.5–FOOT–THICK SOIL COVER LAYER:
   - WILL BE CONSTRUCTED ALONG THE EXTERIOR SIDESLOPES AS PART OF SITE OPERATIONS FROM CLAY–RICH SOILS;
   - WILL BE PLACED IN 12–INCH THICK LOOSE LIFTS AND COMPACTED BY TRACKED EQUIPMENT OR OTHER COMPACTION EQUIPMENT;
   - WILL BE LOCATED OVER THE LINED AREA AT THE PERIMETER OF THE WASTE FOOTPRINT;
   - WILL BE MEASURED FOR THICKNESS BY SURVEY OR SETTLEMENT PLATES; AND
   - WILL BE CERTIFIED BY A TEXAS LICENSED PROFESSIONAL ENGINEER AFTER CONSTRUCTION.

5. THE 4.5–FOOT–THICK SOIL COVER LAYER WILL BE PLACED CONCURRENT WITH CLASS 1 WASTE PLACEMENT, WITH SLOPES COVERED IN 20–FOOT (VERTICAL) INCREMENTS.

6. REFER TO APPENDIX IIIO FOR CONSTRUCTION INFORMATION FOR ABOVE GRADE CLASS I SECTORS AND APPENDIX IIID FOR SOIL COVER INFORMATION.

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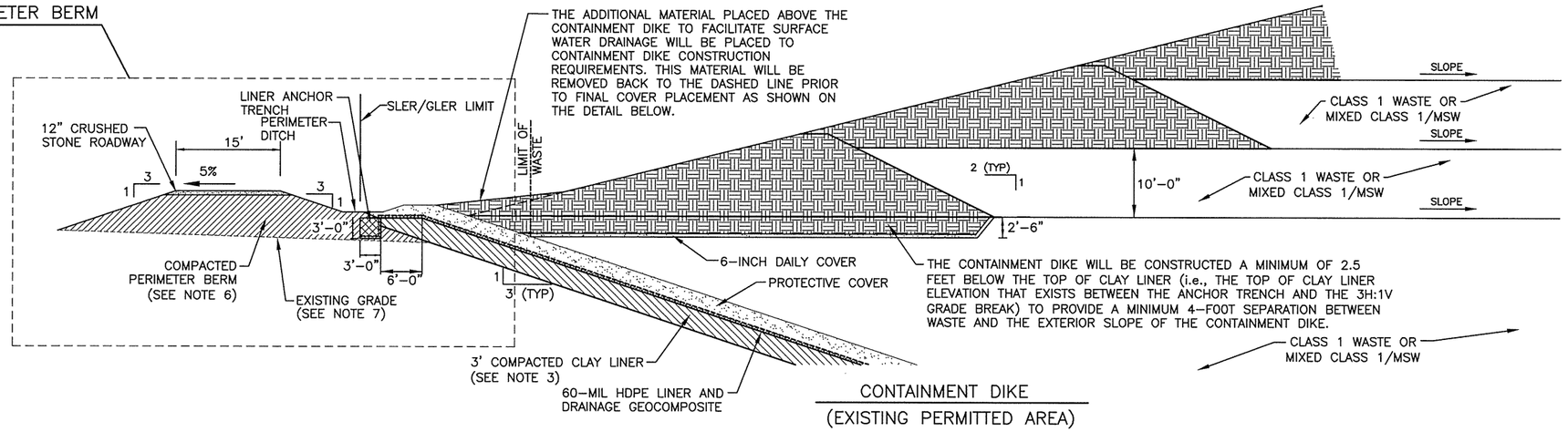
PB1 A.10 A.11 PERIMETER BERM

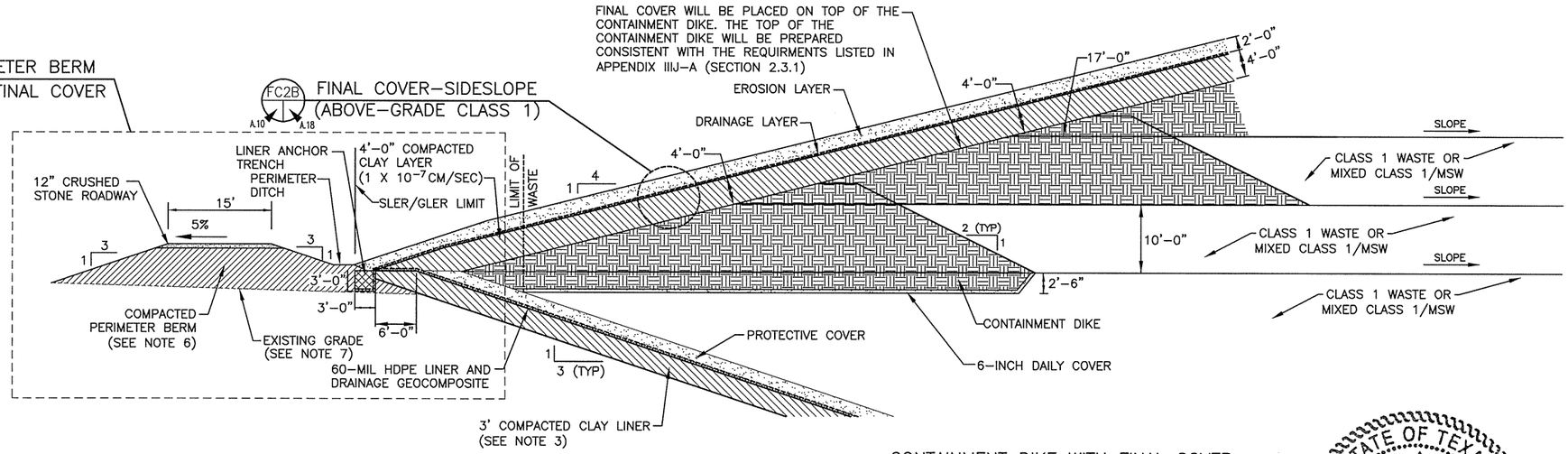


CONTAINMENT DIKE
(EXISTING PERMITTED AREA)

0 10 20
SCALE IN FEET

PB2 A.10 A.11 PERIMETER BERM WITH FINAL COVER

FC2B A.10 A.18 FINAL COVER–SIDESLOPE (ABOVE–GRADE CLASS 1)



CONTAINMENT DIKE WITH FINAL COVER
(EXISTING PERMITTED AREA)

0 10 20
SCALE IN FEET

NOTES:

1. CLASS 1 WASTE WILL BE DISPOSED OF ABOVE COMPACTED PERIMETER BERM GRADES WHEN CONTAINMENT DIKES ARE CONSTRUCTED. REFER TO APPENDIX IIIA, SECTION 6.3 FOR MORE INFORMATION.
2. CONTAINMENT DIKES WILL BE CONSTRUCTED IN AREAS WHERE THE DISPOSAL OF CLASS 1 WASTE WILL OCCUR ABOVE GRADE. THE CONTAINMENT DIKES WILL EXTEND ALONG THE BOTTOM OF FINAL COVER TO THE FINAL ELEVATION OF CLASS 1 WASTE DISPOSAL.
3. ALL AREAS WHICH RECEIVE CLASS 1 WASTE WILL HAVE A LINER SYSTEM CONSTRUCTED IN COMPLIANCE WITH 30 TAC §330.331(e).
4. REFER TO APPENDIX IIIA, SECTION 6.3 FOR INFORMATION REGARDING THE CONSTRUCTION OF CONTAINMENT DIKES.
5. EACH CONTAINMENT DIKE OPTION IS ONLY APPLICABLE FOR THOSE AREAS CONSTRUCTED IN ACCORDANCE WITH §330.331(e).
6. EXISTING GRADE LINE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. THE DEPTH OF FILL VARIES. AT A MINIMUM, VEGETATION WILL BE REMOVED AND EXISTING GRADE WILL BE SCARIFIED.

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CLASS 1 WASTE CONTAINMENT DIKE DETAILS

TURKEY CREEK LANDFILL
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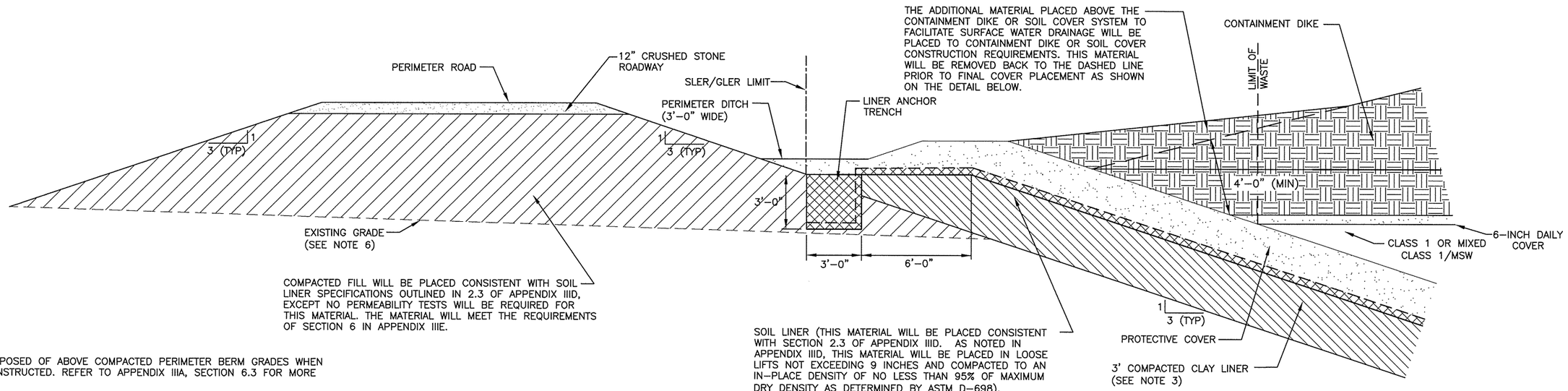


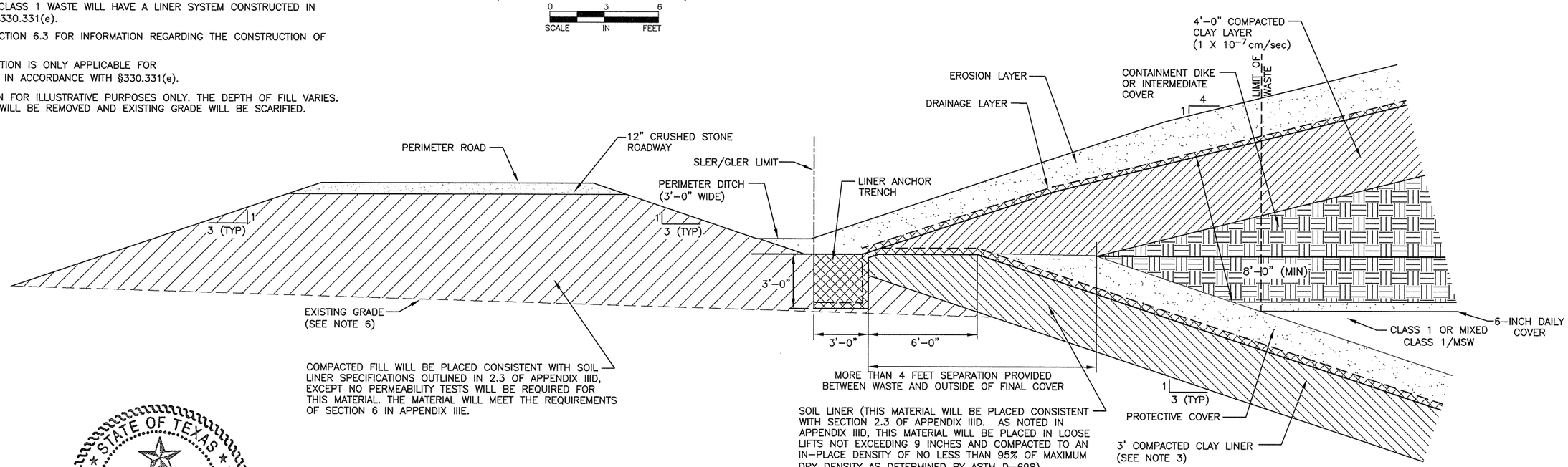
PERIMETER BERM (PB1 | A10 | A11)

(EXISTING PERMITTED AREA)

SCALE 0 3 6 IN FEET

NOTES:

1. CLASS 1 WASTE WILL BE DISPOSED OF ABOVE COMPACTED PERIMETER BERM GRADES WHEN CONTAINMENT DIKES ARE CONSTRUCTED. REFER TO APPENDIX IIIA, SECTION 6.3 FOR MORE INFORMATION.
2. CONTAINMENT DIKES WILL BE CONSTRUCTED IN AREAS WHERE THE DISPOSAL OF CLASS 1 WASTE WILL OCCUR ABOVE GRADE. THE CONTAINMENT DIKES WILL EXTEND ALONG THE BOTTOM OF FINAL COVER TO THE FINAL ELEVATION OF CLASS 1 WASTE DISPOSAL.
3. ALL AREAS WHICH RECEIVE CLASS 1 WASTE WILL HAVE A LINER SYSTEM CONSTRUCTED IN COMPLIANCE WITH 30 TAC §330.331(e).
4. REFER TO APPENDIX IIIA, SECTION 6.3 FOR INFORMATION REGARDING THE CONSTRUCTION OF CONTAINMENT DIKES.
5. EACH CONTAINMENT DIKE OPTION IS ONLY APPLICABLE FOR THOSE AREAS CONSTRUCTED IN ACCORDANCE WITH §330.331(e).
6. EXISTING GRADE LINE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. THE DEPTH OF FILL VARIES. AT A MINIMUM, VEGETATION WILL BE REMOVED AND EXISTING GRADE WILL BE SCARIFIED.



PERIMETER BERM WITH FINAL COVER (PB2 | A10 | A11)

(EXISTING PERMITTED AREA)

SCALE 0 3 6 IN FEET

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DATE: 02/2022 FILE: 0771–368–11 CAD: A.9 LINER DETAILS.DWG DRAWN BY: JDW DESIGN BY: DEP REVIEWED BY: NT	REVISIONS NO. | DATE | DESCRIPTION	
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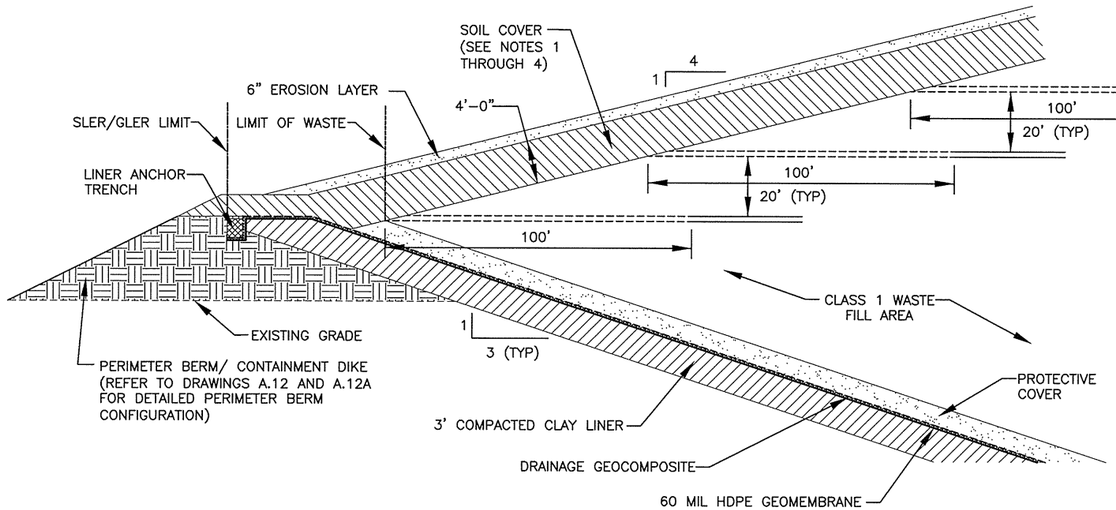
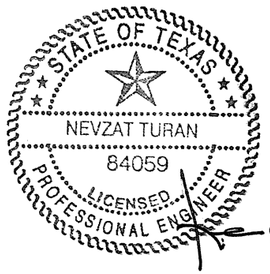


ABOVE GRADE CLASS 1 WASTE
AREA DURING SITE OPERATIONS
N.T.S.

SOIL COVER NOTES:

1. THE EROSION LAYER WILL CONSIST OF SOILS THAT CAN SUPPORT VEGETATION. THE BOTTOM 4 FEET OF THE SOIL COVER LAYER WILL CONSIST OF ON-SITE CLAY SOILS.
2. THE 4-FOOT-THICK PORTION OF THE SOIL COVER WILL BE PLACED IN 12-INCH LOOSE LIFTS AND COMPACTED BY TRACKED EQUIPMENT OR OTHER COMPACTION EQUIPMENT.
3. THE SOIL COVER WILL BE INSTALLED AFTER EACH 20-FOOT LIFT OF WASTE IS PLACED.
4. EROSION LAYER MAY CONSIST OF BOTH ONSITE AND OFF-SITE SOILS. BORROW SOURCE TO BE SELECTED BY OWNER PRIOR TO CONSTRUCTION.



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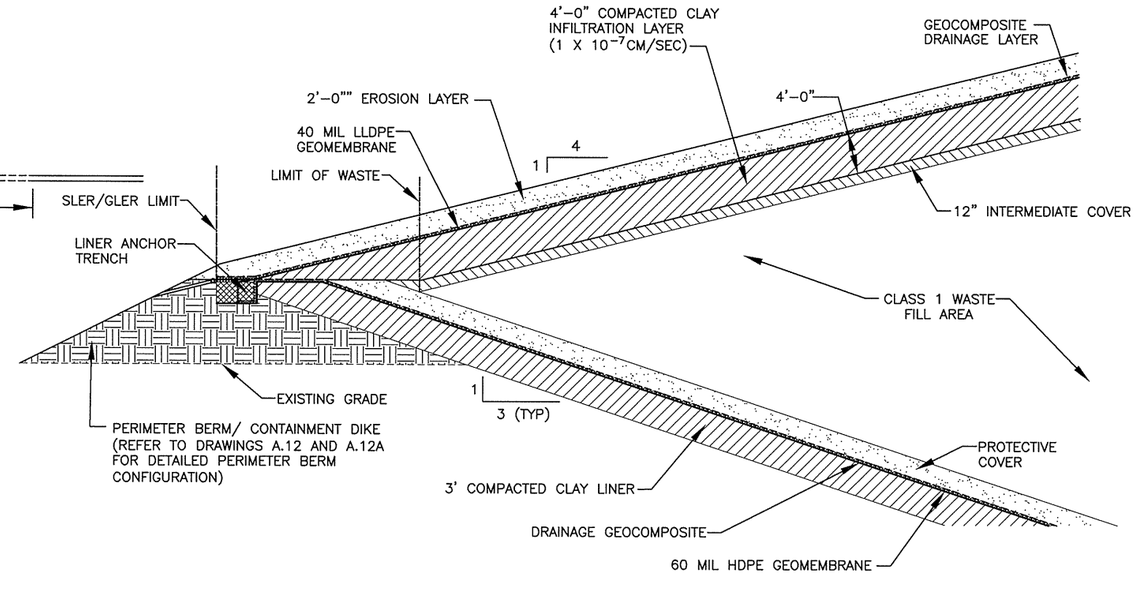

ABOVE GRADE CLASS 1 WASTE
AREA WITH FINAL COVER
N.T.S.

FINAL COVER NOTES:

1. A PORTION OF THE 4.5-FOOT-THICK SOIL COVER PLACED DURING SITE OPERATIONS WILL BE INCORPORATED INTO THE FINAL COVER, CONSISTENT WITH THE REQUIREMENTS OF THE FINAL COVER QUALITY CONTROL PLAN AND AS SUMMARIZED BELOW.

- THE 6-INCH-THICK EROSION LAYER WILL BE REMOVED AND STOCKPILED FOR FUTURE USE.
- THE TOP 3 FEET OF THE CLAY COVER WILL BE REMOVED AND REPLACED OR RE-WORKED TO MEET THE SPECIFICATION LISTED IN THE FINAL COVER QUALITY CONTROL PLAN. ALTERNATIVELY, THE POR MAY INVESTIGATE AND CERTIFY THE 3-FOOT THICK CLAY COVER MEETS OR EXCEEDS THE REQUIREMENTS OF FINAL COVER, ALLOWING IN-PLACE CLAY COVER BE INCORPORATED INTO THE FINAL COVER CONSTRUCTION. AN EXTRA FOOT OF MATERIAL WILL BE NEEDED TO MEET THE THICKNESS REQUIREMENT FOR THE COMPACTED CLAY INFILTRATION LAYER. THE BOTTOM 1-FOOT-THICK LAYER OF SOIL WILL REMAIN AS AN INTERMEDIATE COVER LAYER.

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CLASS 1 WASTE SOIL COVER SYSTEM DETAILS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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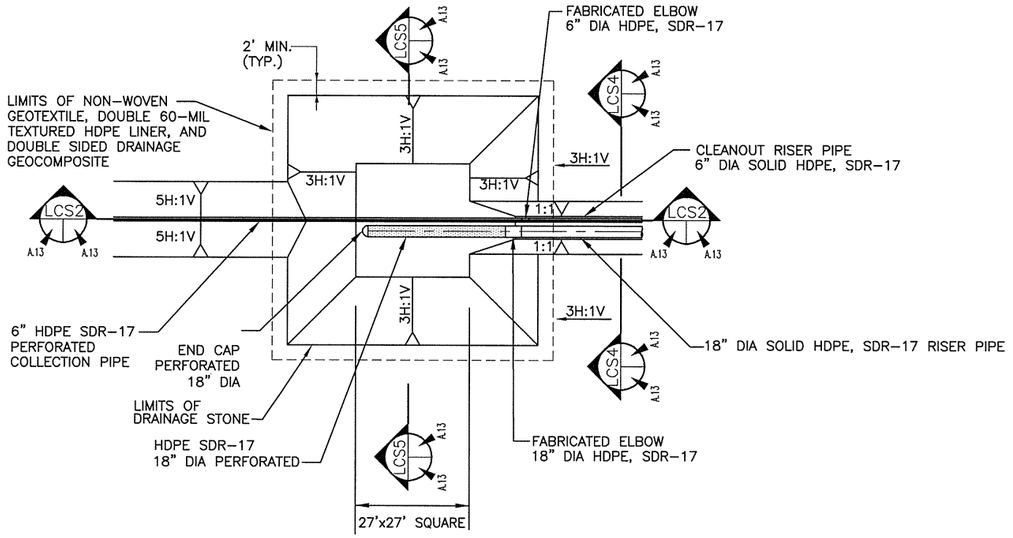
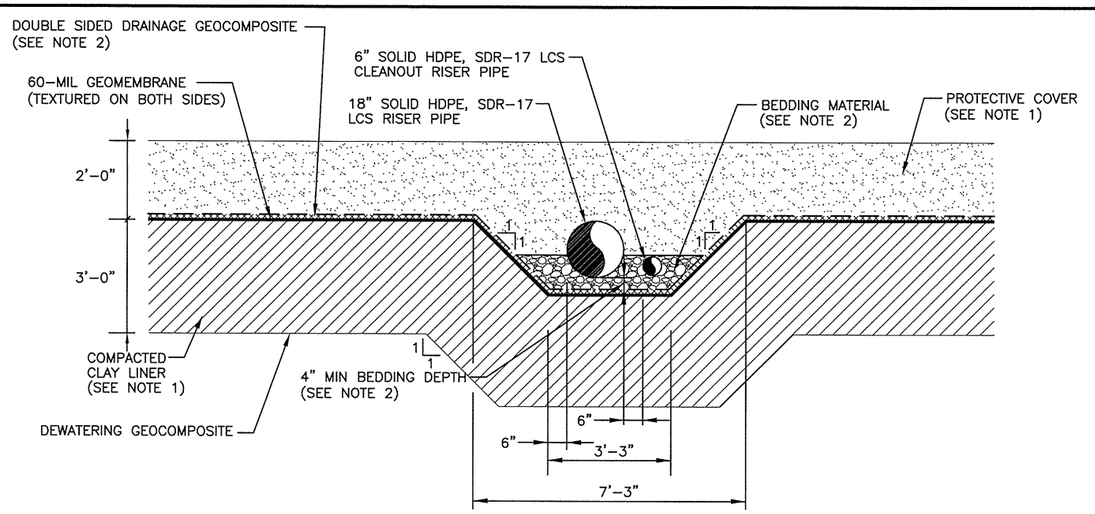


LEACHATE COLLECTION SUMP PLAN (LCS1)

NTS



LEACHATE RISER PIPES (LCS4)

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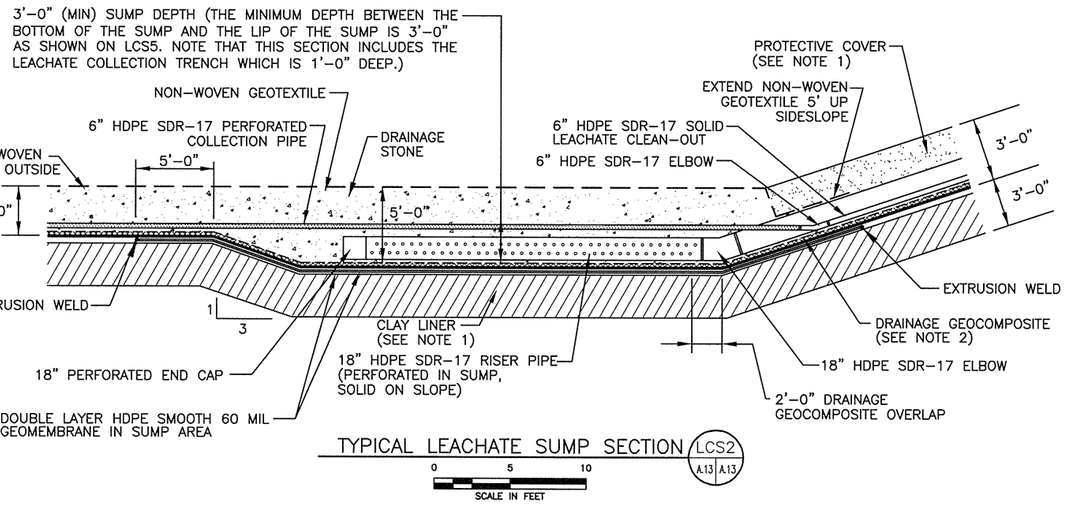

TYPICAL LEACHATE SUMP SECTION (LCS2)

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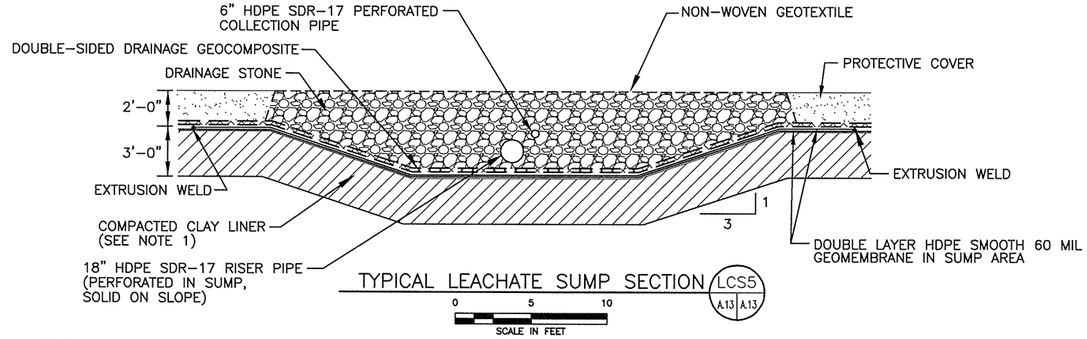

TYPICAL LEACHATE SUMP SECTION (LCS5)

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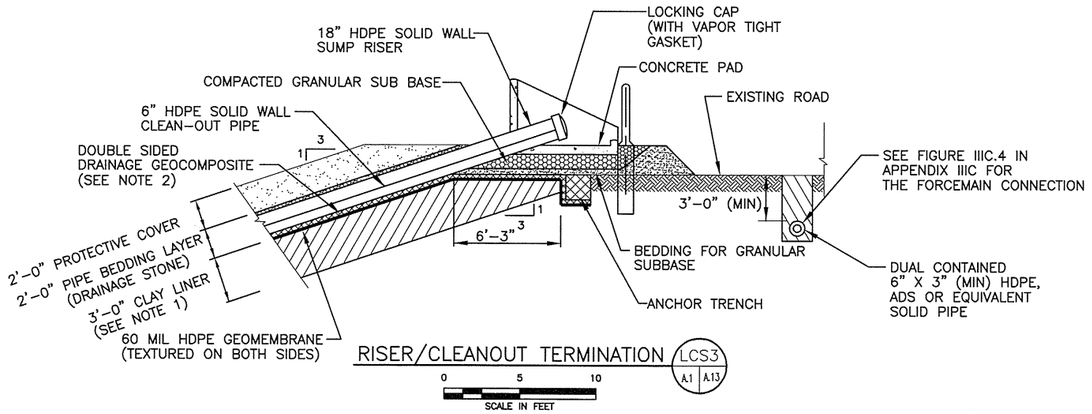

RISER/CLEANOUT TERMINATION (LCS3)

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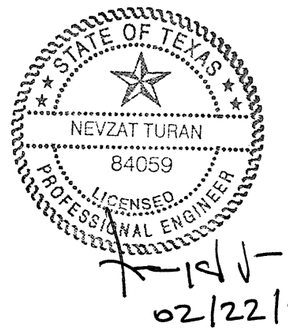

NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF THE COMPACTED CLAY LINER, GEOMEMBRANE LINER, AND PLACEMENT OF PROTECTIVE COVER WILL BE IN ACCORDANCE WITH APPENDIX IIID-LQCP.
2. DESIGN INFORMATION FOR THE LEACHATE COLLECTION SYSTEM (LCS) COMPONENTS ARE INCLUDED IN APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN. SPECIFICATIONS FOR LCS COMPONENTS ARE INCLUDED IN APPENDIX IIID-LQCP. DRAINAGE GEOCOMPOSITE FOR UNDEVELOPED LINER AREAS CONSISTS OF A 250-MIL GEONET WITH 6 OZ/SY GEOTEXTILE HEAT BONDED ON THE TOP SIDE FOR THE BOTTOM LINER AND HEAT BONDED GEOTEXTILE (6 OZ/SY) ON BOTH SIDES FOR GEOCOMPOSITE ON 3H:1V SIDESLOPES.

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REVIEWED BY: NT

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REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT LEACHATE COLLECTION SYSTEM DETAILS (CLASS 1 AREA)

TURKEY CREEK LANDFILL
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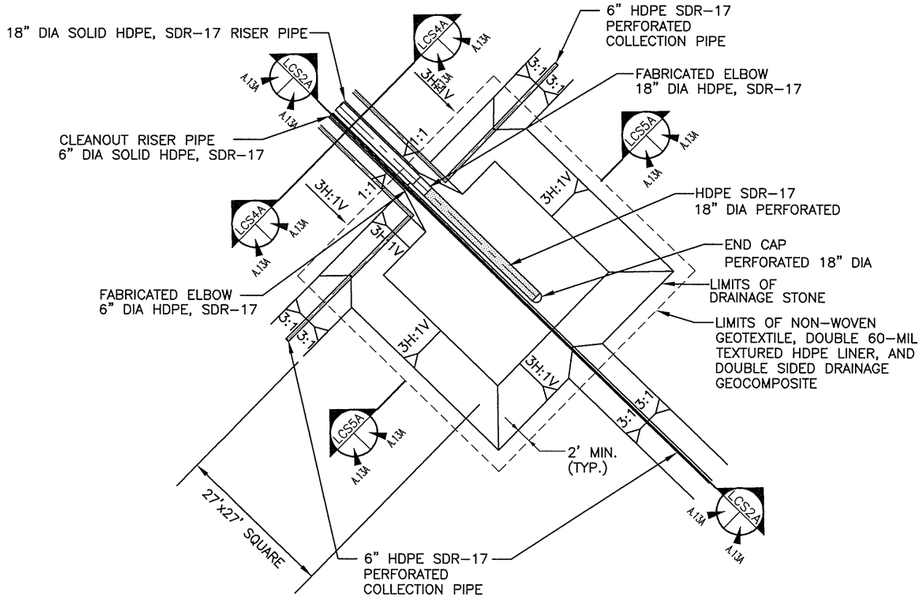
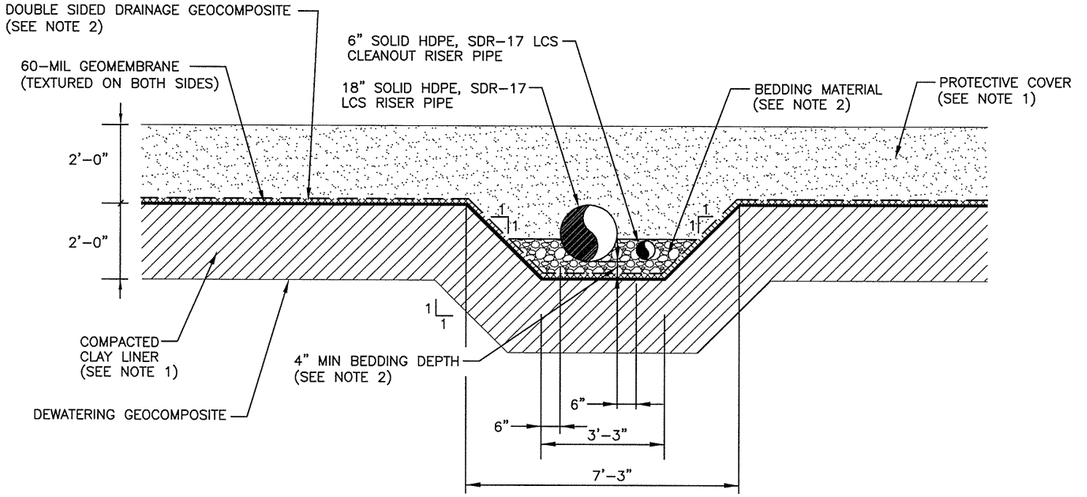
O:\0771\368\EXPANSION 2021\PART II\IIIA\A.13-LEACHATE COLL SYS DETAILS.dwg, rarrington, 1:2



LEACHATE COLLECTION SUMP PLAN LCS1A

NTS

A.1 A.13A



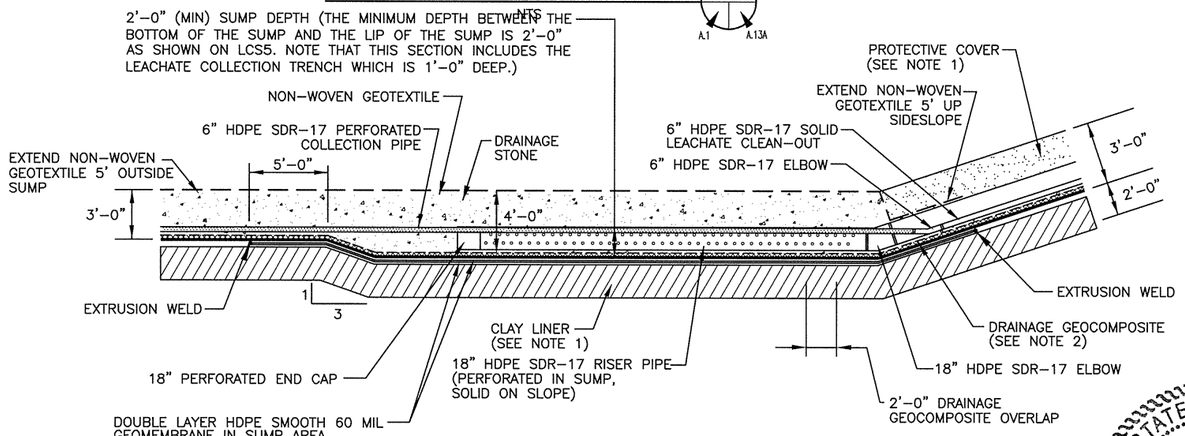
LEACHATE RISER PIPES LCS4A

A.13A A.13A

0 2 4

SCALE IN FEET

2'-0" (MIN) SUMP DEPTH (THE MINIMUM DEPTH BETWEEN THE BOTTOM OF THE SUMP AND THE LIP OF THE SUMP IS 2'-0" AS SHOWN ON LCS5. NOTE THAT THIS SECTION INCLUDES THE LEACHATE COLLECTION TRENCH WHICH IS 1'-0" DEEP.)

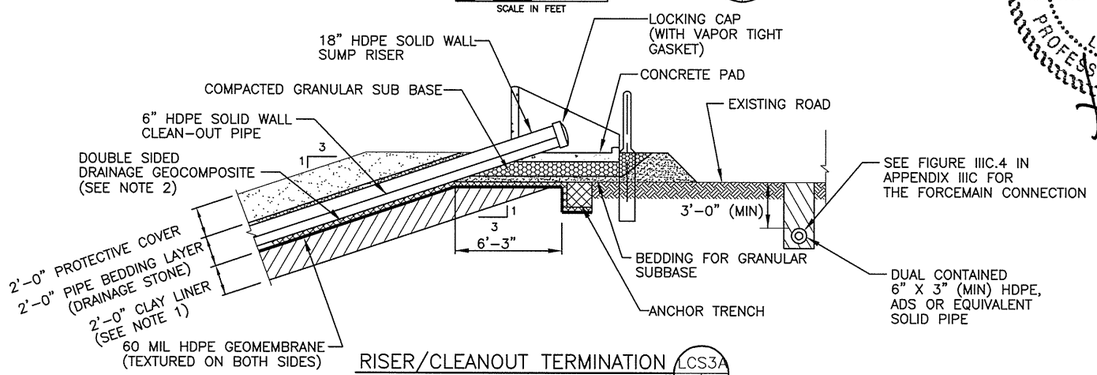


TYPICAL LEACHATE SUMP SECTION LCS2A

0 5 10

SCALE IN FEET

A.13A A.13A



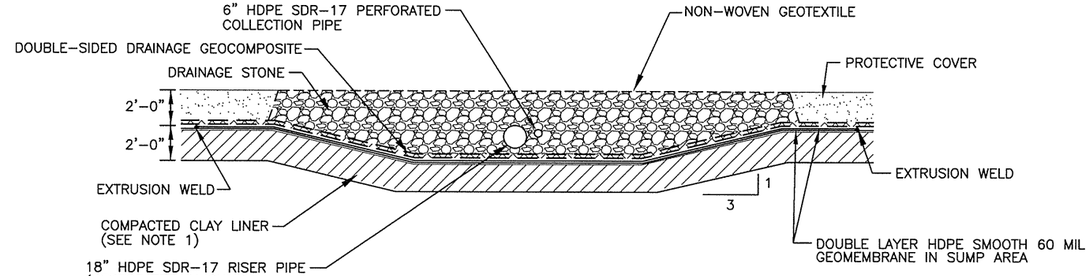
RISER/CLEANOUT TERMINATION LCS3A

0 5 10

SCALE IN FEET

A.1 A.13A





TYPICAL LEACHATE SUMP SECTION LCS5A

0 5 10

SCALE IN FEET

A.13A A.13A

NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF THE COMPACTED CLAY LINER, GEOMEMBRANE LINER, AND PLACEMENT OF PROTECTIVE COVER WILL BE IN ACCORDANCE WITH APPENDIX IIID-LQCP.
2. DESIGN INFORMATION FOR THE LEACHATE COLLECTION SYSTEM (LCS) COMPONENTS ARE INCLUDED IN APPENDIX IIIC-LEACHATE AND CONTAMINATED WATER MANAGEMENT PLAN. SPECIFICATIONS FOR LCS COMPONENTS ARE INCLUDED IN APPENDIX IIID-LQCP. DRAINAGE GEOCOMPOSITE FOR UNDEVELOPED LINER AREAS CONSISTS OF A 250-MIL GEONET WITH 6 OZ/SY GEOTEXTILE HEAT BONDED ON THE TOP SIDE FOR THE BOTTOM LINER AND HEAT BONDED GEOTEXTILE (6 OZ/SY) ON BOTH SIDES FOR GEOCOMPOSITE ON 3H:1V SIDESLOPES.

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DATE: 12/2021
FILE: 0771-368-11
CAD: A.13A LEACHATE DTLS.DWG

DRAWN BY: JDW
DESIGN BY: DEP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

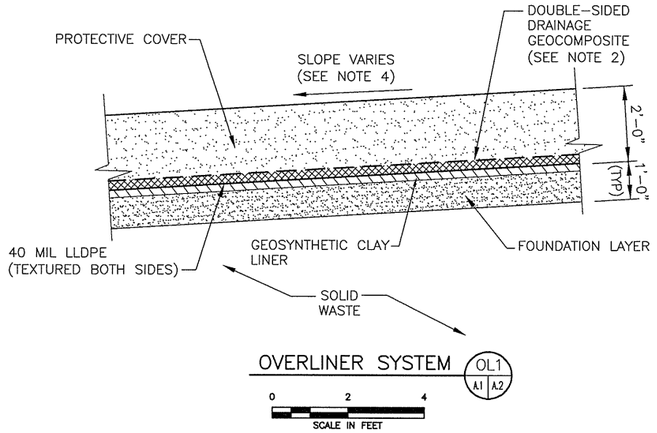
MAJOR PERMIT AMENDMENT LEACHATE COLLECTION SYSTEM DETAILS (MSW AREA)

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

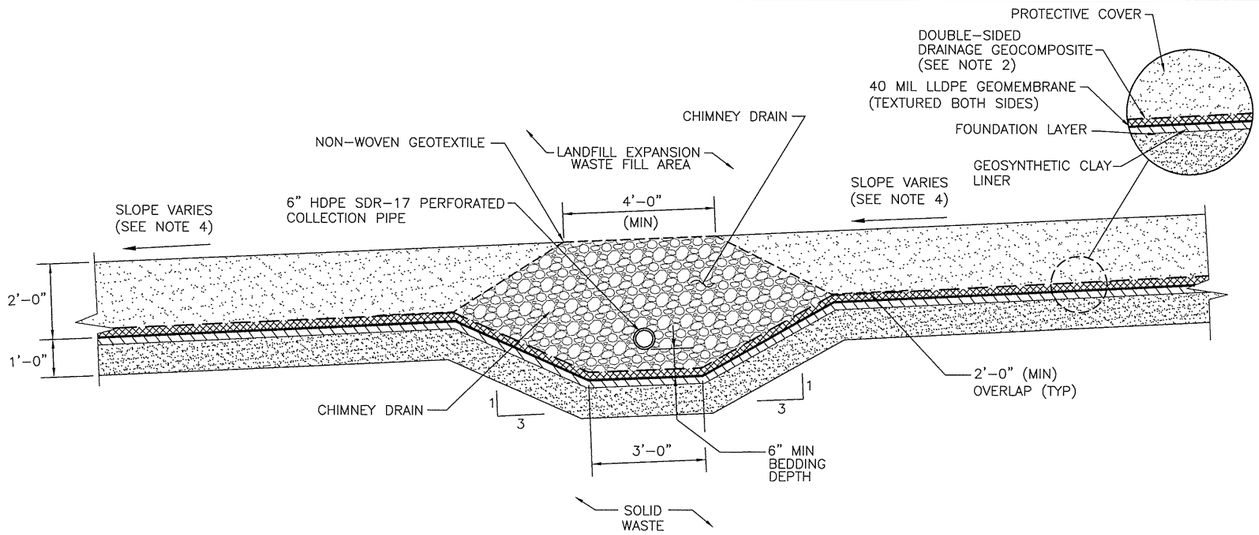
DRAWING A.13A

O:\0771\368\EXPANSION 2021\PART III\IIIA\A.13A-LEACHATE COLL SYS DETAILS.dwg, rarrington, 1:2



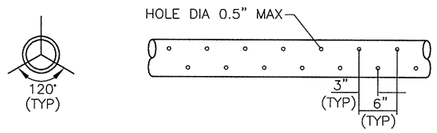
OVERLINER SYSTEM OL1 (A.1 | A.2)

0 2 4
SCALE IN FEET



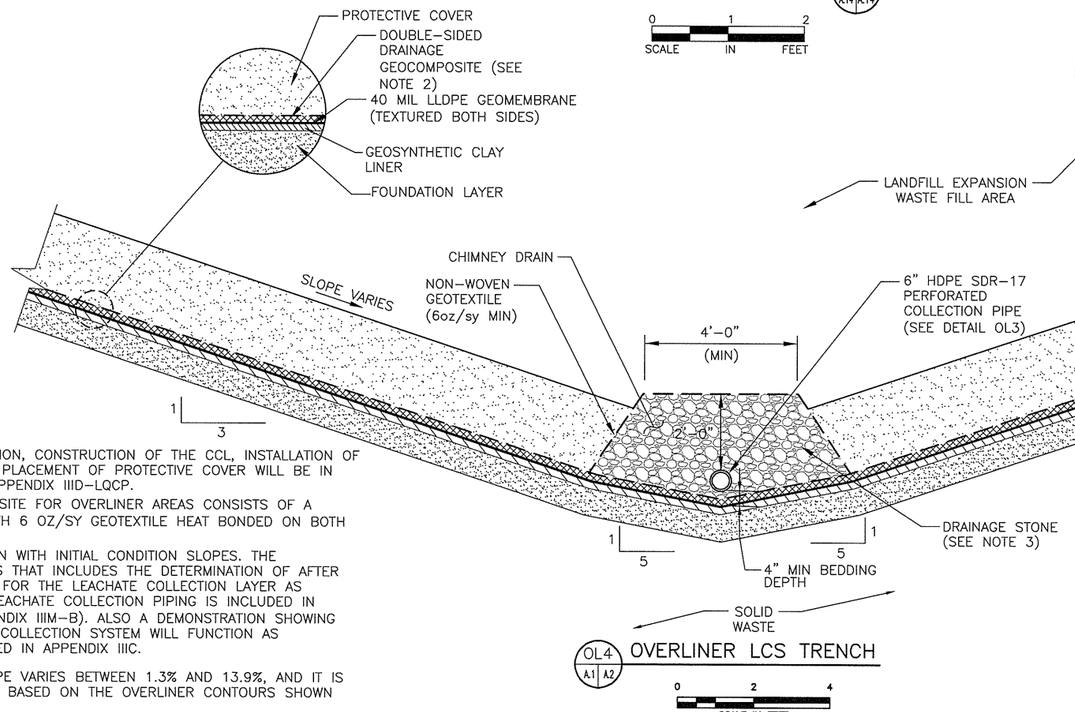
OVERLINER LCS TRENCH OL2 (A.1 | A.2)

0 2 4
SCALE IN FEET



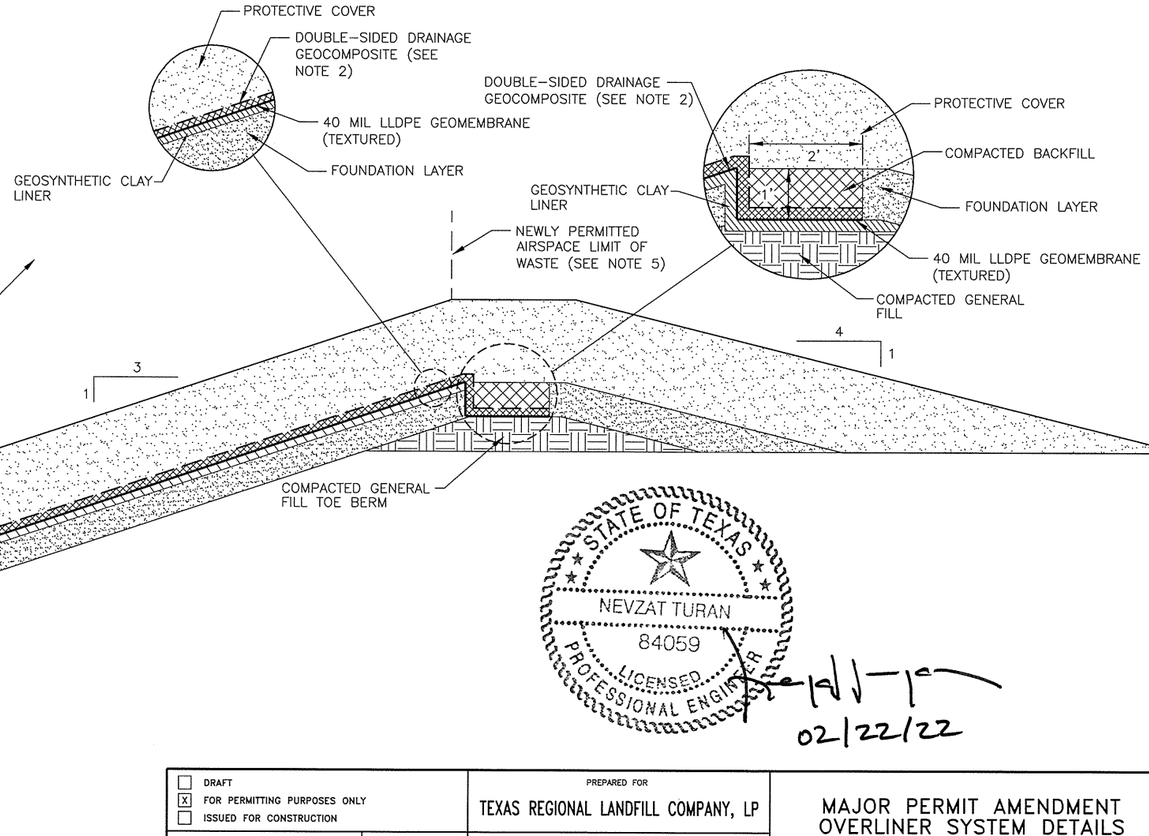
PERFORATED PIPE OL3 (A.14 | A.14)

0 1 2
SCALE IN FEET



OL4 OVERLINER LCS TRENCH (A.1 | A.2)

0 2 4
SCALE IN FEET



NOTES:

1. SUBGRADE PREPARATION, CONSTRUCTION OF THE CCL, INSTALLATION OF GEOSYNTHETICS AND PLACEMENT OF PROTECTIVE COVER WILL BE IN ACCORDANCE WITH APPENDIX IIID–LQCP.
2. DRAINAGE GEOCOMPOSITE FOR OVERLINER AREAS CONSISTS OF A 300–MIL GEONET WITH 6 OZ/SY GEOTEXTILE HEAT BONDED ON BOTH SIDES.
3. THE DETAIL IS SHOWN WITH INITIAL CONDITION SLOPES. THE SETTLEMENT ANALYSIS THAT INCLUDES THE DETERMINATION OF AFTER SETTLEMENT SLOPES FOR THE LEACHATE COLLECTION LAYER AS WELL AS FOR THE LEACHATE COLLECTION PIPING IS INCLUDED IN APPENDIX IIIM (APPENDIX IIIM–B). ALSO A DEMONSTRATION SHOWING THAT THE LEACHATE COLLECTION SYSTEM WILL FUNCTION AS DESIGNED IS INCLUDED IN APPENDIX IIIC.
4. THE OVERLINER SLOPE VARIES BETWEEN 1.3% AND 13.9%, AND IT IS 25% ON SIDESLOPES BASED ON THE OVERLINER CONTOURS SHOWN ON DRAWING A.1.
5. NORTH SIDE OF EXISTING PRE–SUBTITLE D AREA THAT WILL NOT RECEIVE NEWLY PERMITTED WASTE. NEWLY PERMITTED LIMIT OF WASTE IS AT LEAST 125 FEET FROM THE PERMIT BOUNDARY.
6. DETAILS ARE SHOWN WITH GCL OPTION. 2–FEET THICK COMPACTED CLAY MAY BE USED IN PLACE OF GCL AS SHOWN IN LINER DETAILS.

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STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER

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DATE: 02/2022
FILE: 0771–368–11
CAD: A.14 LEACHATE DTLS.DWG
DRAWN BY: JDW
DESIGN BY: DEP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

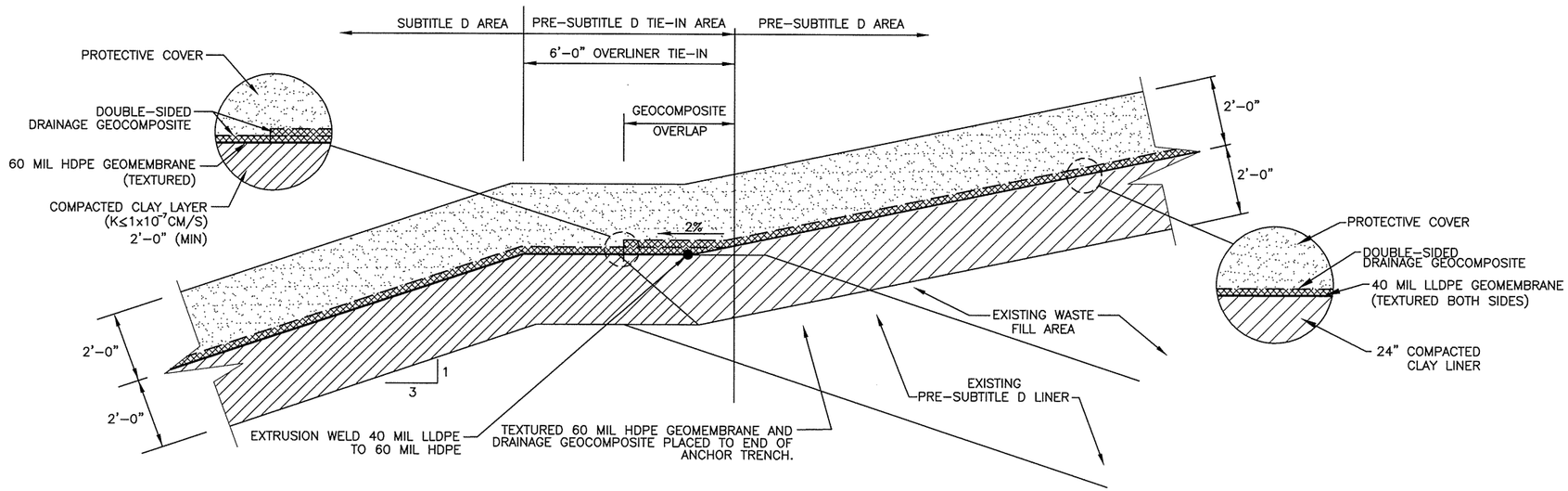
MAJOR PERMIT AMENDMENT
OVERLINER SYSTEM DETAILS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

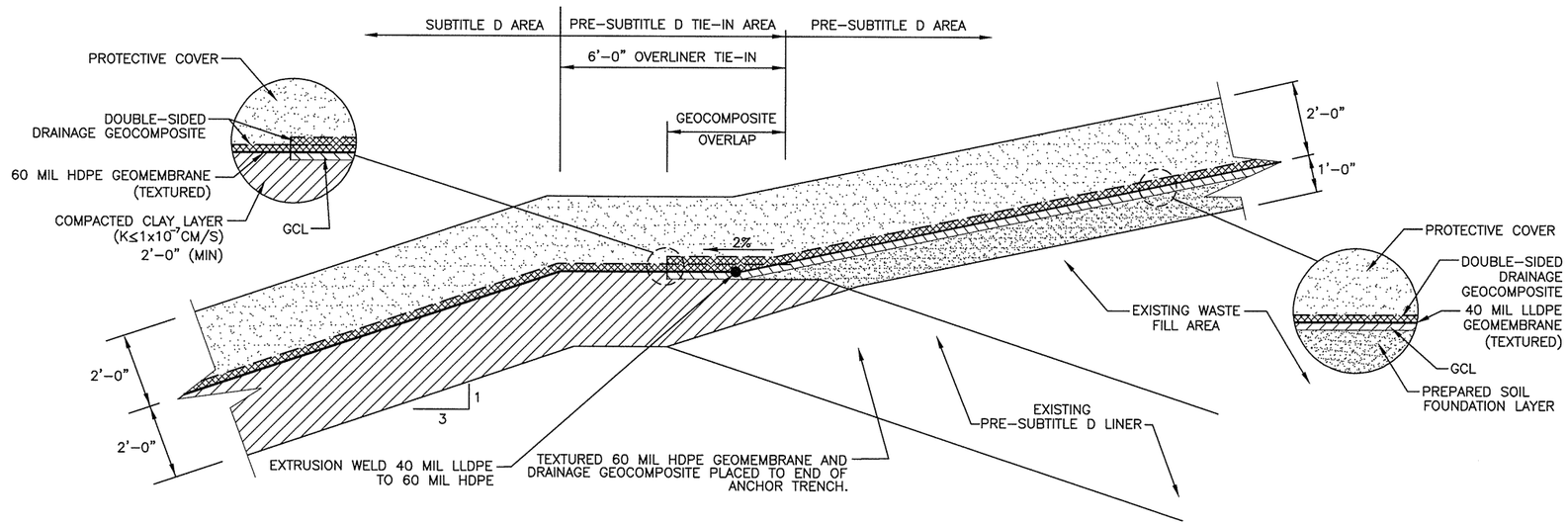
WWW.WCGRP.COM

DRAWING A.14

O:\0771\368\EXPANSION 2021\PART III\IIIA\A.14–OVERLINER DETAILS.dwg, rarrington, 1:2



WITH OVERLINER OPTION 1



WITH OVERLINER OPTION 2

OL4 / A2 A.15 SUBTITLE D OVERLINER TIE-IN

0 2 4
SCALE IN FEET

STATE OF TEXAS
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PROFESSIONAL ENGINEER
02/22/22

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DATE: 02/2022 FILE: 0771-368-11 CAD: A.15 OVERLINER DTLS.DWG DRAWN BY: JDW DESIGN BY: DEP REVIEWED BY: NT	REVISIONS NO. / DATE / DESCRIPTION	TURKEY CREEK LANDFILL JOHNSON COUNTY, TEXAS
Weaver Consultants Group TBPE REGISTRATION NO. F-3727		WWW.WCGRP.COM DRAWING A.15

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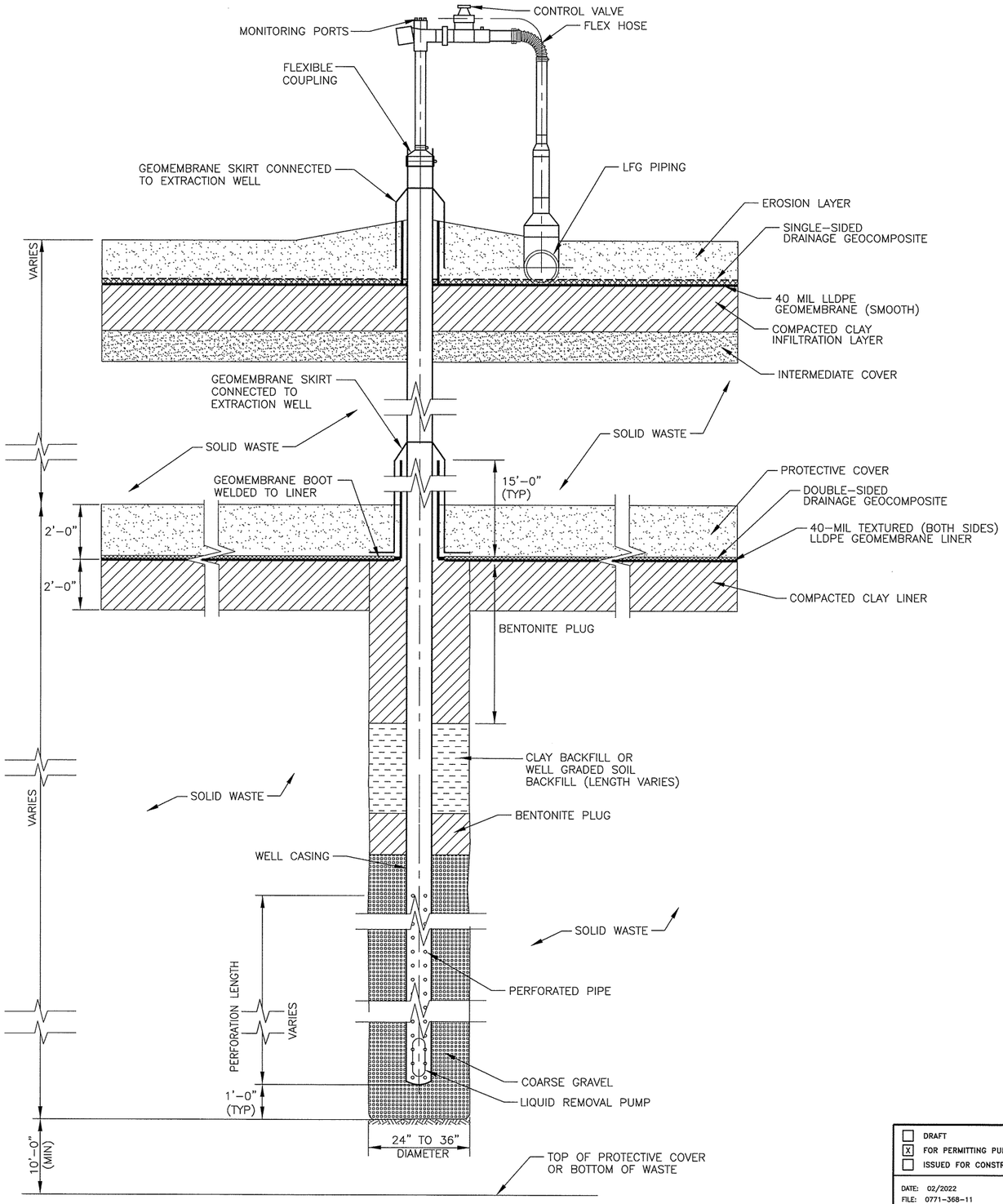
O:\0771\368\EXPANSION 2021\PART III\IIIA\A.15-OVERLINER DETAILS.dwg, rarrington, 1:2



TYPICAL LFG EXTRACTION WELL
INSTALLED DURING SEPARATORY OVERLINER SYSTEM CONSTRUCTION

NTS

LFG A-16

8.4,8.5,8.6

NOTES:

1. TURKEY CREEK LANDFILL MAY EXTEND EXISTING LFG EXTRACTION WELLS WITH SOLID PIPING TO APPLY VACUUM TO THE PRE–SUBTITLE D AREA BELOW THE OVERLINER.

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DATE: 02/2022
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CAD: A.16 OVERLINER DTLS.DWG

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DESIGN BY: DEP
REVIEWED BY: NT

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TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
OVERLINER SYSTEM TYPICAL
LFG EXTRACTION WELL DETAIL

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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DRAWING A.16

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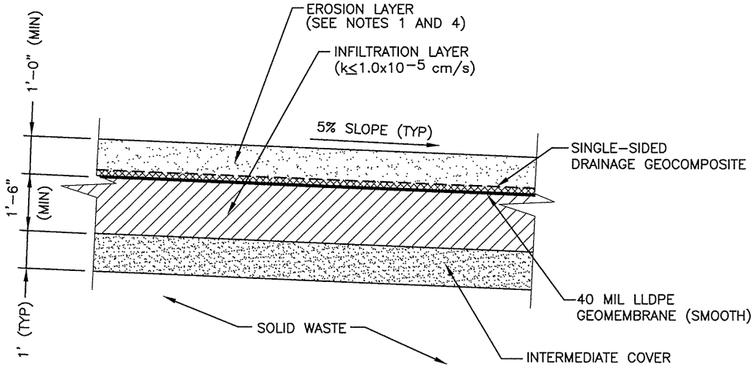
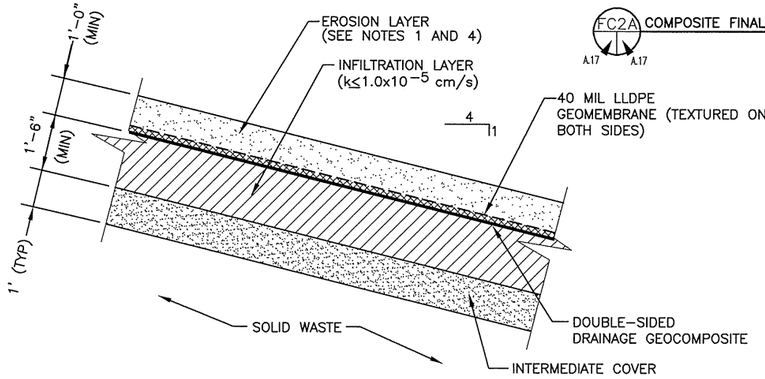
O:\0771\368\EXPANSION 2021\PART III\IIIA\A.16-LFG EXTRACTION WELL DETAILS.dwg, rarrington, 1:2



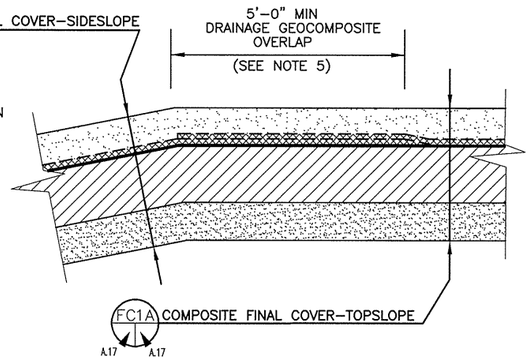
COMPOSITE FINAL COVER−TOPSLOPE FC1A A.17
A.3,A.8,A.9,B.4,B.5,B.6

0 2 4
SCALE IN FEET



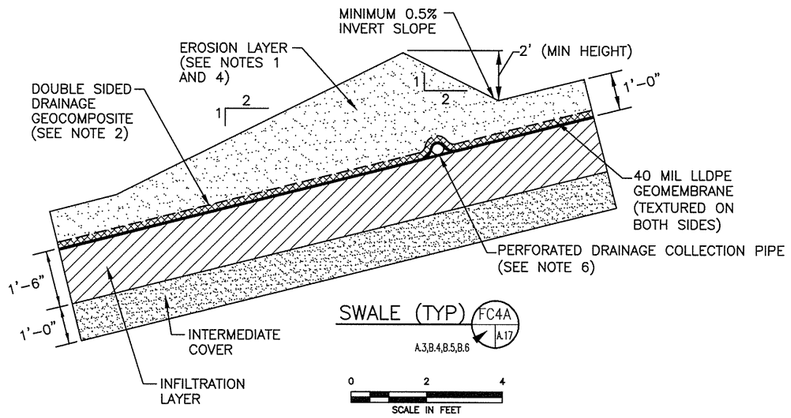
COMPOSITE FINAL COVER−SIDESLOPE FC2A A.17
A.3,A.17,B.4,B.5,B.6

0 2 4
SCALE IN FEET



COMPOSITE FINAL COVER−
TOP/SIDESLOPE TRANSITION FC3A A.17
A.3,B.4,B.5,B.6

0 2 4
SCALE IN FEET



SWALE (TYP) FC4A A.17
A.3,B.4,B.5,B.6

0 2 4
SCALE IN FEET

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER

02/22/22

NOTES:

1. FINAL COVER OF EROSION LAYER WILL BE CAPABLE OF SUSTAINING SELECTED VEGETATION.
2. DRAINAGE LAYER CONSISTS OF A 300−MIL GEOCOMPOSITE−HDPE GEONET OVERLAIN BY A 6 OZ/SY GEOTEXTILE LINER (SINGLE−SIDED ON TOPSLOPES AND DOUBLE−SIDED ON SIDESLOPES), OR ENGINEER APPROVED EQUIVALENT.
3. FINAL COVER COMPONENTS WILL BE CONSTRUCTED ACCORDING TO FCSQCP.
4. EROSION LAYER MAY CONSIST OF BOTH ONSITE AND OFF−SITE SOILS. BORROW SOURCE TO BE SELECTED BY OWNER PRIOR TO CONSTRUCTION.
5. SINGLE−SIDED DRAINAGE GEOCOMPOSITE WILL OVERLAP THE DOUBLE−SIDED DRAINAGE GEOCOMPOSITE WITHIN THE FINAL COVER SLOPE TRANSITION.
6. SHEET IIIE−A−16 IN APPENDIX IIIE−A SHOWS THE FINAL COVER PIPE SPACING. PIPE DESIGN IS SUMMARIZED ON SHEETS IIIE−A−1 THROUGH IIIE−A−15 IN APPENDIX IIIE−A. THE DRAINAGE COLLECTION PIPE IS SECURED TO THE DRAINAGE GEOCOMPOSITE BY USING ZIP TIES AT A MINIMUM FREQUENCY OF 50 FEET. AS AN OPTION TO THE DRAINAGE COLLECTION PIPE THE DRAINAGE GEOCOMPOSITE MAY BE DAYLIGHTED 2 FEET ABOVE THE SWALE FLOWLINE.

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DATE: 02/2022
FILE: 0771−368−11
CAD: A.17 OVERLINER DTLS.DWG

DRAWN BY: JDW
DESIGN BY: DEP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F−3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
FINAL COVER DETAILS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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DRAWING A.17

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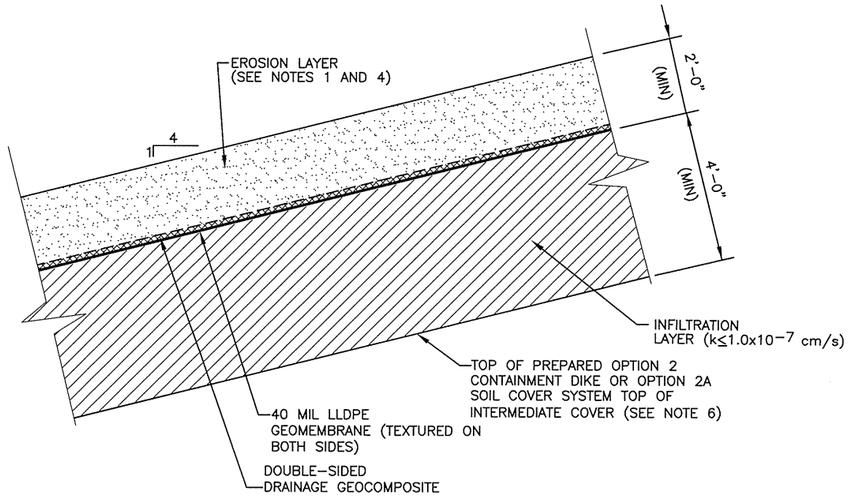
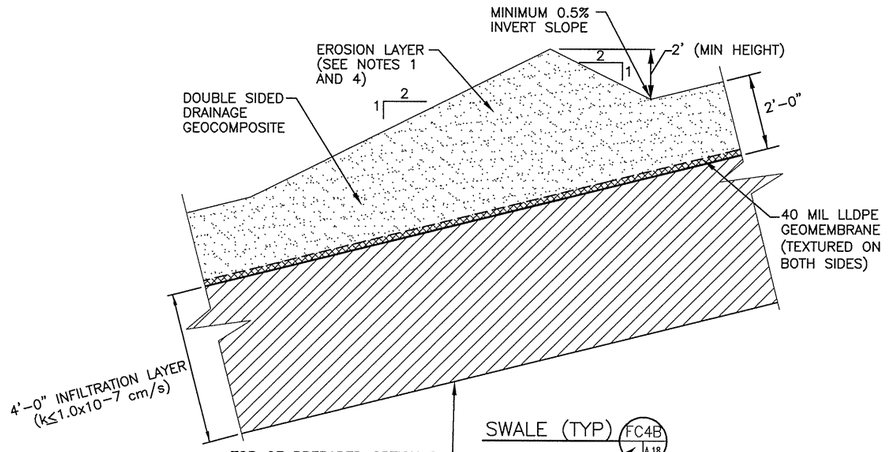


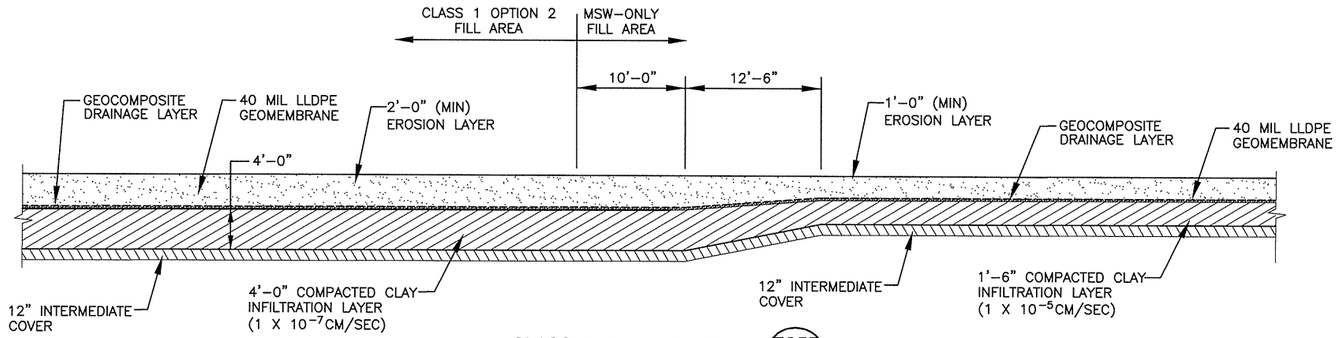
FINAL COVER–SIDESLOPE (ABOVE–GRADE CLASS 1) FC2B A.18
A.3,A.8,A.9,B.4,B.6

0 1 2 4
SCALE IN FEET



SWALE (TYP) FC4B A.18
A.3,B.4,B.6

0 1 2 4
SCALE IN FEET



CLASS 1 TO MSW ONLY FINAL COVER TIE–IN FC3B A.3 A.18

N.T.S.

NOTES:

1. TOP 6" OF EROSION LAYER WILL BE CAPABLE OF SUSTAINING SELECTED VEGETATION.
2. DRAINAGE LAYER CONSISTS OF A 250–MIL GEOCOMPOSITE–HDPE GEONET OVERLAIN BY AN 6 OZ/SY GEOTEXTILE LAYER.
3. FINAL COVER COMPONENTS WILL BE CONSTRUCTED ACCORDING TO FCSQCP.
4. EROSION LAYER MAY CONSIST OF BOTH ONSITE AND OFF–SITE SOILS. BORROW SOURCE TO BE SELECTED BY OWNER PRIOR TO CONSTRUCTION.
5. REFER TO FCSQCP FOR PROCEDURES FOR PREPARATION OF CONTAINMENT DIKES AND SOIL COVER SYSTEM PRIOR TO FINAL COVER PLACEMENT.
6. DETAILS SHOWN ON THIS PAGE ARE APPLICABLE TO BOTH CONTAINMENT DIKES AND SOIL COVER SYSTEM.

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED PROFESSIONAL ENGINEER

02/22/22

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DATE: 02/2022
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CAD: A.18 FINAL COVER DTLS.DWG
DRAWN BY: JDW
DESIGN BY: DEP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

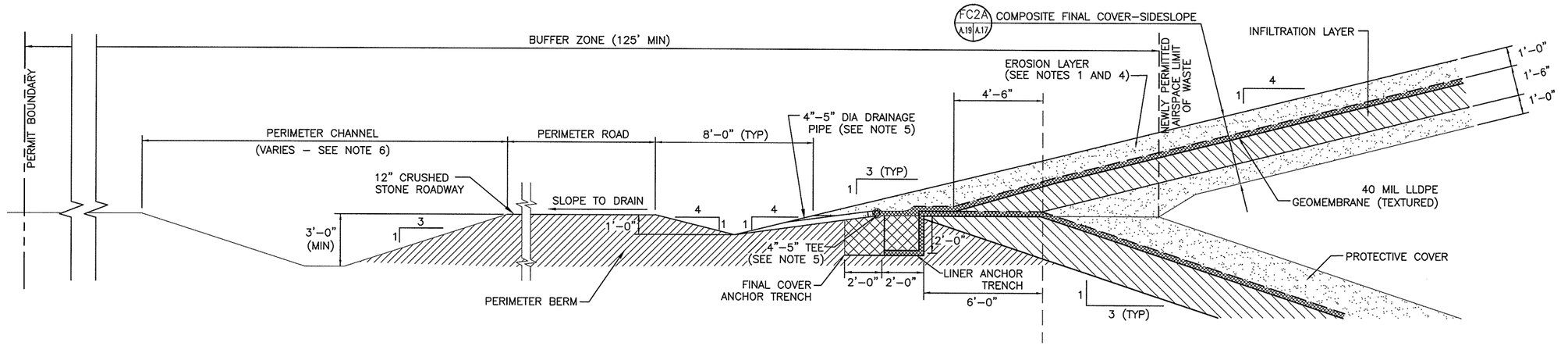
MAJOR PERMIT AMENDMENT
FINAL COVER DETAILS (CLASS 1)

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

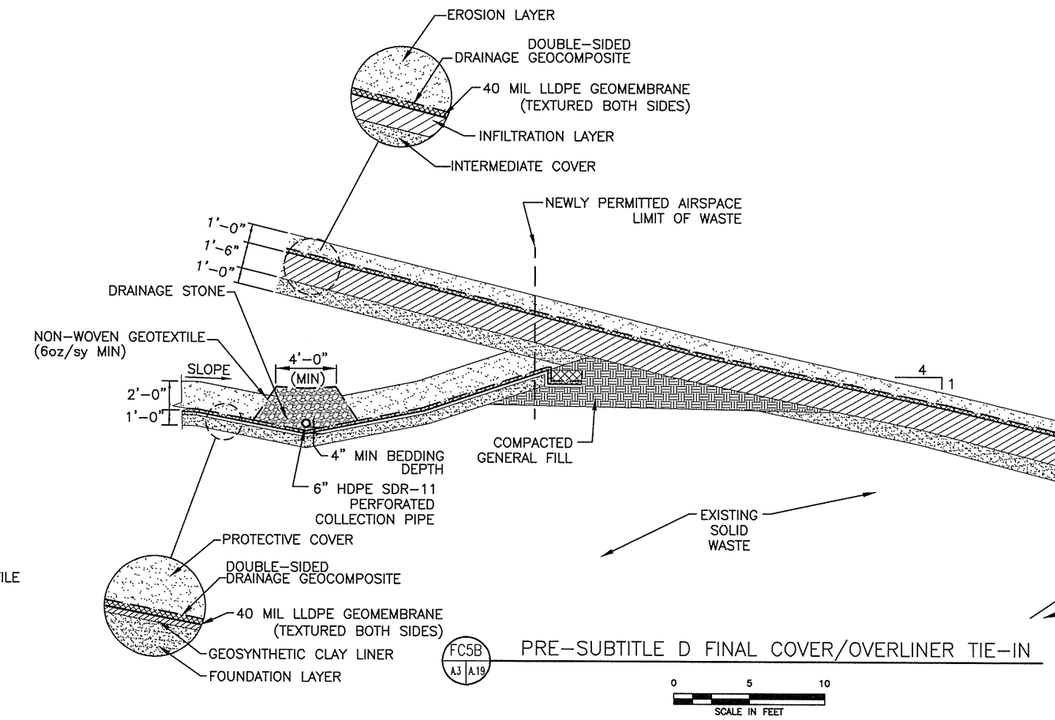
DRAWING A.18

0:\0771\368\EXPANSION 202\PART III\IIIA\A.18–FINAL COVER DETAILS.dwg, rarrington, 1:2



LINER/FINAL COVER TIE–IN (MSW) FC5A A.3 A.19

0 3 6
SCALE IN FEET



PRE–SUBTITLE D FINAL COVER/OVERLINER TIE–IN FC5B A.3 A.19

0 5 10
SCALE IN FEET

NOTES:

1. EROSION LAYER WILL BE CAPABLE OF SUSTAINING SELECTED VEGETATION.
2. FINAL COVER DRAINAGE LAYER CONSISTS OF A 250–MIL GEOCOMPOSITE–HDPE GEONET OVERLAIN BY A 6 OZ/SY GEOTEXTILE LAYER (SINGLE–SIDED ON TOPSLOPES AND DOUBLE–SIDED ON SIDESLOPES), OR ENGINEER APPROVED EQUIVALENT.
3. FINAL COVER COMPONENTS WILL BE CONSTRUCTED ACCORDING TO FCQCP (APPENDIX IIIE).
4. EROSION LAYER MAY CONSIST OF BOTH ONSITE AND OFF–SITE SOILS. BORROW SOURCE TO BE SELECTED BY OWNER PRIOR TO CONSTRUCTION.
5. REFER TO APPENDIX IIIE–A FOR THE DRAINAGE COLLECTION PIPE DESIGN. ALSO REFER TO DETAIL FC4A AND FC4B ON DRAWINGS A.15 AND A.16.
6. REFER TO APPENDIX IIIF FOR THE PERIMETER CHANNEL DESIGN.
7. DETAIL FC5 REFERENCED FOR MSW AREA ONLY. REFER TO DRAWING A.8 THROUGH A.10 FOR LINER/FINAL COVER TIE–IN DETAILS FOR THE CLASS 1 AREA.

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STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER
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DATE: 02/2022
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DESIGN BY: DEP
REVIEWED BY: NT

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
LINER/FINAL COVER TIE–IN DETAILS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

DRAWING A.19

0:\0771\360\EXPANSION 2021\PART III\IIIA\A.19–FINAL COVER DETAILS.dwg, rarrington, 1:2

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

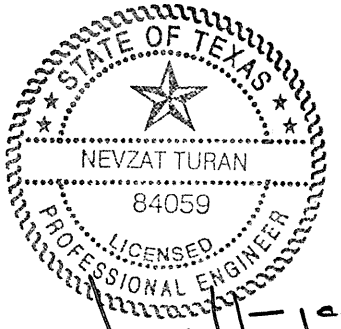
MAJOR PERMIT AMENDMENT APPLICATION

PART III – SITE DEVELOPMENT PLAN
APPENDIX IIIA-B
LANDFILL UNIT CROSS SECTIONS

Prepared for

Texas Regional Landfill Company, LP

February 2022



Prepared by

Weaver Consultants Group, LLC
TBPE Registration No. F-3727
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0771-368-11-123

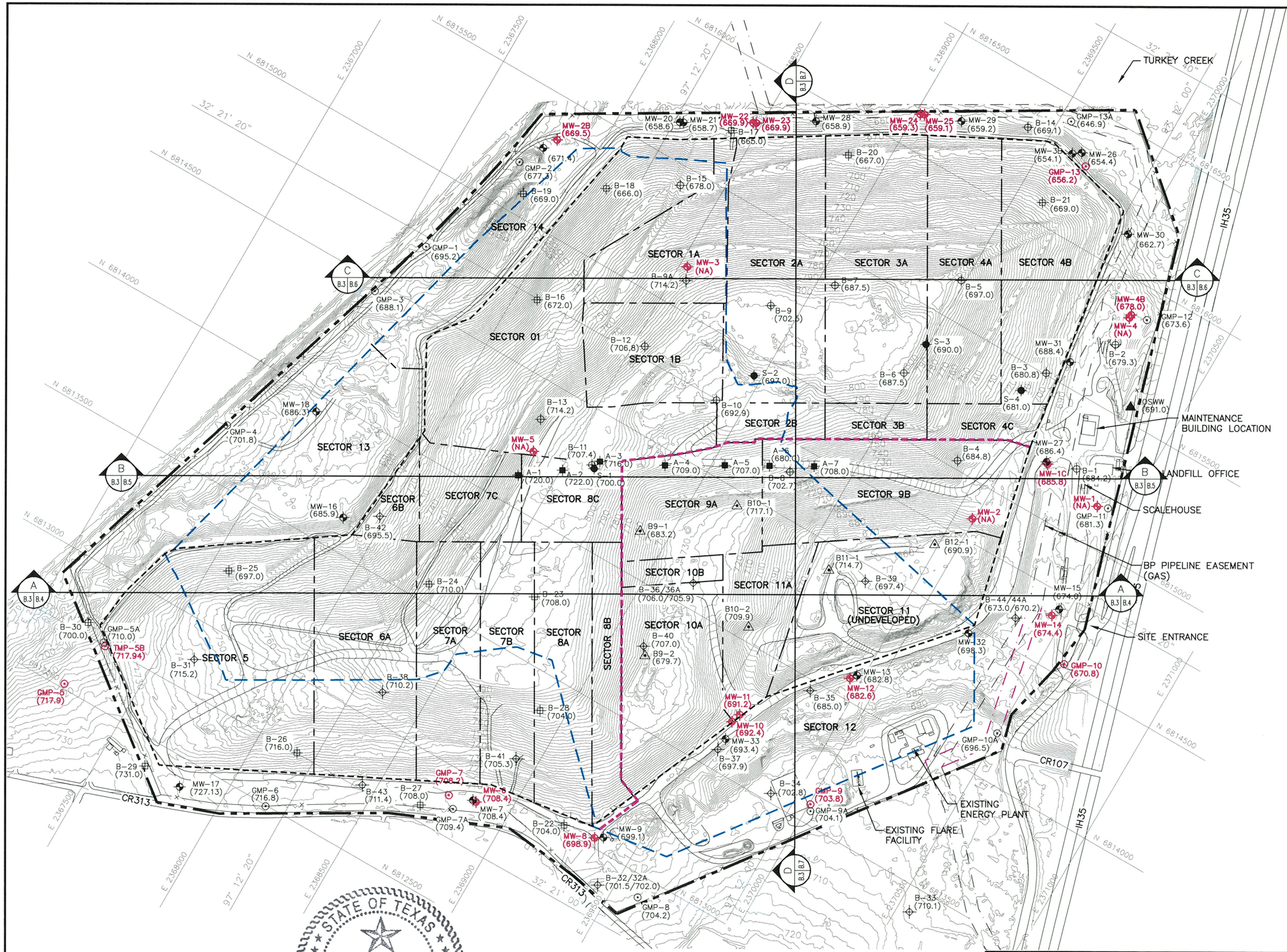
This document is intended for permitting purposes only.

CONTENTS

DRAWING B.1 – Typical Section Locations
DRAWING B.2 – Excavation Plan/Overliner Plan
DRAWING B.3 – Landfill Completion Plan
DRAWING B.4 – Typical Section A
DRAWING B.5 – Typical Section B
DRAWING B.6 – Typical Section C
DRAWING B.7 – Typical Section D



02/22/22



LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- 730 EXISTING CONTOUR
- N 6816000 STATE PLANE COORDINATE
- 32° 21' 20" GEODETIC COORDINATE
- EASEMENT
- PROPOSED RELOCATED EASEMENT
- CLASS 1 DISPOSAL AREA
- MW-7 (708.4) EXISTING GROUNDWATER MONITORING WELL
- GMP-12 (673.6) EXISTING GAS MONITORING PROBE
- B-1 (684.2) 1981 BAKER-SHIFLETT BORING
- S-1 (700.0) 1984 BAKER-SHIFLETT BORING
- B-16 (672.0) 1986 BAKER-SHIFLETT BORING
- A-1 (720.0) 1987 BAKER-SHIFLETT BORING
- B-31 (715.2) 1988-1991 BAKER-SHIFLETT BORING
- B9-1 (683.2) 2012 CAREL CORPORATION BORING
- MW-14 (674.4) FORMER GROUNDWATER MONITORING WELL
- GMP-10 (670.8) FORMER GAS MONITORING PROBE
- OSWW (691.0) EXISTING ONSITE WATERWELL

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. BOREHOLE LOCATION COORDINATES AND SURFACE ELEVATIONS OBTAINED FROM PREVIOUS SUBSURFACE EXPLORATION LITHOLOGIC LOGS AND REPORTS. REFER TO APPENDIX IIIG-GEOLOGY AND GEOTECHNICAL REPORT FOR MORE INFORMATION.
3. GROUND SURFACE ELEVATIONS AT THE TIME OF DRILLING POSTED AT EACH BOREHOLE LOCATION IN FT-MSL.

STATE OF TEXAS
NEVZAT TURAN
84059
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PROFESSIONAL ENGINEER

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FILE: 0771-368-11
CAD: B.1-TYP SECTION LOCATIONS.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: NT

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REVISIONS

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MAJOR PERMIT AMENDMENT
TYPICAL SECTION LOCATIONS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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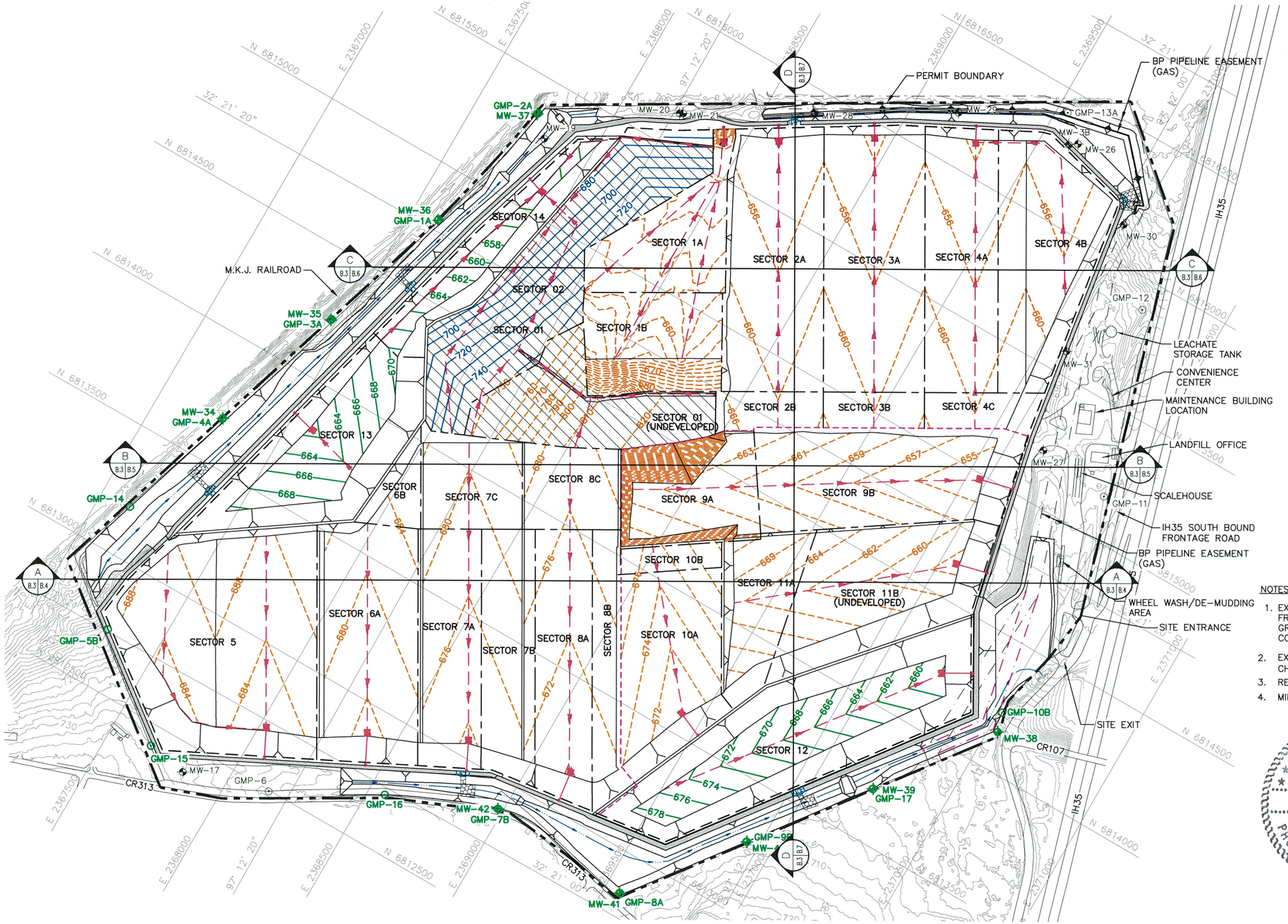

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. EXCAVATION SLOPES AND SLOPES OUTSIDE THE LIMIT OF WASTE (e.g., CHANNELS) ARE TYPICALLY 3H:1V.
3. REFER TO APPENDIX IIIC FOR LEACHATE STORAGE INFORMATION.
4. MINIMUM EXCAVATION ELEVATION AT LCS SUMP IS 648 FT-MSL.

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DATE: 02/2022
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CAD: B.2-EXCAVATION PLAN.DWG

DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: NT

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

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NO.	DATE	DESCRIPTION

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MAJOR PERMIT AMENDMENT
EXCAVATION PLAN/OVERLINER PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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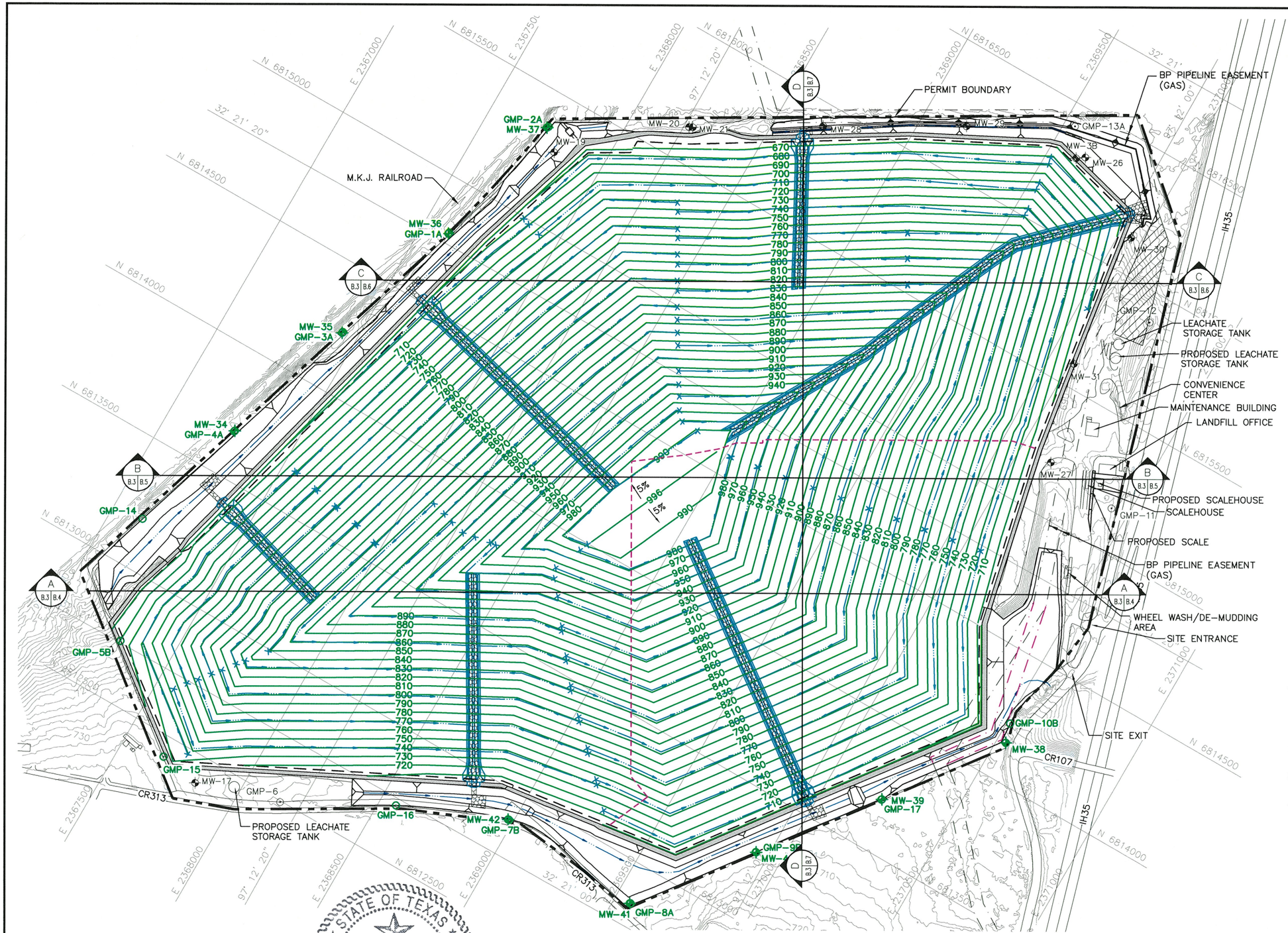

LEGEND

- PERMIT BOUNDARY
- LIMITS OF WASTE
- 750 — EXISTING CONTOUR
- N 6816000 — STATE PLANE COORDINATE
- 32° 21' 20" — GEODETIC COORDINATE
- EASEMENT
- PROPOSED RELOCATED EASEMENT
- 800 — FINAL COVER CONTOUR
- LIMIT OF CLASS 1 WASTE DISPOSAL AREA
- DRAINAGE LETDOWN
- DRAINAGE SWALE
- GABIONS
- MW-7 — EXISTING GROUNDWATER MONITORING WELL
- MW-38 — PROPOSED GROUNDWATER MONITORING WELL
- GMP-12 — EXISTING GAS MONITORING PROBE
- GMP-12 — PROPOSED GAS MONITORING PROBE
- FUTURE LFGTE FACILITY LOCATION

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON 01-08-2021. THE GRID SYSTEM IS TIED TO THE TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE NAD 1983.
2. REFER TO APPENDIX IIIF-SURFACE WATER DRAINAGE PLAN FOR DRAINAGE DESIGN INFORMATION.
3. MAXIMUM FINAL COVER ELEVATION IS 996.0 FT-MSL. MAXIMUM TOP OF WASTE ELEVATION IS 992.5 FT-MSL.
4. TYPICAL SIDESLOPES ARE 4H:1V IN THE CLASS I AREA AND 3.5H:1V IN THE MSW AREA, TYPICAL TOPSLOPE IS 6%.

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CAD: B.3-LANDFILL COMPLETION PLAN.DWG
DRAWN BY: JDW
DESIGN BY: CAM
REVIEWED BY: NT

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TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT LANDFILL COMPLETION PLAN

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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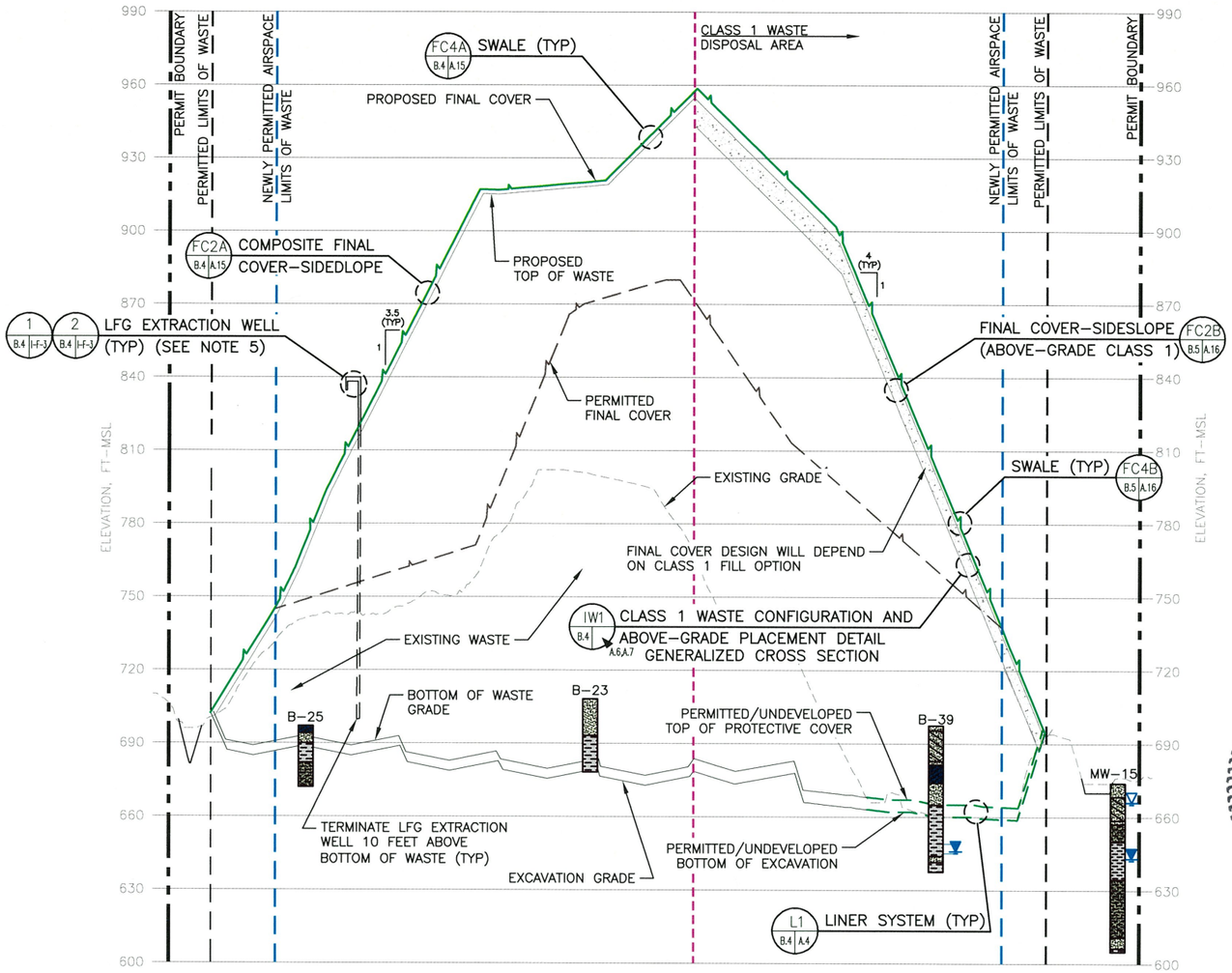

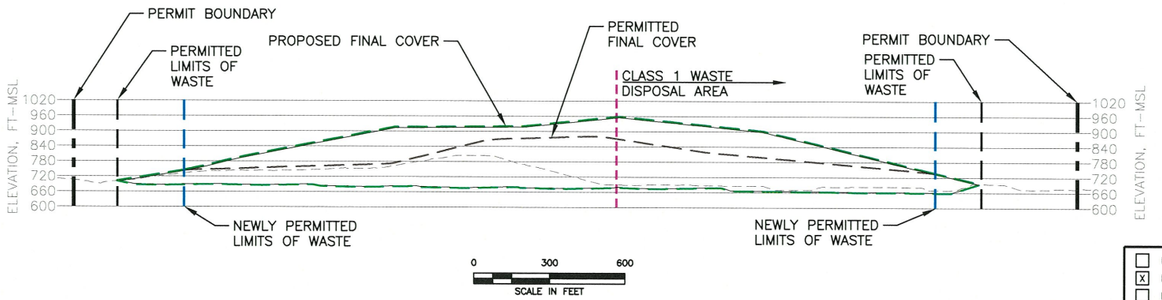

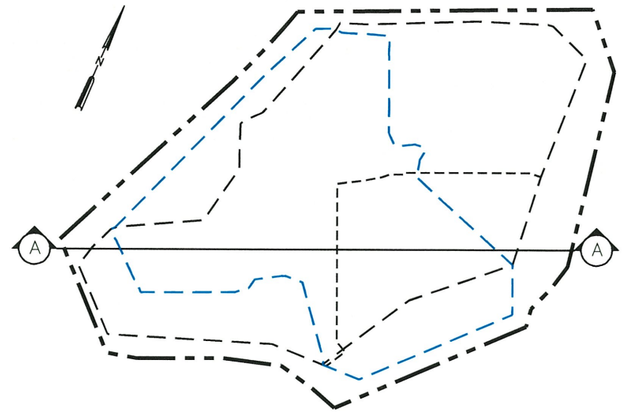

SECTION LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- LIMIT OF CLASS I WASTE DISPOSAL AREA
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- PERMITTED FINAL COVER
- STATIC GROUNDWATER ELEVATION (FT–MSL) FROM AUGUST 2010 GROUNDWATER MONITOR WELL GAUGING DATA
- GROUNWATER ELEVATION AT TIME OF DRILLING (FT–MSL)
- RANGE OF STATIC GROUNDWATER ELEVATION (FT–MSL) FROM GROUNDWATER PIEZOMETER GAUGING DATA
- SANDY CLAY
- CLAYEY SAND
- SANDSTONE
- SHALE or CLAYEY SHALE
- SAND
- SANDY SHALE

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER
02/22/22

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON JANUARY 8, 2021.
2. REFER TO APPENDIX IIIA–A FOR LINER, OVERLINER, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA, BORINGS PROJECTED INTO THE LINE OF THE SECTION. SEE DRAWING IIIB.1 FOR APPROXIMATE BORING LOCATIONS.
4. AS SHOWN IN APPENDIX I/IIC, THE BUFFER ZONES VARY AROUND THE PERIMETER OF THE SITE, BUT IN NO CASE ARE THEY LESS THAN 50–FEET. THE BUFFER ZONE BETWEEN THE PERMIT BOUNDARY AND NEWLY PERMITTED (PERMIT NO. MSW–1417D) WASTE DISPOSAL AIRSPACE IS AT LEAST 125 FEET.
5. REFER TO APPENDIX IIII FOR DETAILS OF THE LANDFILL GAS MANAGEMENT PLAN AND LOCATION OF TYPICAL LFG EXTRACTION WELLS.
6. DRAINAGE DESIGN INFORMATION IS PROVIDED IN APPENDIX IIIF–SURFACE WATER DRAINAGE PLAN.
7. MAXIMUM FINAL COVER ELEVATION IS 996 FT–MSL. DEEPEST EXCAVATION IS 648 FT–MSL.

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TEXAS REGIONAL LANDFILL COMPANY, LP

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MAJOR PERMIT AMENDMENT
TYPICAL SECTION A

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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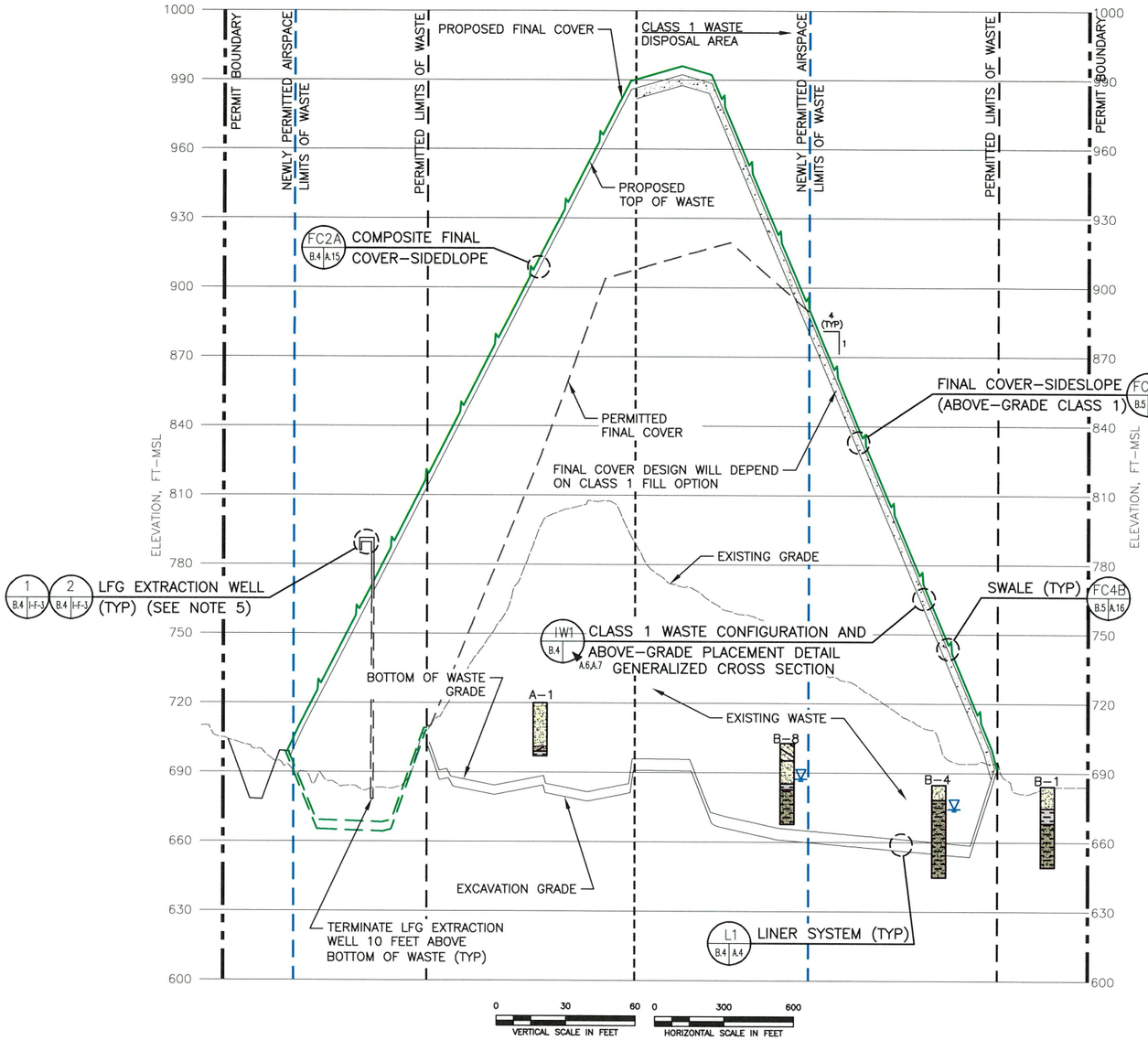

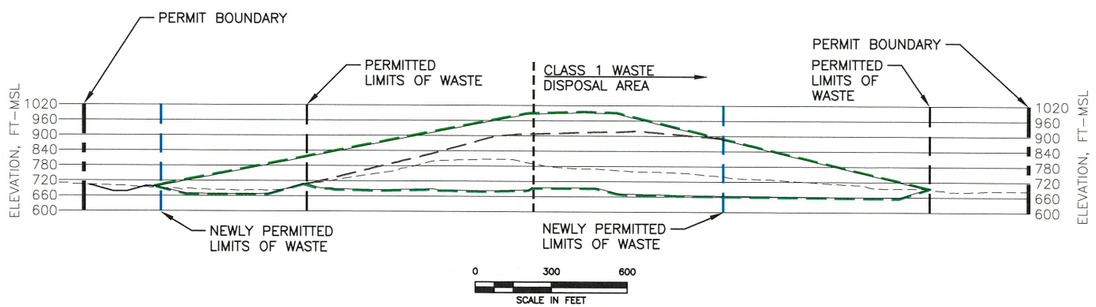

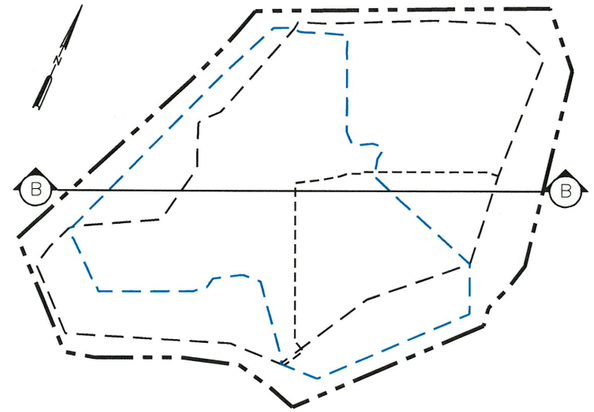

SECTION LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- LIMIT OF CLASS I WASTE DISPOSAL AREA
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- PERMITTED FINAL COVER
- STATIC GROUNDWATER ELEVATION (FT–MSL) FROM AUGUST 2010 GROUNDWATER MONITOR WELL GAUGING DATA
- GROUNWATER ELEVATION AT TIME OF DRILLING (FT–MSL)
- RANGE OF STATIC GROUNDWATER ELEVATION (FT–MSL) FROM GROUNDWATER PIEZOMETER GAUGING DATA
- SANDY CLAY
- CLAYEY SAND
- SANDSTONE
- SHALE or CLAYEY SHALE
- SAND
- SANDY SHALE

STATE OF TEXAS
NEVZAT TURAN
84059
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02/22/22

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON JANUARY 8, 2021.
2. REFER TO APPENDIX IIIA–A FOR LINER, OVERLINER, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA, BORINGS PROJECTED INTO THE LINE OF THE SECTION. SEE DRAWING IIIB.1 FOR APPROXIMATE BORING LOCATIONS.
4. AS SHOWN IN APPENDIX I/IIC, THE BUFFER ZONES VARY AROUND THE PERIMETER OF THE SITE, BUT IN NO CASE ARE THEY LESS THAN 50–FEET. THE BUFFER ZONE BETWEEN THE PERMIT BOUNDARY AND NEWLY PERMITTED (PERMIT NO. MSW–1417D) WASTE DISPOSAL AIRSPACE IS AT LEAST 125 FEET.
5. REFER TO APPENDIX IIII FOR DETAILS OF THE LANDFILL GAS MANAGEMENT PLAN AND LOCATION OF TYPICAL LFG EXTRACTION WELLS.
6. DRAINAGE DESIGN INFORMATION IS PROVIDED IN APPENDIX IIIF–SURFACE WATER DRAINAGE PLAN.
7. MAXIMUM FINAL COVER ELEVATION IS 996 FT–MSL. DEEPEST EXCAVATION IS 648 FT–MSL.

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PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

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MAJOR PERMIT AMENDMENT
TYPICAL SECTION B

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JOHNSON COUNTY, TEXAS

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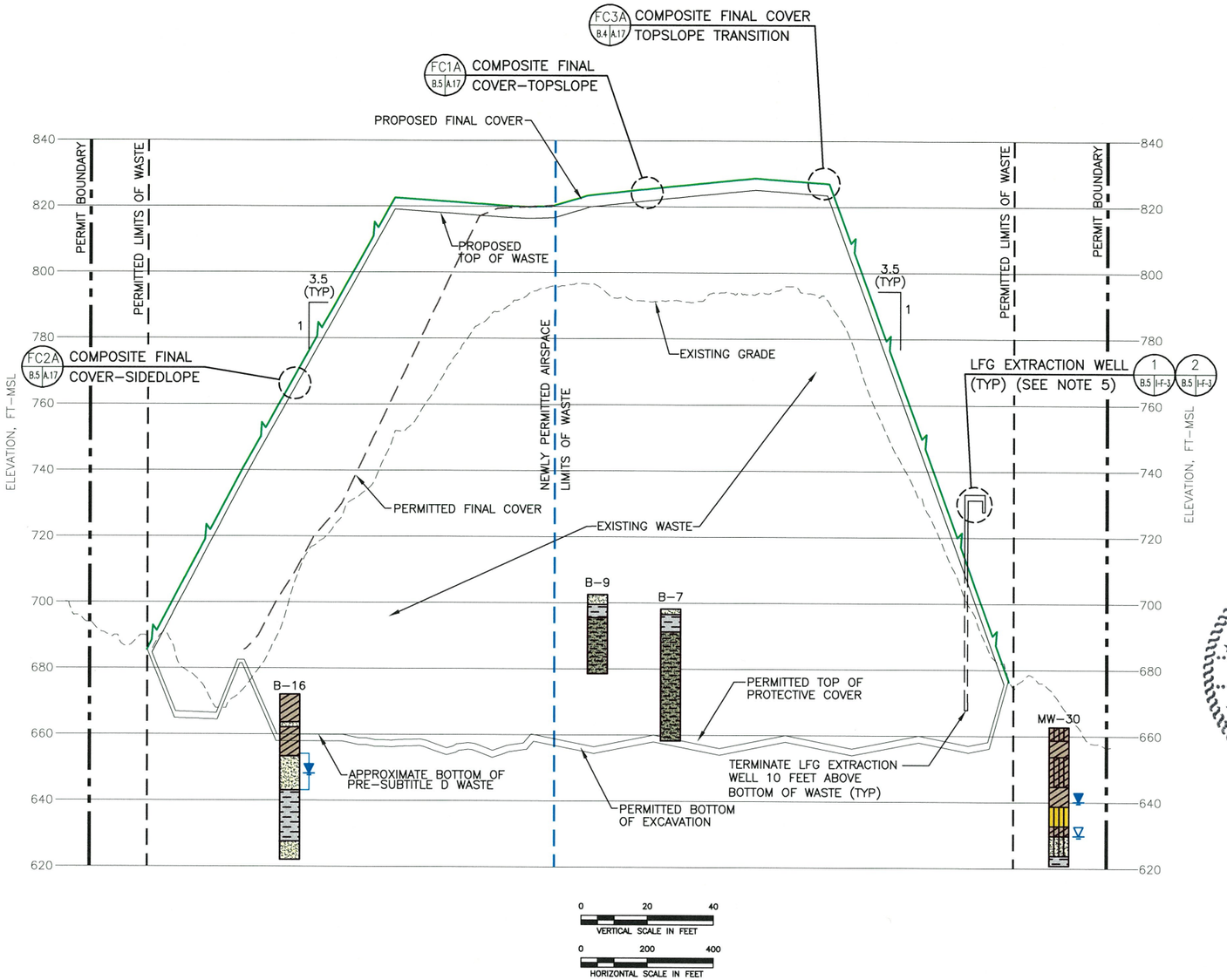

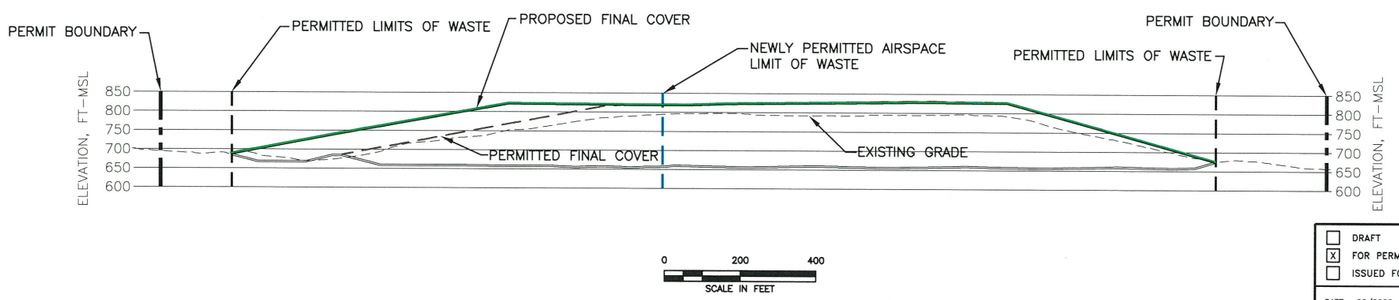

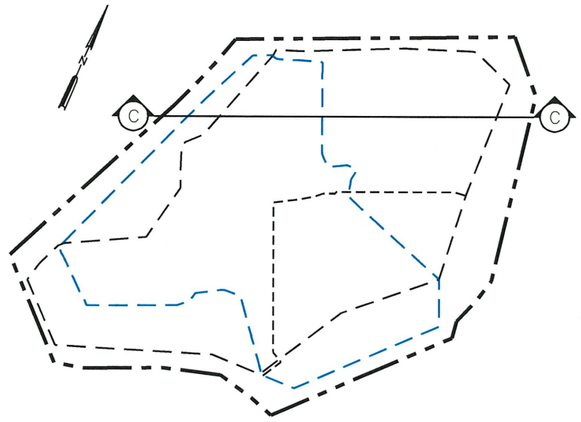

SECTION LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- PERMITTED/EXISTING FINAL COVER
- STATIC GROUNDWATER ELEVATION (FT–MSL) FROM AUGUST 2010 GROUNDWATER MONITOR WELL GAUGING DATA
- GROUNWATER ELEVATION AT TIME OF DRILLING (FT–MSL)
- RANGE OF STATIC GROUNDWATER ELEVATION (FT–MSL) FROM GROUNDWATER PIEZOMETER GAUGING DATA
- CLAY
- SHALE or CLAYEY SHALE
- SILTY CLAY
- SILTY SAND
- SAND
- SILT
- SANDSTONE
- SANDY SHALE



NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY DALLAS AERIAL SURVEYS FROM AERIAL PHOTOGRAPHY FLOWN ON JANUARY 8, 2021.
2. REFER TO APPENDIX IIIA–A FOR LINER, OVERLINER, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA, BORINGS PROJECTED INTO THE LINE OF THE SECTION. SEE DRAWING IIIB.1 FOR APPROXIMATE BORING LOCATIONS.
4. AS SHOWN IN APPENDIX I/IIC, THE BUFFER ZONES VARY AROUND THE PERIMETER OF THE SITE, BUT IN NO CASE ARE THEY LESS THAN 50–FEET. THE BUFFER ZONE BETWEEN THE PERMIT BOUNDARY AND NEWLY PERMITTED (PERMIT NO. MSW–1417D) WASTE DISPOSAL AIRSPACE IS AT LEAST 125 FEET.
5. REFER TO APPENDIX IIII FOR DETAILS OF THE LANDFILL GAS MANAGEMENT PLAN AND LOCATION OF TYPICAL LFG EXTRACTION WELLS.
6. DRAINAGE DESIGN INFORMATION IS PROVIDED IN APPENDIX IIIF–SURFACE WATER DRAINAGE PLAN.
7. MAXIMUM FINAL COVER ELEVATION IS 996 FT–MSL. DEEPEST EXCAVATION IS 648 FT–MSL.

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MAJOR PERMIT AMENDMENT
TYPICAL SECTION C

TURKEY CREEK LANDFILL
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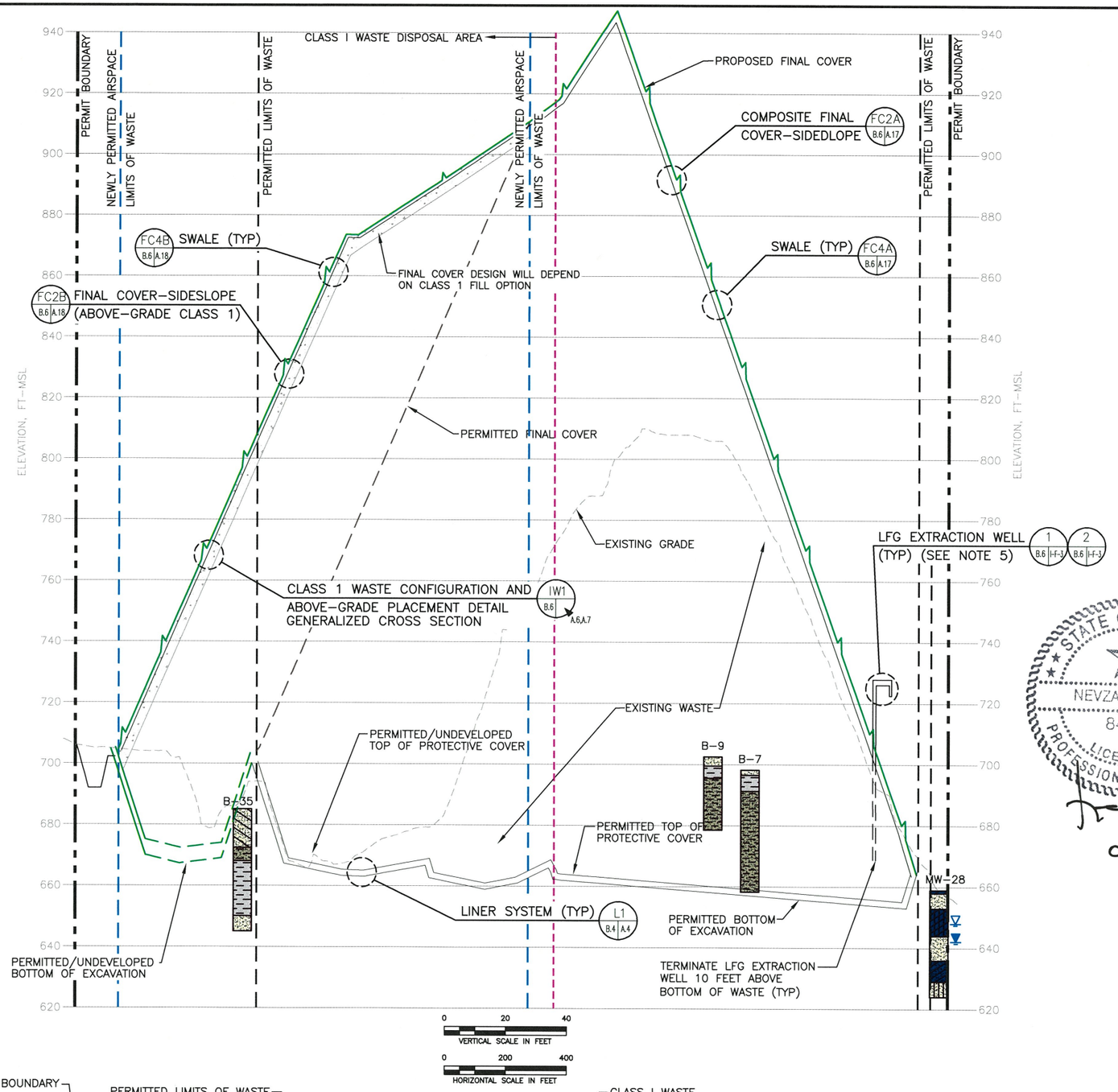

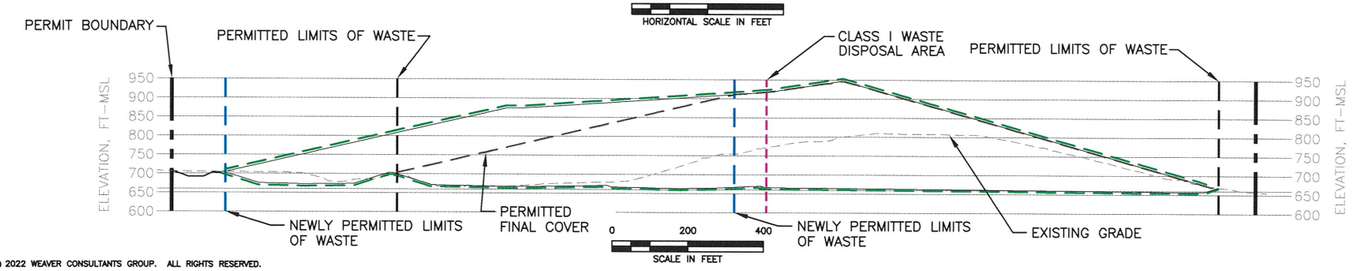

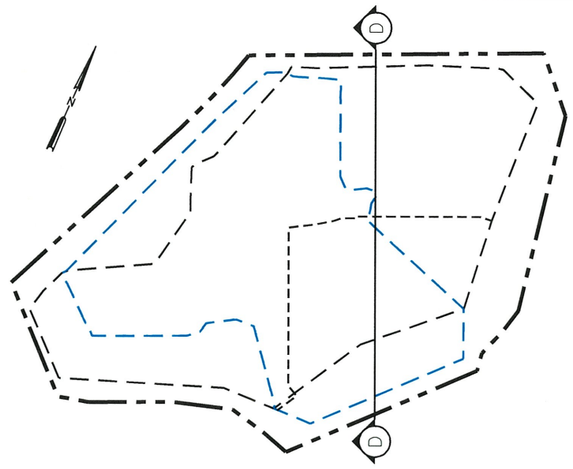

SECTION LOCATION MAP
NTS

LEGEND

- PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- NEWLY PERMITTED AIRSPACE LIMIT OF WASTE
- LIMIT OF CLASS I WASTE DISPOSAL AREA
- EXISTING GRADE
- TOP OF FINAL COVER
- TOP OF WASTE
- PERMITTED/EXISTING FINAL COVER
- STATIC GROUNDWATER ELEVATION (FT–MSL) FROM AUGUST 2010 GROUNDWATER MONITOR WELL GAUGING DATA
- GROUNWATER ELEVATION AT TIME OF DRILLING (FT–MSL)

CLAY | SILTY SAND | SANDSTONE | CLAYEY SAND
SHALE or CLAYEY SHALE | SAND | SANDY SHALE
SILTY CLAY | SILT | SANDY CLAY

STATE OF TEXAS
NEVZAT TURAN
84059
LICENSED
PROFESSIONAL ENGINEER
02/22/22

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY FIRMATEK FROM AERIAL PHOTOGRAPHY FLOWN ON JANUARY 8, 2021.
2. REFER TO APPENDIX IIIA–A FOR LINER, OVERLINER, AND FINAL COVER SYSTEM DETAILS.
3. SEE APPENDIX IIIG FOR BORING DATA, BORINGS PROJECTED INTO THE LINE OF THE SECTION. SEE DRAWING IIIB.1 FOR APPROXIMATE BORING LOCATIONS.
4. AS SHOWN IN APPENDIX I/IIC, THE BUFFER ZONES VARY AROUND THE PERIMETER OF THE SITE, BUT IN NO CASE ARE THEY LESS THAN 50–FEET. THE BUFFER ZONE BETWEEN THE PERMIT BOUNDARY AND NEWLY PERMITTED (PERMIT NO. MSW–1417D) WASTE DISPOSAL AIRSPACE IS AT LEAST 125 FEET.
5. REFER TO APPENDIX IIII FOR DETAILS OF THE LANDFILL GAS MANAGEMENT PLAN AND LOCATION OF TYPICAL LFG EXTRACTION WELLS.
6. DRAINAGE DESIGN INFORMATION IS PROVIDED IN APPENDIX IIIF–SURFACE WATER DRAINAGE PLAN.
7. MAXIMUM FINAL COVER ELEVATION IS 996 FT–MSL. DEEPEST EXCAVATION IS 648 FT–MSL.

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FILE: 0771–368–11
CAD: B.7–CROSS SECTION C.DWG
DRAWN BY: SRF
DESIGN BY: AKE
REVIEWED BY: NT

REVISIONS		
NO.	DATE	DESCRIPTION

Weaver Consultants Group
TBPE REGISTRATION NO. F–3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

MAJOR PERMIT AMENDMENT
TYPICAL SECTION D

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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DRAWING B.7

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TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW-1417D

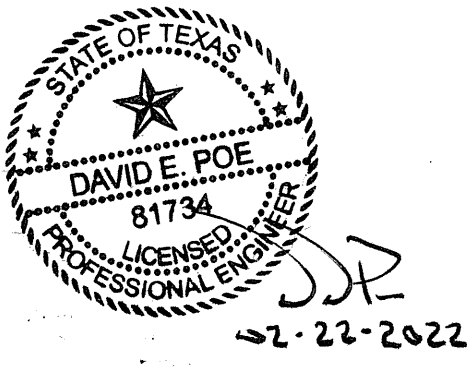
MAJOR PERMIT AMENDMENT APPLICATION

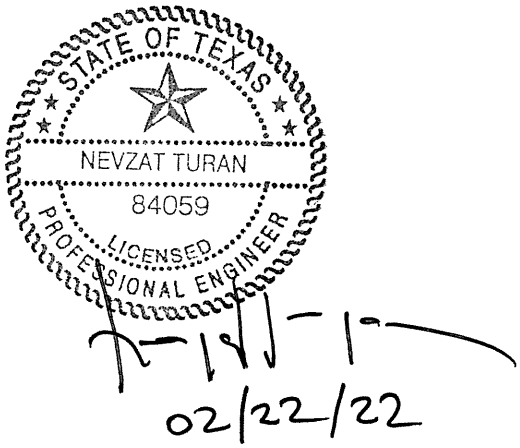
PART III – SITE DEVELOPMENT PLAN
APPENDIX IIIA-C
CLASS 1 WASTE ABOVE GRADE DISPOSAL OPTIONS

Prepared for

Texas Regional Landfill Company, LP

February 2022





Prepared by

Weaver Consultants Group, LLC
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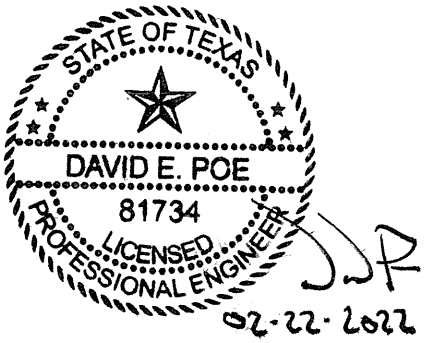

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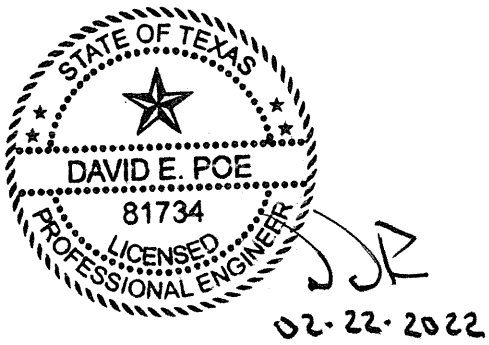


1 INTRODUCTION

1.1 Purpose

The purpose of this appendix is to provide the basis for the construction requirements for the above grade Class 1 Containment Dike and Soil Cover System options discussed in Appendix IIIA, Section 6.3. The containment dike construction requirements are summarized on Drawings A.10 through A.12 in Appendix IIIA-A and described in Section 6.3.2 in Appendix IIIA. The Soil Cover System requirements are summarized on the same drawings in Appendix IIIA-A and described in Section 6.3.2 in Appendix IIIA.

As discussed in Appendix IIIA, the construction techniques are designed to meet the requirements of Title 30 Texas Administrative Code (TAC) §335.590(24)(F)(i)(II) which states, "waste placed above grade shall be laterally contained by dikes that are constructed to be physically stable against slope failure, with a minimum safety factor of 1.5."

Three separate stability analyses were performed to demonstrate compliance with Title 30 TAC §335.590(24)(F)(i)(II). First, an analysis of the individual containment dike was performed. Secondly, a stability analysis for the entire Class 1 area sideslope with constructed containment dikes (with final cover) was completed to determine the factors of safety for the sideslope. These first two analyses are discussed in the following subsections and are presented in Appendix IIIA-C-1 and IIIA-C-2.

A third analysis was then performed of the Soil Cover System (with and without final cover), and is presented in Appendix IIIA-C-3. The placement of the Soil Cover System along the exterior of the sideslopes is demonstrated in Appendix IIIA-C-3 to be stable consistent with Title 30 TAC §335.590(24)(F)(i)(II).

1.2 Stability Model Information

SLIDE2 was used in the slope stability analyses. SLIDE2 is an industry standard computer program developed by RocScience, Inc. and is been used widely within the geotechnical field in slope and embankment stability applications for embankments, landfills, landslides and other earthen structures.

The input file for the SLIDE2 program includes:

a. Slope surface geometry.

b. Subsurface information to identify different types of soil materials in horizontal and vertical directions so that each subsurface segment is identified with corresponding soil strength parameters.

c. Material strength information. Each soil section (horizontal or vertical) identified in b. is assigned with strength parameters including cohesion and friction angle.

d. Model control and simulation user interface of the model that allows selection of the method of analysis (e.g., Simplified Bishop) and identifying simulation control parameters.

This program uses the method of slices in conjunction with the limit equilibrium procedure to calculate the factor of safety for a slope. The generalized equilibrium method that is used by this program allows factors of safety to be calculated for force and moment equilibrium or force equilibrium only. This program utilizes a two-dimensional analysis that calculates vertical and horizontal stresses. In general, the critical slopes for the analysis are determined using the longest and steepest section for the analyzed landfill configuration. The program allows searching for the most critical circular, noncircular or block shaped surface or allows analysis of a single circular or noncircular failure surface.

The two methods employed for this slope stability analysis are described below.

1. Simplified Janbu Method – This method uses the method of slices to determine the stability of the mass above a failure surface. The Simplified Janbu method is based on the assumption that the interslice forces are only horizontal. In other words, Simplified Janbu method satisfies vertical force equilibrium for each slice, as well as the overall horizontal force equilibrium for the entire slide mass (i.e., all slices).

2. Simplified Bishop Method – This method uses the method of slices to discretize the soil mass for determining the factor of safety. This method satisfies vertical force equilibrium for each slice and overall moment equilibrium about the center of the circular trial surface.

2 CONTAINMENT DIKE STABILITY ANALYSIS

This stability analysis focuses on the stability of the individual containment dikes with 4H:1V exterior slopes and 2H:1V interior slopes, and is included in Appendix IIIA-C-1. As shown on Figure IIIA-C-1-4 in Appendix IIIA-C-1, the following condition was analyzed.

- Containment Dike at Construction. For this condition the containment dike is assumed to have one set of shear strength parameters, as it represents the condition after construction. Any future minor influence of vegetation or surface wetting of the embankment was considered minimal, and was not considered for this analysis.

This slope stability demonstration utilizes soil strength parameters of C'=100 psf and $\phi'=16^{o}$ for effective stress, and C=250 psf and $\phi=0°$ for total stress analyses. These parameters conservatively represent clay-rich soils that are compacted to a minimum of 95 percent of the maximum dry density as determined by Standard Proctor (ASTM D 698) and will be verified for each soil type used for containment dike construction (refer to Section 6.4.1 of Appendix IIIA for more information).

Table 2-1
Dike Strength Parameters

Condition 2 Description	Effective Stress Strength Parameters		Total Stress Strength Parameters	
	C'	ϕ'	C	ϕ
Containment Dike Constructed of Clay-rich Soils Compacted to a Minimum of 95% of the Maximum Dry Density as Determined by Standard Proctor	100 psf	16°	250 psf	0°

The results of the stability analysis are summarized in Table 2-2. As shown in Table 2-2, in each case the calculated factor of safety for the permanent outer slope (4H:1V) is above the minimum factor of safety of the 1.5 value listed in Title 30 TAC §335.590(24)(F)(i)(II). The inner slope (2H:1V) has calculated factors of safety that exceed 1.3, which is acceptable considering (1) the exposed 2H:1V slope is a very short-term condition, and (2) the interior slopes will be buttressed with Class 1 waste during the initial placement of Class 1 waste in the cell, eliminating the exposed 2H:1V slope and the potential for movement of this interior slope.

Table 2-2
Summary of Dike Slope Stability Analyses Results[1]

Slope Designation	Method of Analysis	Minimum Factor of Safety Generated		Recommended Minimum Factor of Safety	Acceptable Factor of Safety
		At Construction			
		Total Stress	Effective Stress		
4H:1V Outer Slope	Bishop-Circular	2.14	2.43	1.5	YES
2H:1V Inner Slope[2]	Bishop-Circular	1.45	1.49	1.3	YES

1. Table presents results for outer (exterior) and inner (interior) slopes of containment dike only.
2. Inner slope stability results represent short term conditions, as filling against dike slope will buttress inner slope as Class 1 waste filling proceeds vertically.

In addition, an infinite slope stability analysis was performed for a 6-inch-thick vegetative layer placed on the exterior of the containment dike and is included in Appendix IIIA-C-4. As shown in this appendix, the calculated factors of safety for the vegetative layer, (as well as the final cover condition) are above the minimum required factor of safety of 1.5 for long term stability. Short term stability values for the inner slope exceed the prescribed value of 1.3.

3 ABOVE GRADE CLASS 1 CONTAINMENT DIKES WASTE STABILITY

3.1 General

This stability analysis focuses on the stability of the entire sideslope of the containment dike area. The configurations of containment dike placement are shown on Drawings A.8 through A.10 in Appendix IIIA-A. The stability analysis was performed for a built-out condition which assumes the containment dikes are constructed vertically the entire sideslope of the landfill, as discussed in the following sections. Stability of the individual containment dikes is presented in Section 2, above.

Note that stability analysis of 3H:1V internal (interim) waste slopes is presented in Appendix IIIM, and has not been reproduced for this analysis. As shown in Appendix IIIM, interim slopes were demonstrated to be stable with fill heights not exceeding 200 feet.

3.2 Slope Stability Analysis

3.2.1 Configuration Analyzed

The following configuration was analyzed in the slope stability analysis included in Appendix IIIA-C-2.

- Containment Dikes and final cover constructed to approximate elevation 980 ft-msl (approximate landfill crest) – Figure IIIA-C-2-4 in Appendix IIIA-C-2 shows the containment dike and 5-foot-thick final cover (4-feet of compacted infiltration layer clay and 1 foot of protective/erosion layer) over the exterior slope of the containment dike.

The configuration shown was developed as a typical slope for Class 1 containment dikes with final cover and assumed as representative of the most critical slopes. The section location for the configuration represents an estimate of the longest slopes in the Class 1 disposal area (from the toe of slope to the crest of the landfill). The longest slopes were analyzed because they represent the configuration that provides the greatest load for the active wedge that acts against the slope. The most critical containment dike configuration is analyzed for the Class 1 waste disposal area.

3.2.2 Input Parameters

The input parameters for the various landfill materials are discussed in detail in Appendix IIIA. The containment dike strength parameters used for this analysis are the same as those discussed in Section 2.0. The closed condition slopes were analyzed assuming one set of shear strength parameters for the dike. The clay liner, protective cover, final cover, intermediate cover, and subsurface material strength parameters are consistent with those presented in Appendix IIIM – Geotechnical Report. The waste strength parameters were conservatively selected for all Class 1 waste types accepted (including solidified sludge and other solidified liquid waste).

3.2.3 Results

The results of the slope stability analyses included in Appendix IIIA-C-2 are presented in Table 3-1. As shown, in each case the calculated factor of safety is above the required factor of safety of 1.5 for long-term (effective) conditions as listed in Title 30 TAC §335.590(24)(F)(i)(II). Additionally, the slope stability analyses demonstrate that the short-term stability factor of safety exceeds 1.3 for the interior (inner) 2H:1V slopes for the Class 1 containment dike option.

Table 3-1
Summary of Slope Stability Analyses – Containment Dikes[1]

Slope Designation	Method of Analysis	Minimum Factor of Safety Generated		Recommended Minimum Factor of Safety	Acceptable Factor of Safety
		Total Stress	Effective Stress		
Containment Dikes Constructed to Crest Elevation 980 ft-msl					
Dike Build-out Condition (Waste Density = 100 pcf)	Bishop-Circular	1.59	1.84	1.5	YES
	Rankine-Block	1.67	1.67	1.5	YES
Containment Dikes Constructed to Elevation 980 ft-msl, Final Cover Installed					
Dike Final Closure Condition (with Final Cover) (Waste Density = 100 pcf)	Bishop-Circular	1.87	1.83	1.5	YES
	Rankine-Block	1.67	1.67	1.5	YES

1. Table represents results for final buildout of Class 1 slopes constructed with above grade containment dikes, before and after final cover installation.

4 ABOVE GRADE OPTION SOIL COVER SYSTEM STABILITY

A slope stability analysis has been performed to evaluate the stability of critical sections of the 4(H):1(V) exterior sideslope of the Class 1 waste fill area with a Soil Cover System. The slope stability analyses are included in Appendix IIIA-C-3. The results of the slope stability analysis are summarized in Table 4-1.

Strength parameters for subsurface soils, material properties for the landfill components (e.g., final cover, containment dike, and liner material), and material properties for waste were selected based on previous analyses completed for the site.

The Simplified Bishop method has been used for the rotational (circular) slope stability analysis for effective stress conditions. The use of effective stress (long-term) conditions for the Soil Cover System analysis was considered appropriate in light of stability analyses also having been completed for both total and effective stress for the thicker containment dike option as presented in Appendix IIIA-C-2.

Stability analyses were performed using the SLIDE2 computer program. The critical section location was selected to analyze the longest and steepest slopes. Interim (prior to final cover placement) and final (maximum) slopes (after final cover placement) were analyzed with 4(H):1(V) exterior sideslopes for the Class 1 waste fill area. Figures showing the location of the landfill cross section and corresponding analysis cross sections are included in Appendix IIIA-C-3.

The results of the stability analyses indicate that the proposed slopes are stable under the conditions analyzed. Table 4-1 summarizes the results of the stability analyses for the slopes and compares the calculated factor of safety to the recommended minimum factor of safety. The recommended minimum factor of safety for the conditions analyzed was established based on the requirements of Title 30 TAC 335.590(24)(F)(i)(II), which states that dikes must "be physically stable against slope failure, with a minimum factor of 1.5."

Loading Conditions	Recommended Minimum Factor of Safety
Long-Term	1.5

Computer-generated slope stability analysis output is included in Appendix IIIA-C-3. As shown in Table 4.1, the calculated factors of safety for the slopes is above the recommended factor of safety.

Table 4-1
Summary of Slope Stability Analyses – Soil Cover System

Analyzed Section Recommended Minimum Factor of Safety = 1.5	Calculated Factor of Safety (Effective Stress)		Factor of Safety Acceptable
	Bishop-Circular	Rankine-Block	
Interim Condition – 4-ft Thick Soil Cover Installed			
Constructed 4-ft Thick Soil Cover System (Waste Density = 100 pcf)	1.84	1.67	YES
Final Condition – 6-ft Thick Final Cover Installed			
Soil Cover System with 6-ft-thick Final Cover (Waste Density = 100 pcf)	1.85	1.68	YES
Final Condition – Constructed Final Cover Veneer Stability			
Analysis Section	**Effective**	**Total**	
• Infinite Analysis Vegetative Layer (Dikes and Final Cover)	14.3	6.4	YES
• Infinite Analysis (Erosion Layer/Geocomposite Interface)	2.37		YES
• Infinite Analysis (Geocomposite/Textured Geomembrane Interface)	2.49		YES
• Infinite Analysis (Textured Geomembrane/Clay Infiltration Layer Interface)	3.98		YES

5 SETTLEMENT ANALYSIS

A settlement analysis was performed to ensure that no adverse impacts will occur for the above-grade Class 1 waste options due to differential settlement of the final cover system.

The settlement analysis was performed to determine the amount of differential settlement for the 4H:1V sideslopes that is considered conservatively representative of both the containment dike final cover and the Soil Cover System final cover installed. The purpose of this settlement analysis is to ensure that the expected strain due to differential settlement is within acceptable limits for the final cover components and containment dike soils. The analysis is included in Appendix IIIA-C-5 and summarized in Table 5-1.

Settlement analysis was performed for both sideslope and topslope, as this area would be subject to the greatest settlement differential due to the differences in waste thickness between the toe and crest of the landfill. Differential settlement on the topslope is anticipated to be much less than on the sideslopes, due to the limited area of sideslope, and the generally consistent depth of waste below the topslope covers. Containment dikes will not be constructed on the topslope, and therefore post-waste placement loading was limited to the 6-foot-thick Soil Cover System option final cover. Additional demonstration that the final cover will not undergo damaging strain is presented in Appendix IIIM of this application.

For the analysis a worst-case scenario was developed that could be assumed representative of both the containment dike and Soil Cover System options. For this analysis, a containment dike/final cover that is 20-foot-thick (which includes both the 5-foot thick containment dikes final cover as well as an additional 15 feet of soil placed to construct the sideslope containment dikes) was assumed.

Additionally, an analysis was performed to confirm that the projected settlement that will occur during the postclosure period would not create excessive differential settlement around the Class 1 disposal area. This analysis included analyzing the settlement of the sideslope of the landfill for the 30-year period after closure. The calculated strain on the final cover system components shows that the projected strain due to differential settlement is within the tolerance of each of the final cover system components.

Table 5-1
Strain Evaluation Results

Item	Component	Allowable Tensile Strain[1]	Maximum Calculated Strain	Strain Within Acceptable Limits
Class 1 Sideslope (closed)	Final Cover Compacted Clay	0.5%	0.313%	YES
	LDPE Geomembrane	8 – 12%		
	Geonet	200%		
	Geotextile	20%		
Containment Dike	Compacted Clay-Rich Soil	0.5%	0.313%	YES

[1] Only tensile strain (pulling) is presented as critical in the above table. The negative strain values shown in the table on Page IIIA-C-4-12 represent compression not tensile strain, and are considered acceptable for all conditions. The highest tensile strain value in the table on page IIIA-C-4-12 is listed above.

6 SUMMARY

As demonstrated in Appendix IIIA-C-1, the (individual) containment dike configuration results in a factor of safety greater than 1.5 for the long term (effective stress) conditions. The short-term factors of safety for the inner (2H:1V) slope exceed 1.3, which is considered acceptable considering (1) the exposed 2H:1V slope is a very short term condition, and (2) the interior dike slopes will be buttressed with Class 1 waste during the initial placement of Class 1 waste in the cell, eliminating the exposed 2H:1V slope and the potential for movement of this inner slope.

The placement of containment dikes along the exterior sideslopes is demonstrated in Appendix IIIA-C-2 to be stable with factors of safety greater than 1.5, consistent with Title 30 TAC §335.590(24)(F)(i)(II). The Soil Cover System option configuration also results in a factor of safety greater than 1.5 for the long-term condition (effective stress). The placement of the Soil Cover System along the exterior of the sideslopes is demonstrated in Appendix IIIA-C-3 to be stable consistent with Title 30 TAC 335.590(24)(F)(i)(II).

As discussed in Section 1.2, the SLIDE2 model accounts for lateral forces that are acting on the interior slope of the containment dike (i.e., driving forces that are caused by the waste that is placed behind the containment dike). In addition, the model also calculates the resisting force that is created by the configuration of the containment dike, along with the containment dike's shear strength parameters (i.e., cohesion, friction angle, and unit weight).

If the containment dike option and Soil Cover System option resisting forces are greater than the lateral (or driving) forces, then the slope is considered stable. The factor of safety is calculated by dividing the resisting forces by the driving forces. A factor of safety of 1.5 is required for the long term conditions. The analyses demonstrate that the options analyzed provide a long term factor of safety of 1.5 or greater. Therefore, the containment dikes and Soil Cover System are designed to be stable consistent with Title 30 TAC §335.590(24)(F)(i)(II), and to minimize long-term maintenance, as required by §335.590(24)(F)(i)(VI).

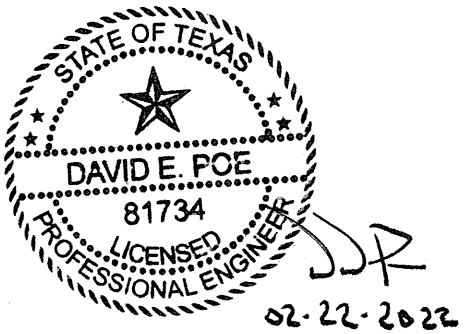
Veneer stability analysis conducted for containment dike vegetation layer and final cover components are included in IIIA-C-4, and demonstrate that veneer stability factors of safety exceed 1.5.

Strain analysis conducted of the containment dike option and Final Cover System option (based on analysis of a worst-case scenario representative of both options) demonstrates that strain introduced in the soil sideslope containment dikes and the final closure system components is within acceptable limits.

APPENDIX IIIA-C-1

CLASS 1 SIDESLOPE CONTAINMENT DIKE SLOPE STABILITY ANALYSIS (INDIVIDUAL)

Includes pages IIIA-C-1-1 through IIIA-C-1-24



Purpose: The purpose of this analysis is to demonstrate that the construction technique for the individual dikes as specified in Appendix IIIA will result in a containment dike that will be physically stable against slope failure with a minimum long-term factor of safety of 1.5. For short-term conditions a minimum factor of safety of 1.3 is acceptable.

Method: The containment dike stability analysis has been completed using SLIDE2, a computer program developed to model general slope stability. Circular failure surfaces using the Simplified Bishop method have been generated to analyze the slopes for the configuration given below.

- Individual Containment Dike - 4H:1V outer (exterior) slopes.
- Individual Containment Dike - 2H:1V inner (interior) slopes.

The containment dike configurations is shown on Sheet IIIA-C-1-4. SLIDE output is presented on pages IIIA-C-1-5 through IIIA-C-1-24.

Procedure:

1. Input containment dike configuration.
2. Select strength parameters.
3. Perform analysis to calculate factor of safety.

References:

1. Duncan, J. Michael and Stephen G. Wright., *Soil Strength and Slope Stability*, John Wiley & Sons, Inc. Hoboken, NJ, 2005
2. Terzaghi, Karl, Peck, Ralph B., and Mesri, Gholamreza, *Soil Mechanics in Engineering Practice, Third Ed.*, John Wiley & Sons, Inc. New York, NY, 1996
3. Day, Robert W., *Geotechnical Engineer's Portable Handbook*, McGraw-Hill Companies, Inc. New York, NY, 2000
4. Abramson, Lee W., Lee, Thomas S., Sharma, Sunil, Boyce, Glenn M., *Slope Stability and Stabilization Methods, 2nd Ed.*, John Wiley & Sons, Inc., New York.
5. SLIDE2 (computer program for slope stability analyses), Rocscience Inc.

1. Input Containment Dike Configuration

The proposed containment dike configuration is shown on Sheet IIIA-C-1-4. As shown, the containment dike has 4H:1V outer (exterior) slopes and 2H:1V inner (interior) slopes and a 4-foot top width. The dike is 12 feet in height at initial construction, and 10-feet in height after construction of subsequent dikes.

The following condition was analyzed.

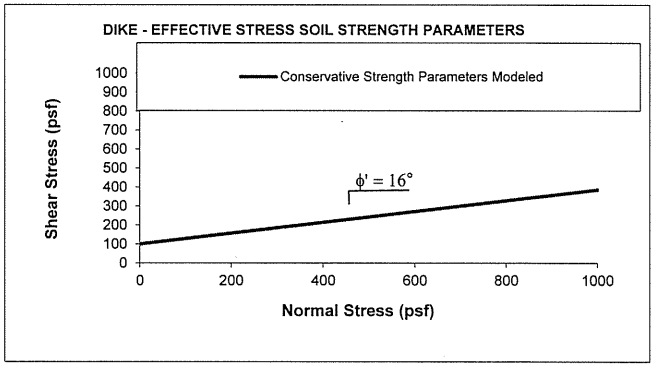
- Containment Dike at Construction. For this configuration the containment dike is assumed to have one set of shear strength parameters, as it represents the condition after construction and before vegetation is established.

2. Select Strength Parameters

The slope stability analysis has been developed for both total and effective stress conditions to address short and long term conditions, respectively, that will exist after the installation of the dikes. A total stress analysis is applicable to the rapid construction of a slope or a condition where the slope is loaded quickly and utilizes undrained shear strength values (Ref. 3). An effective stress analysis is used to model the long-term condition of the slope, and the analysis uses pore water pressures and drained shear strength values (Ref. 3). The selected strength parameters for this analysis are listed in the table and graph shown below. Note that the waste only exhibits effective stress strength (i.e., no pore water pressures will build up within waste). Therefore, the total strength analysis is only applicable to the fine-grained containment dike soils.

EFFECTIVE STRESS SOIL PROPERTIES

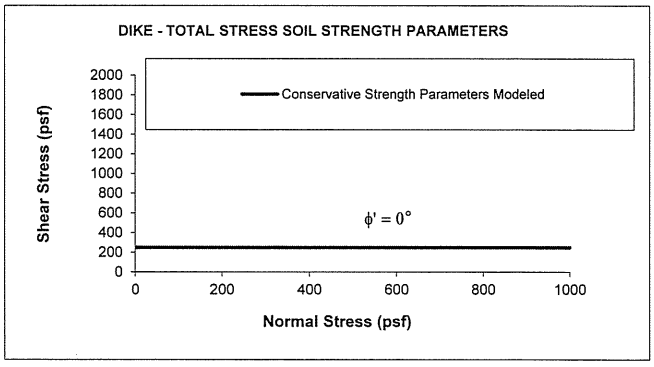
Unit	Unit Weight*		Cohesion Intercept	Internal Friction Angle
	Moist (pcf)	Saturated (pcf)	(psf)	(deg)
Dike	116	120	100	16
Waste	100	100	288	23



TOTAL STRESS SOIL PROPERTIES

Unit	Unit Weight*		Cohesion Intercept	Internal Friction Angle
	Moist (pcf)	Saturated (pcf)	(psf)	(deg)
Dike	116	120	250	0
Waste	100	100	288	23

*Moist (or total) unit weight is defined as the total mass of the soil per total volume of the soil sample. The saturated unit weight represents the condition where all the void spaces are filled with water.



As noted above, the slope stability demonstration included in this appendix utilizes containment dike soil strength parameters of C'=100 psf and $\phi'=16^{o}$ for effective stress, and C=250 psf and $\phi=0^{o}$ for the total stress analysis. These parameters were conservatively selected based on (1) WCG's experience with compacted soils placed with limited construction oversight and (2) various reference sources.

For compacted clay, Ref. 3 lists shear strength values of 25° to 30° and occasionally as high as 35° for ϕ'. Ref. 3 also lists strength parameters of C=172.8 psf and ϕ=29° for a compacted silty clay material. Based on WCG's experience, these values for strength parameters are also typical for the range of soils present at the Turkey Creek Landfill. Therefore, the selected strength parameters for the containment dikes are conservative and will be achieved through the construction techniques included in Appendix IIIA. As noted in Section 6.3 of Appendix IIIA, the total and effective strength parameters will be verified for each soil type used for containment dike construction by the Texas licensed professional engineer that will sign the certification form that will be completed for each containment dike construction event, per Title 30 TAC §335.590(24)(F)(vi).

3. Perform Analysis to Calculate Factor of Safety

The calculated factors of safety are shown below and summarized on Sheet IIIA-C-1-4. The outer (exterior) slope factors of safety, using conservatively selected strength parameters, are above 1.5 for both short and long term conditions (total and effective stress). The inner (interior) 2H:1V slopes have calculated factors of safety above 1.4 for both short and long term stability. The target minimum factor of safety for the inner (interior) 2H:1V dike slopes is 1.3, as these slopes will be buttressed by waste placed against the dike slope during initial Class 1 waste placement in the respective cell, and not subject to long-term slope failure. Therefore, the proposed design meets 30 TAC §335.590(24)(F)(i)(II) which requires the containment dike to "be physically stable against slope failure, with a minimum safety factor of 1.5."

Table 1-1 shows the summary of the results and recommended minimum safety factors for outer and inner slopes. All the values met the recommended safety factors.

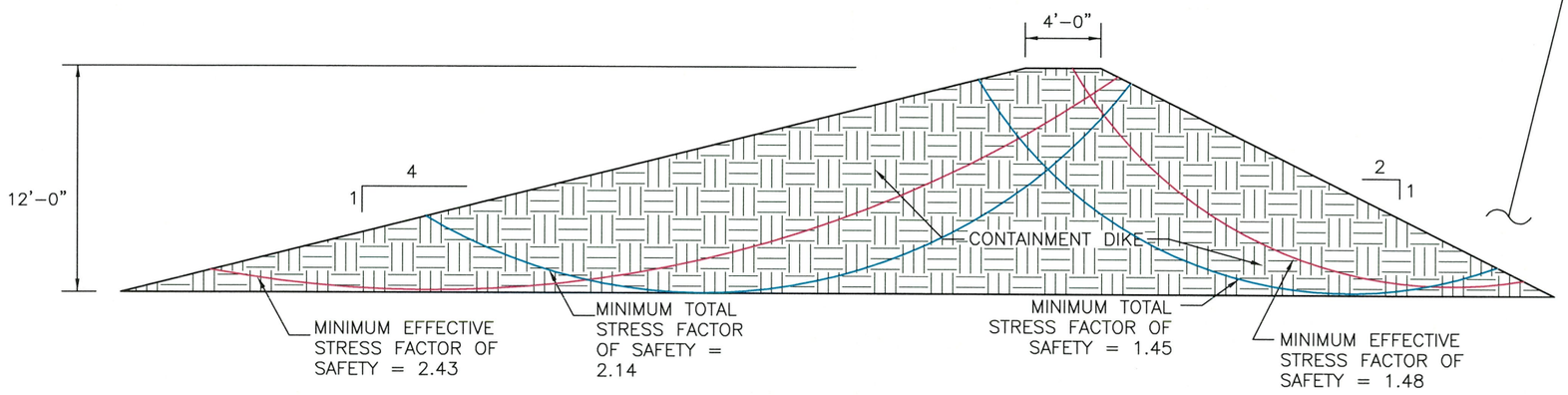
Table 1-1
Individual Containment Dike Slope Stability Analysis Results

Slope Designation	Method of Analysis	At Construction Minimum Factor of Safety Generated		Recommended Minimum Factor of Safety	Acceptable Factor of Safety
		Total Stress	Effective Stress		
4H:1V Outer Slope	Bishop-Circular	2.14	2.43	1.5	YES
2H:1V Inner Slope	Bishop-Circular	1.45	1.48	1.3[1]	YES

[1]The target minimum factor of safety for the inner (interior) 2H:1V dike slopes is 1.3, as these slopes will be buttressed by waste placed against the dike slope during initial Class 1 waste placement in the respective cell, and not subject to long-term slope failure.

CONTAINMENT DIKE STRENGTH PARAMETER SUMMARY

ITEM	EFFECTIVE STRESS STRENGTH PARAMETER		TOTAL STRESS STRENGTH PARAMETERS	
	C'	ø'	C	ø
CONTAINMENT DIKE CONSTRUCTED OF CLAY-RICH SOILS COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY DETERMINED BY STANDARD PROCTOR	100 psf	16°	250 psf	0°



NOTE THAT CLASS 1 WASTE OR CLASS 1 WASTE MIXED WITH OTHER ACCEPTED WASTE WILL NOT BE PLACED UNTIL THE CONTAINMENT DIKE HAS BEEN CERTIFIED BY A PROFESSIONAL ENGINEER CONSISTENT WITH §335.590(24)(F)(vi). HOWEVER, ONCE WASTE IS PLACED AGAINST THE CONTAINMENT DIKE THE WASTE WILL BUTTRESS THE CONTAINMENT DIKE WHICH WILL INCREASE THE STABILITY OF THE CONTAINMENT DIKE.

CLASS 1 WASTE DISPOSAL AREA

CONTAINMENT DIKE-AT CONSTRUCTION

0 5 10
SCALE IN FEET

STATE OF TEXAS
DAVID E. POE
81734
LICENSED PROFESSIONAL ENGINEER
02-22-2022

☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 02/2022
FILE: 0771-368-11
CAD: SHEET IIIA-C-1-4.DWG

DRAWN BY: JDW
DESIGN BY: MDM/RCE
REVIEWED BY: DEP

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
BASE CONTAINMENT
DIKE CONFIGURATION

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

SHEET IIIA-C-1-4

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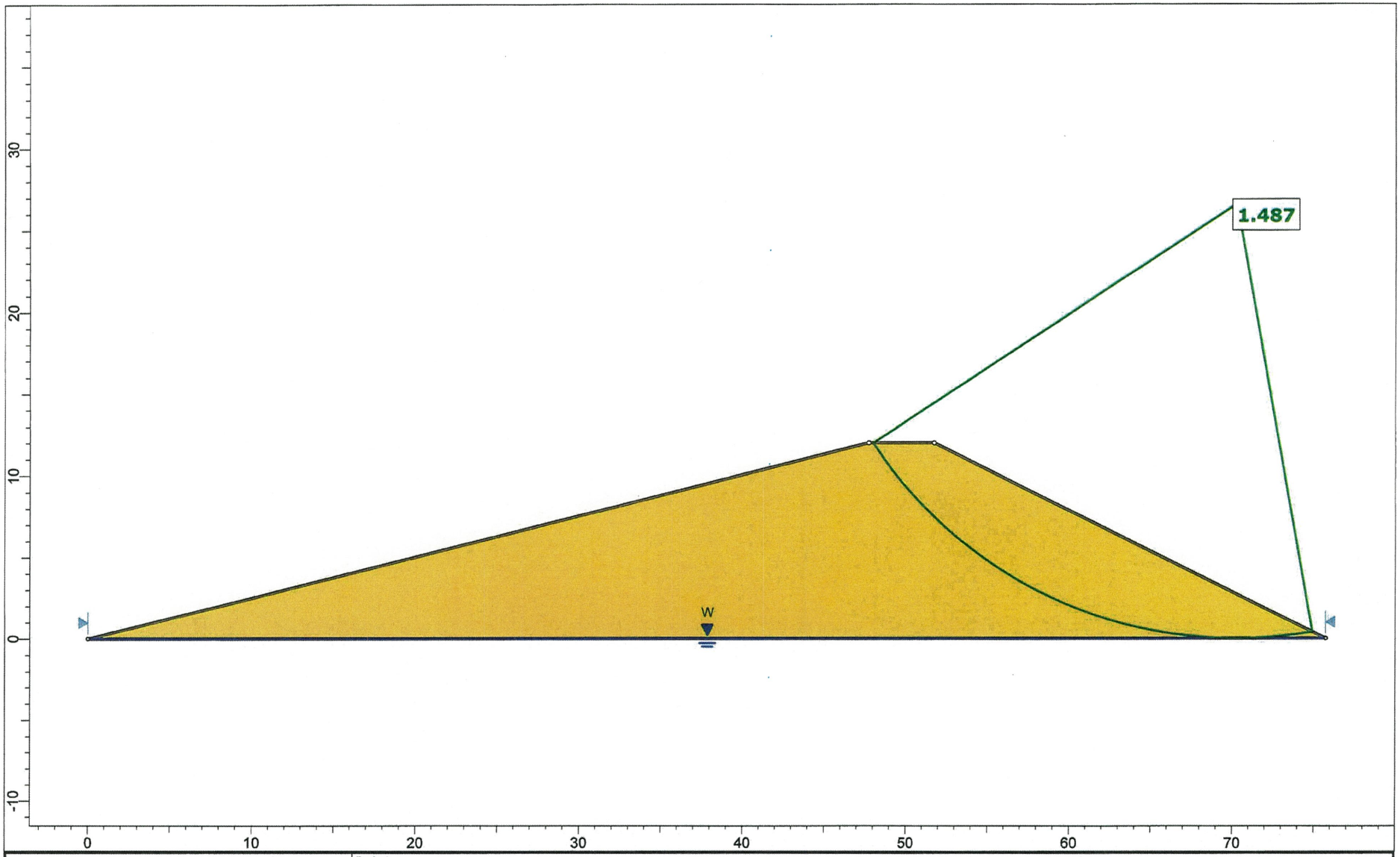


Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Effective_Right_Circular.slmd

Slide Analysis Information

Effective_Right_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

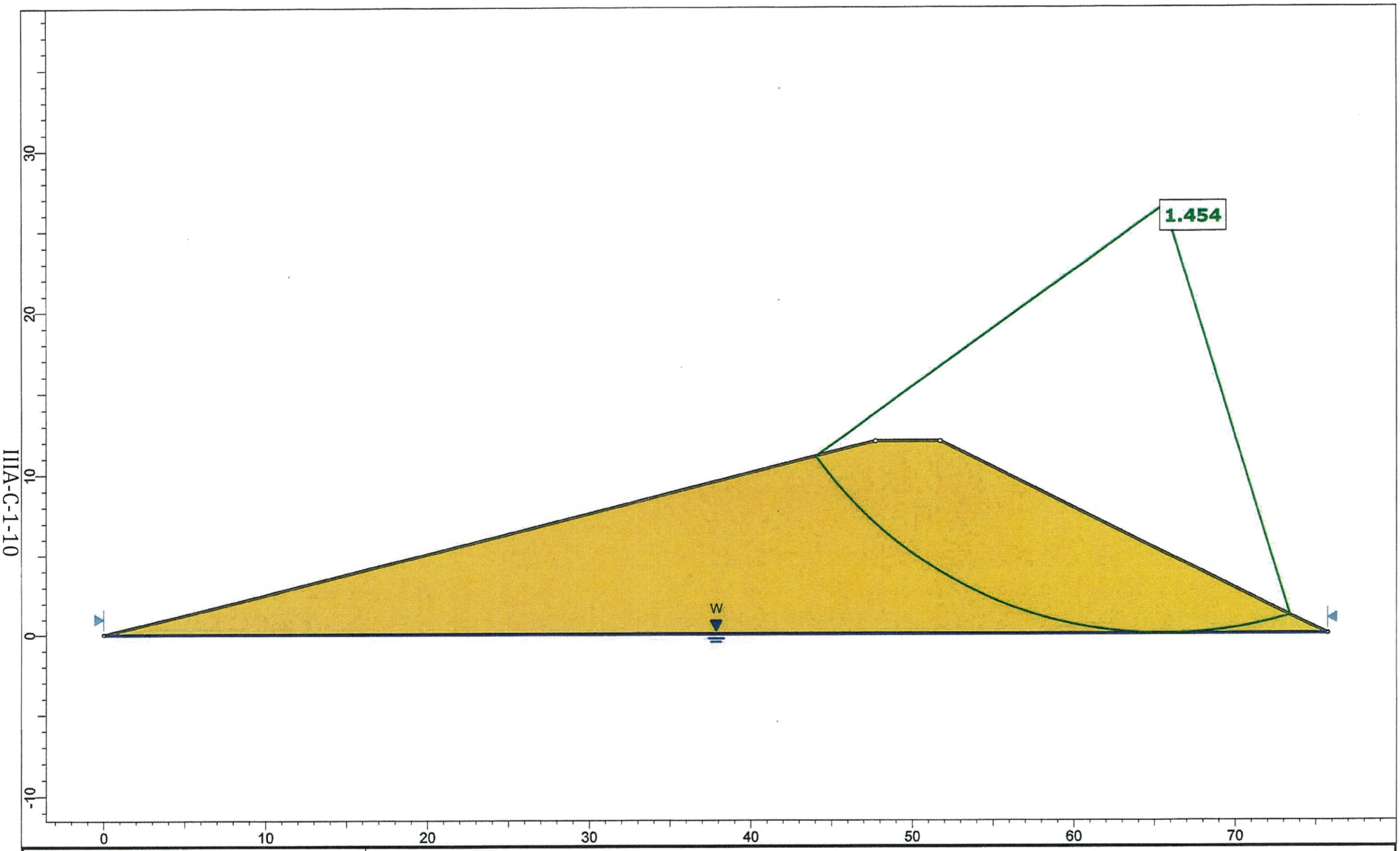
Materials

DIKE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	18
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	1.486630
Center:	70.260, 26.654
Radius:	26.653
Left Slip Surface Endpoint:	47.997, 12.000
Right Slip Surface Endpoint:	74.915, 0.410
Resisting Moment:	187962 lb-ft
Driving Moment:	126435 lb-ft
Total Slice Area:	108.909 ft2
Surface Horizontal Width:	26.918 ft
Surface Average Height:	4.04594 ft



IIIA-C-1-10

Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: TOTAL STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
	Date	12/16/2021	File Name: Total_Right_Circular.slmd

SLIDEINTERPRET 9.018

Slide Analysis Information

Total_Right_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

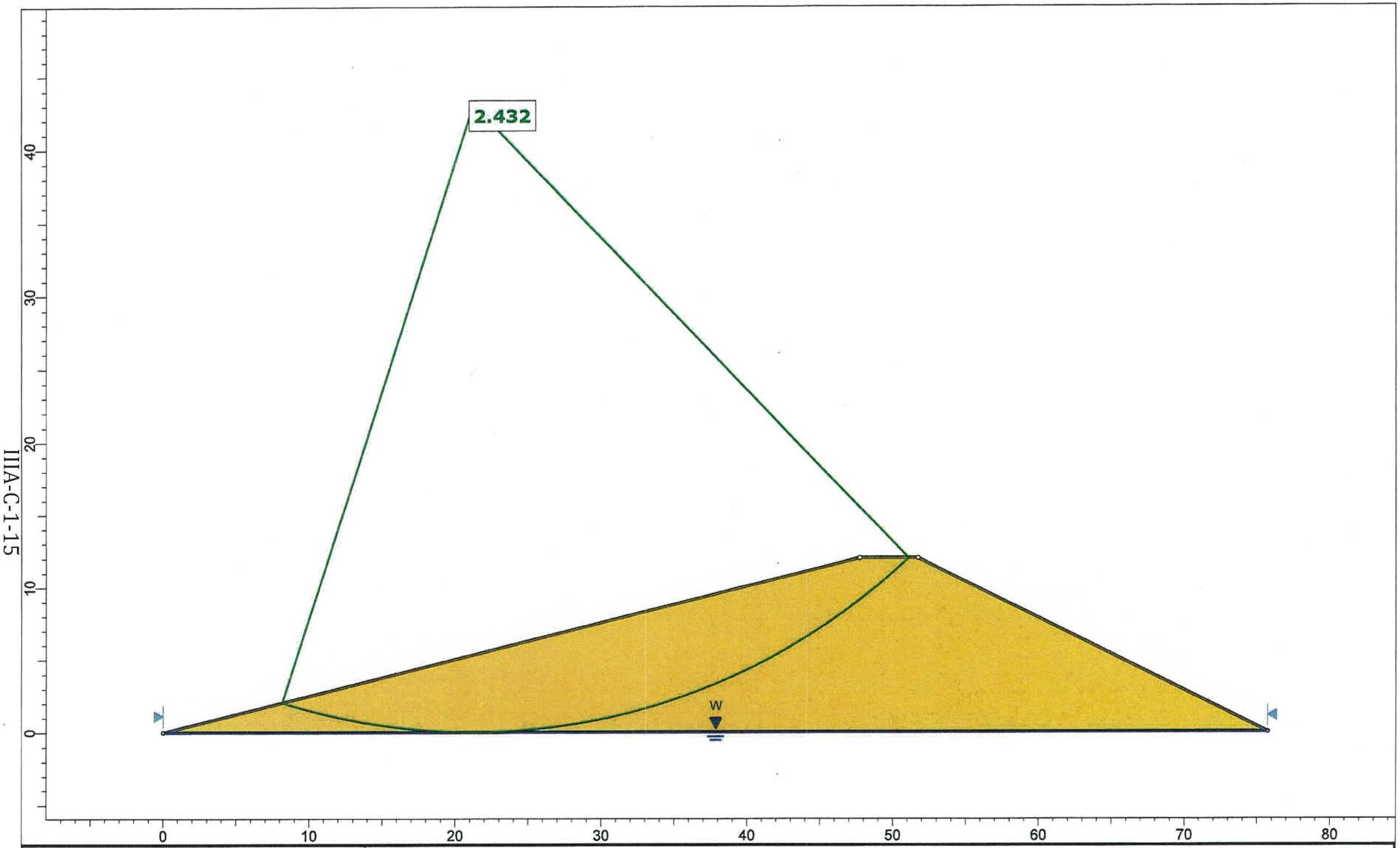
Materials

DIKE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	250
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	1.454370
Center:	65.612, 26.563
Radius:	26.562
Left Slip Surface Endpoint:	44.037, 11.070
Right Slip Surface Endpoint:	73.398, 1.169
Resisting Moment:	219684 lb-ft
Driving Moment:	151052 lb-ft
Total Slice Area:	158.689 ft2
Surface Horizontal Width:	29.3616 ft
Surface Average Height:	5.40464 ft



IIIA-C-1-15

Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Effective_Left_Circular.slmd

Slide Analysis Information

Effective_Left_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

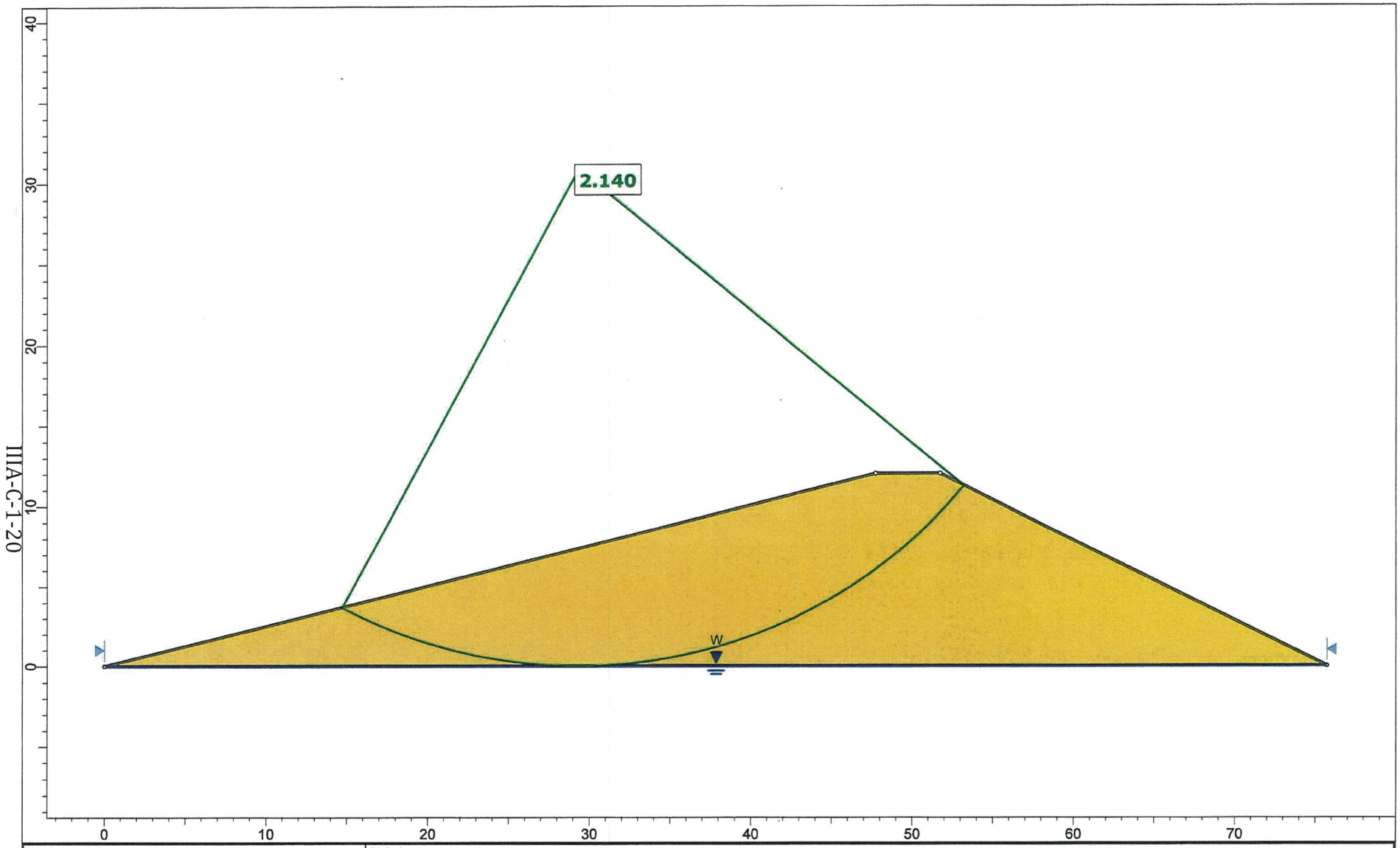
Materials

DIKE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	18
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	2.431850
Center:	21.259, 43.072
Radius:	43.072
Left Slip Surface Endpoint:	8.141, 2.047
Right Slip Surface Endpoint:	51.087, 12.000
Resisting Moment:	522208 lb-ft
Driving Moment:	214737 lb-ft
Total Slice Area:	197.589 ft2
Surface Horizontal Width:	42.9457 ft
Surface Average Height:	4.60092 ft



IIIA-C-1-20

Weaver Consultants Group

SLIDEINTERPRET 9.018

Project	TURKEY CREEK DIKE STABILITY		
Group	ENGINEERING	Scenario	TOTAL STRESS - CIRCULAR
Drawn By	PREP BY: MB CHKD BY:DEP	Company	WEAVER CONSULTANTS GROUP
Date	12/16/2021	File Name	Total_Left_Circular.slmd

Slide Analysis Information

Total_Left_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Materials

DIKE

Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	250
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1

Global Minimums

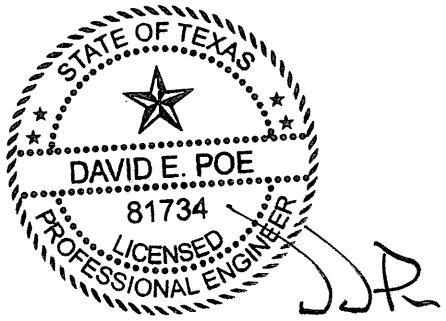
Method: bishop simplified

FS	2.139780
Center:	29.347, 30.887
Radius:	30.887
Left Slip Surface Endpoint:	14.699, 3.695
Right Slip Surface Endpoint:	53.201, 11.267
Resisting Moment:	328304 lb-ft
Driving Moment:	153428 lb-ft
Total Slice Area:	224.789 ft2
Surface Horizontal Width:	38.5026 ft
Surface Average Height:	5.83827 ft

APPENDIX IIIA-C-2

CLASS 1 SIDESLOPE CONTAINMENT DIKE SLOPE STABILITY ANALYSIS (MULTIPLE)

Includes pages IIIA-C-2-1 through IIIA-C-2-47



Purpose: The purpose of this analysis is to demonstrate that the containment dike configurations for above-grade Class waste disposal area are stable against slope failure with a minimum factor of safety of 1.5 for the interim and closed conditions.

Method: The above-grade Class 1 waste stability analysis has been completed using SLIDE2, a computer program developed to model general slope stability. Circular failure surfaces using the Simplified Bishop method and block type failure surfaces using the Rankine method have been generated to analyze the slopes for the configurations given below. Note that these sections were selected to provide a worst case scenario (e.g. steepest and longest slopes).

- Interim Sections - 4H:1V sideslope with containment dikes extending along the sideslope to the approximate landfill crest elevation of 980 ft-msl.
- Closure Sections - 4H:1V sideslope with containment dikes extending along the sideslope to the approximate crest elevation of 980 ft-msl, and a 4-ft-thick infiltration layer (final cover) and 2-ft-protective cover/erosion layer.

The above-grade Class 1 containment dike configurations are shown on Sheet IIIA-C-2-4.

Class 1 Waste Strength Parameters

Additionally, as part of this slope stability analysis of the above-grade Class 1 containment dikes option, The unit weight was considered as 100 pcf. A unit weight of 100 pcf was conservatively selected as the upper limit for Class 1 waste based on (1) WCG's experience and engineering judgement and (2) various reference sources.

Procedure:

1. Input interim and closed condition containment dike configurations.
2. Select strength parameters.
3. Perform analysis to calculate factor of safety.

References:

1. Duncan, J. Michael and Stephen G. Wright., *Soil Strength and Slope Stability*, John Wiley & Sons, I Hoboken, NJ, 2005
2. Terzaghi, Karl, Peck, Ralph B., and Mesri, Gholamreza, *Soil Mechanics in Engineering Practice, Th* John Wiley & Sons, Inc. New York, NY, 1996
3. Day, Robert W., *Geotechnical Engineer's Portable Handbook*, McGraw-Hill Companies, Inc. New York, NY, 2000
4. Abramson, Lee W., Lee, Thomas S., Sharma, Sunil, Boyce, Glenn M., *Slope Stability and Stabilizati Methods, 2nd Ed.*, John Wiley & Sons, Inc., New York.
5. SLIDE2 (computer program for slope stability analyses), Rocscience Inc.

Input Interim and Closed Condition Containment Dike Configurations

The configurations analyzed for this section are presented on Sheet IIIA-C-2-4 (build-out and closed conditions).

Select Strength Parameters

The slope stability analysis has been developed for both total and effective stress conditions to address short and long term conditions that will exist after the installation of the dikes. The selected strength parameters for the containment dike and other materials are described below.

EFFECTIVE STRESS SOIL PROPERTIES

Unit	Unit Weight		Cohesion Intercept	Friction Angle	Comments
	Moist (pcf)	Saturated (pcf)	(psf)	(deg)	
Upper Sand	125.9	129.7	1000	39.1	These values match the values used in the geotechnical report. Refer to Appendix IIIM for more information.
Bounding Shale	133	135	1000	38.6	
Dike	116	120	100	16	Refer to page IIIA-C-1-3 for more information.
Class 1 Waste	100	100	288	23	
Final Cover	116	120	100	16	These values match the values used in the geotechnical report. Refer to Appendix IIIM for more information.
Protective Cover	120	125	100	16	
Clay Liner	120	125	100	16	
MSW	59	59	100	21	

TOTAL STRESS SOIL PROPERTIES

Unit	Unit Weight		Cohesion Intercept	Friction Angle	Comments
	Moist (pcf)	Saturated (pcf)	(psf)	(deg)	
Upper Sand	125.9	129.7	2500	0	These values match the values used in the geotechnical report. Refer to Appendix IIIM, Table 6.1 for more information.
Bounding Shale	133	135	4100	0	
Dike	116	120	250	0	Refer to page IIIA-C-1-3 for more information.
Waste	100	100	288	23	
Final Cover	116	120	100	16	These values match the values used in the geotechnical report. Refer to Appendix IIIM for more information.
Protective Cover	120	125	100	16	
Clay Liner	120	125	100	16	
MSW	59	59	100	21	

Class 1 Waste Strength Parameters

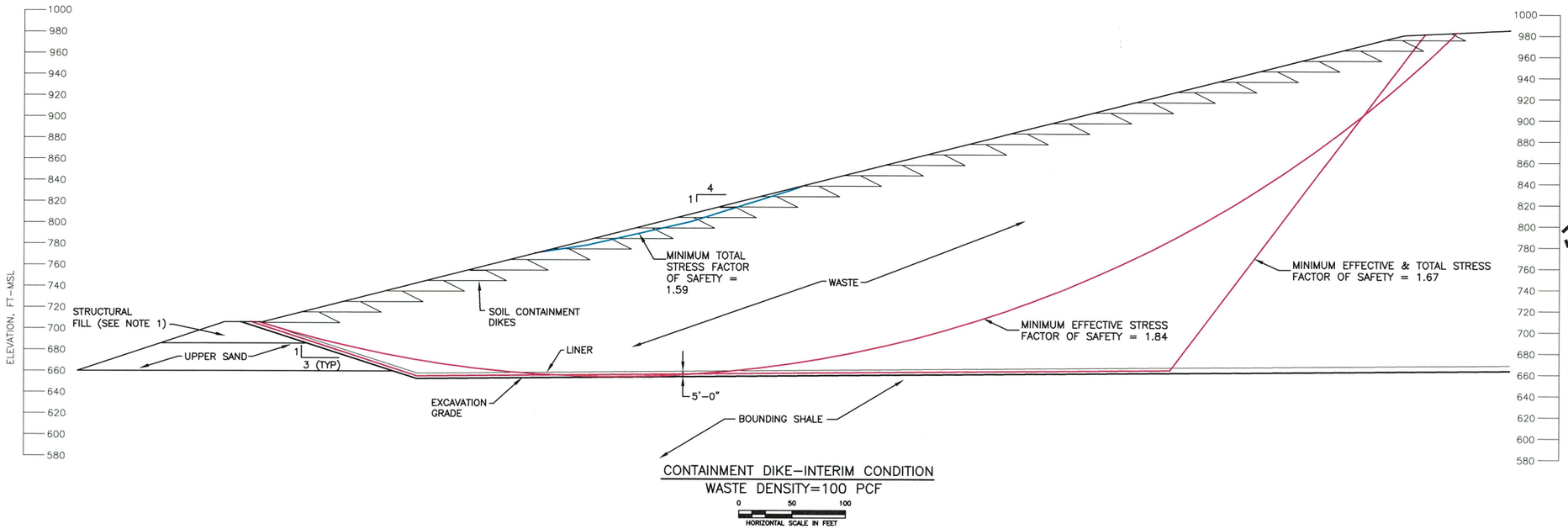
Additionally, as part of this slope stability analysis of the above-grade Class 1 area, the unit weight of waste was varied to determine its effect on the slope stability. The unit weight was considered as 100 pcf. A unit weight of 100 pcf was conservatively selected as the upper limit for Class 1 waste based on (1) WCG's experience and engineering judgement and (2) various reference sources.

Conclusion

The calculated factors of safety are summarized on Sheet IIIA-C-2-4 and Table 2-1, below. As noted, all the calculated factors of safety for long term stability, using conservatively selected strength parameters, are above 1.5. Factors of safety for short-term stability (prior to waste placement against the dike) are above 1.3. Additionally, the results demonstrate the unit weight values assumed for the Class 1 waste both result in acceptable factors of safety. Therefore, the proposed design meets 30 TAC §335.590(24)(F)(i)(II) which requires the containment dike to "be physically stable against slope failure, with a minimum safety factor of 1.5."

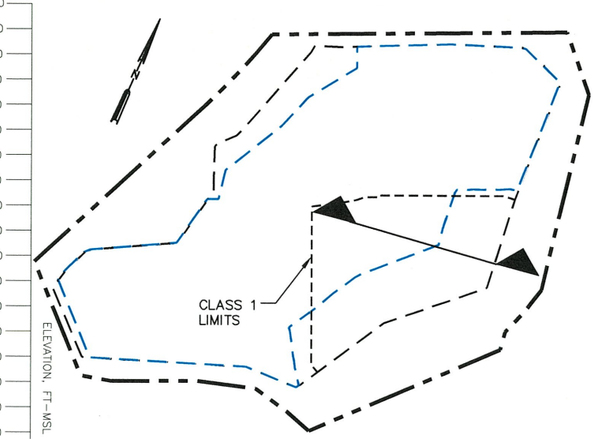
Table 2-1
Stability Analysis Results

Slope Designation	Method of Analysis	Minimum Factor of Safety Generated		Recommended Minimum Factor of Safety	Acceptable Factor of Safety
		Total Stress	Effective Stress		
Containment Dikes Extending to Maximum Allowable					
Interim Condition - At Construction (Waste Density = 100 pcf)	Bishop-Circular	1.59	1.84	1.5	YES
	Rankine-Block	1.67	1.67	1.5	YES
Closed Condition (Waste Density = 59 pcf)	Bishop-Circular	1.87	1.83	1.5	YES
	Rankine-Block	1.67	1.67	1.5	YES

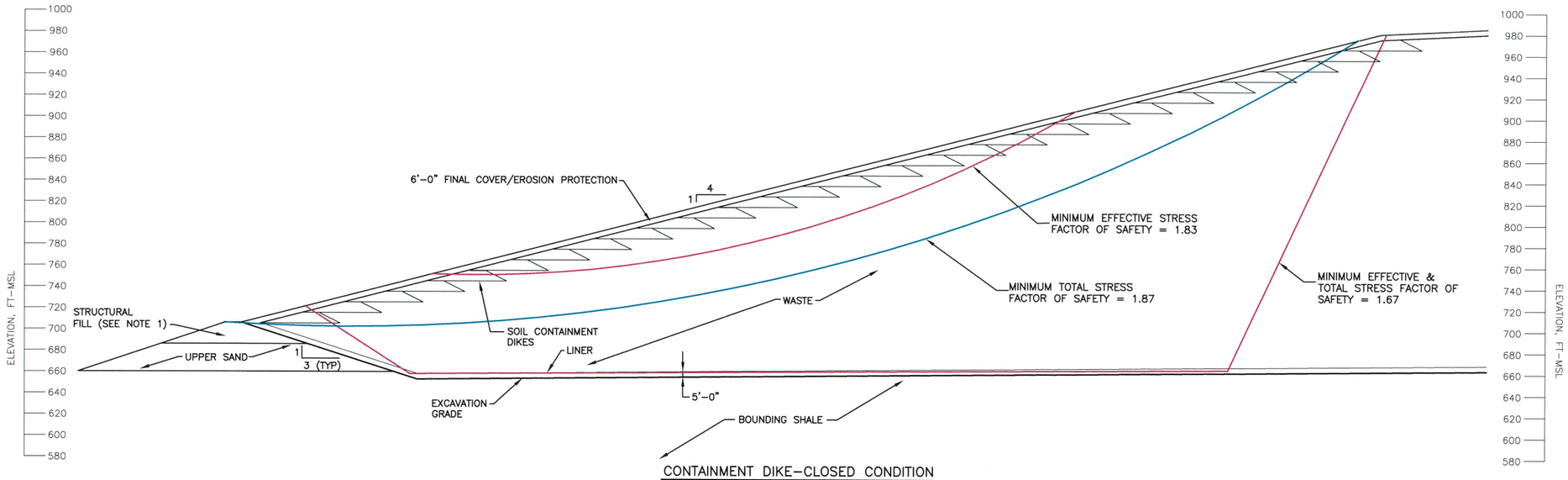


CONTAINMENT DIKE–INTERIM CONDITION
WASTE DENSITY=100 PCF

0 50 100
HORIZONTAL SCALE IN FEET



SECTION LOCATION MAP
NTS



CONTAINMENT DIKE–CLOSED CONDITION
WASTE DENSITY=100 PCF

0 50 100
HORIZONTAL SCALE IN FEET

STATE OF TEXAS
DAVID E. POE
81734
LICENSED PROFESSIONAL ENGINEER
02-22-2022

NOTES:

1. STRUCTURAL FILL TO BE PLACED IN ACCORDANCE WITH THE LINER QUALITY CONTROL PLAN.

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DATE: 02/2022
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DESIGN BY: MDM/RCE
REVIEWED BY: DEP

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
SLOPE STABILITY
SECTION–INTERIM CONDITION

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

SHEET IIIA-C-2-4

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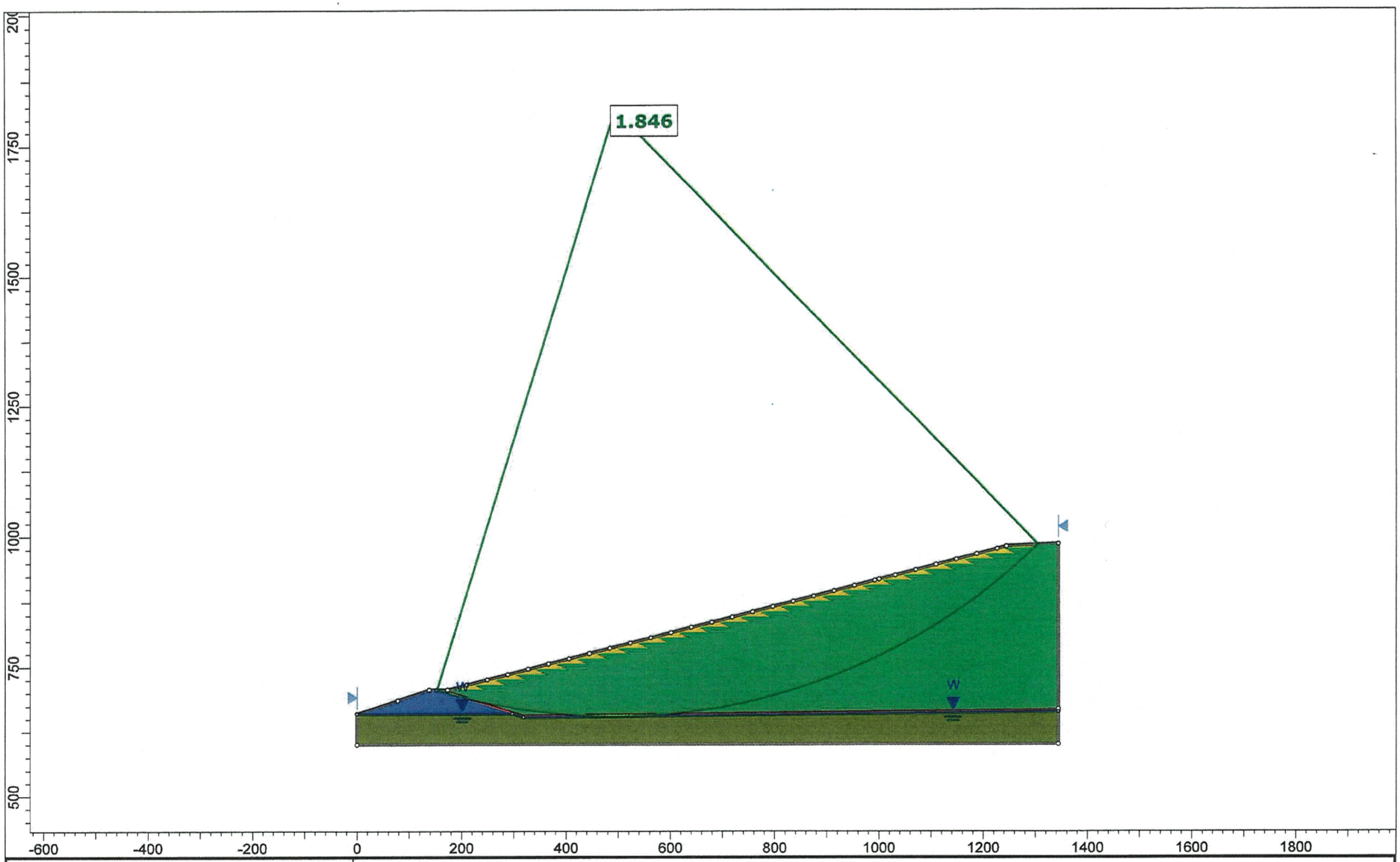


Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Effective_Interim_Circular.slmd

Slide Analysis Information

Effective_Interim_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

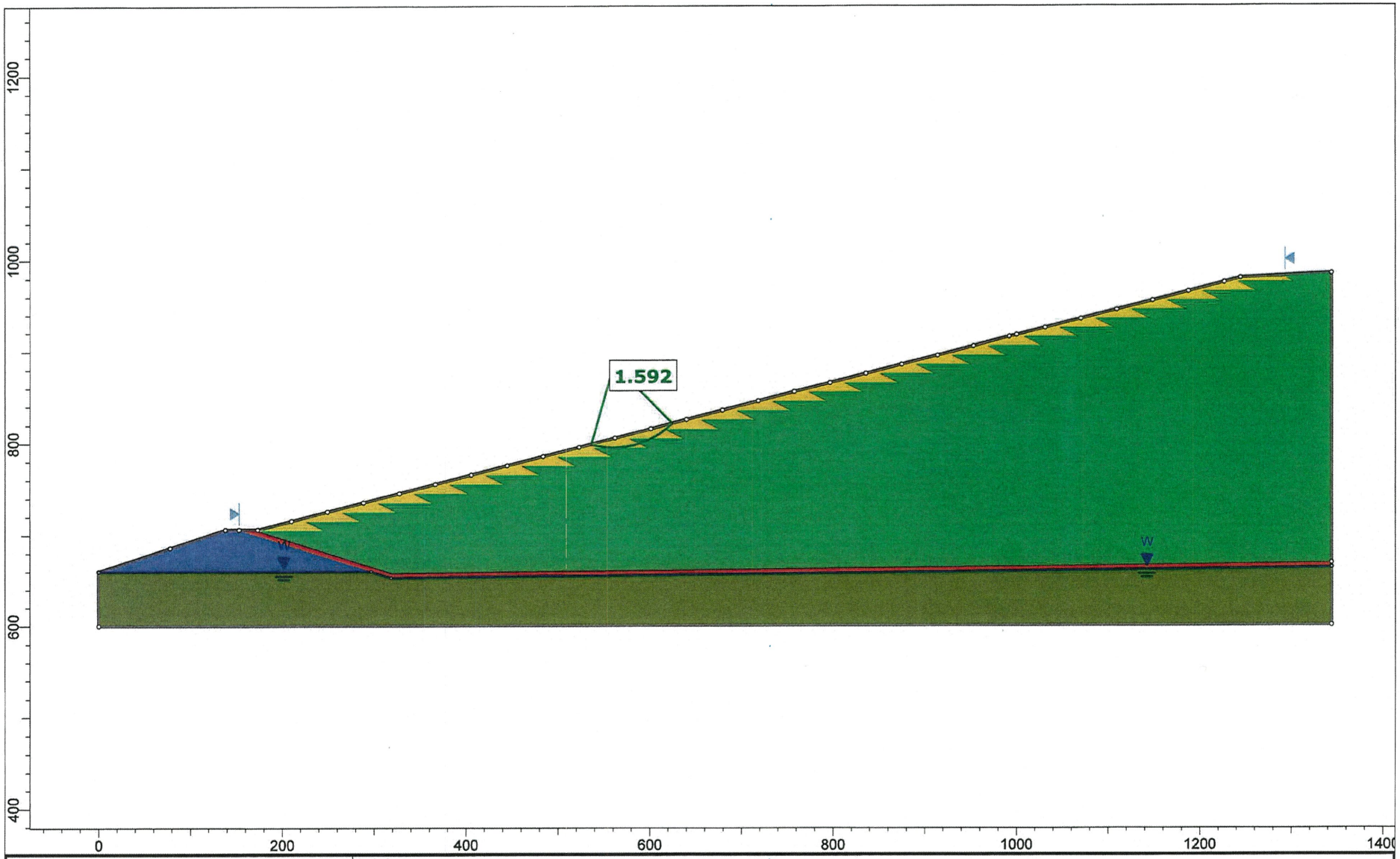
Materials

CONT_DIKES	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	1000
Friction Angle [deg]	39.1
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	1000
Friction Angle [deg]	38.6
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	1.845710
Center:	494.652, 1818.749
Radius:	1164.023
Left Slip Surface Endpoint:	152.980, 706.000
Right Slip Surface Endpoint:	1304.903, 983.020
Resisting Moment:	6.54495e+09 lb-ft
Driving Moment:	3.54603e+09 lb-ft
Total Slice Area:	133652 ft2
Surface Horizontal Width:	1151.92 ft
Surface Average Height:	116.025 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: TOTAL STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Total_Interim_Circular.slmd

Slide Analysis Information

Total_Interim_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

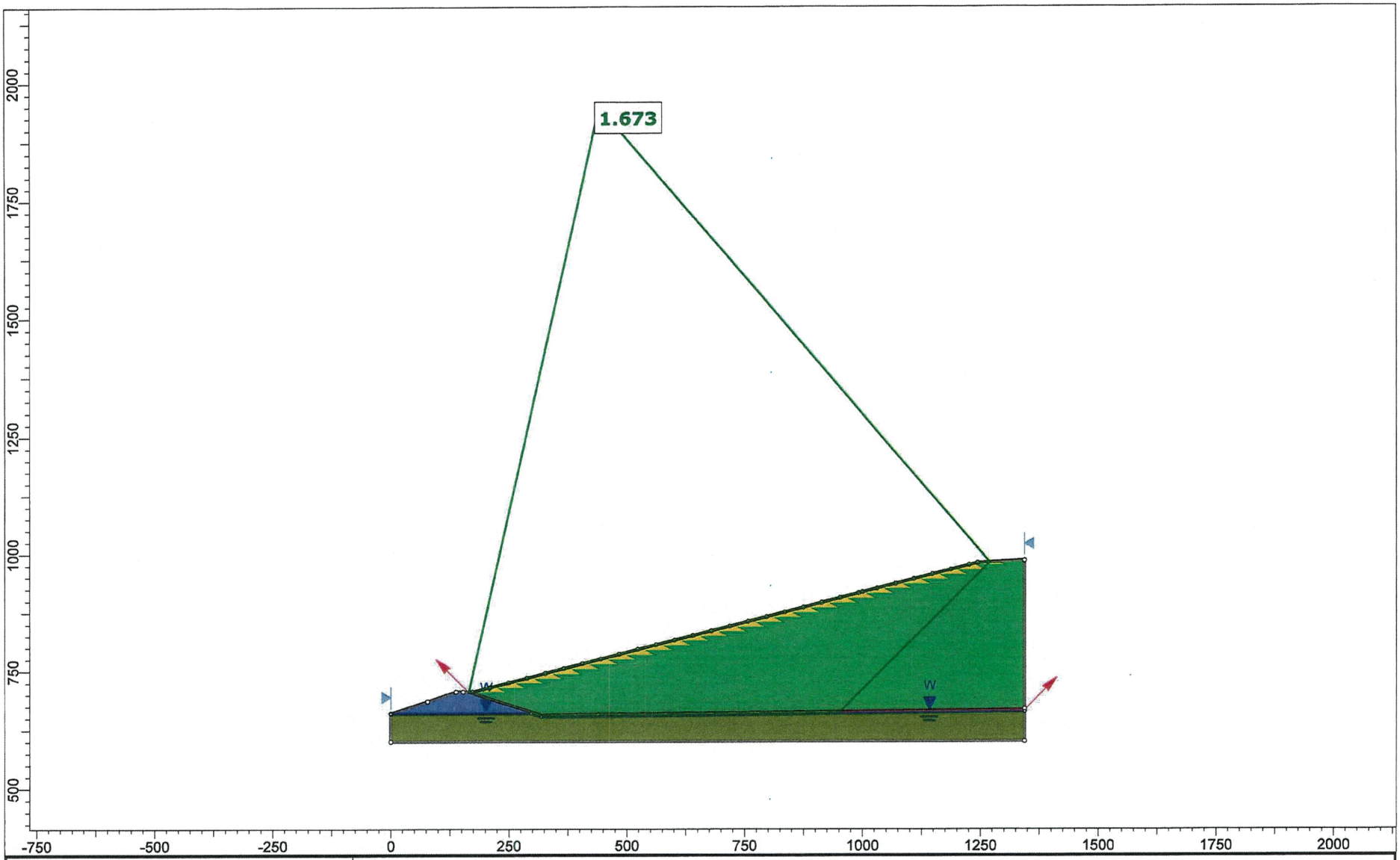
Materials

CONT_DIKES	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	250
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	2500
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	4100
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	1.591950
Center:	561.117, 885.492
Radius:	90.039
Left Slip Surface Endpoint:	536.427, 798.904
Right Slip Surface Endpoint:	624.347, 821.390
Resisting Moment:	2.79654e+06 lb-ft
Driving Moment:	1.75667e+06 lb-ft
Total Slice Area:	752.695 ft2
Surface Horizontal Width:	87.92 ft
Surface Average Height:	8.56114 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - BLOCK
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
	Date	12/16/2021	File Name: Effective_Interim_Block.slmd

SLIDEINTERPRET 9.018

Slide Analysis Information

Effective_Interim_Block

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

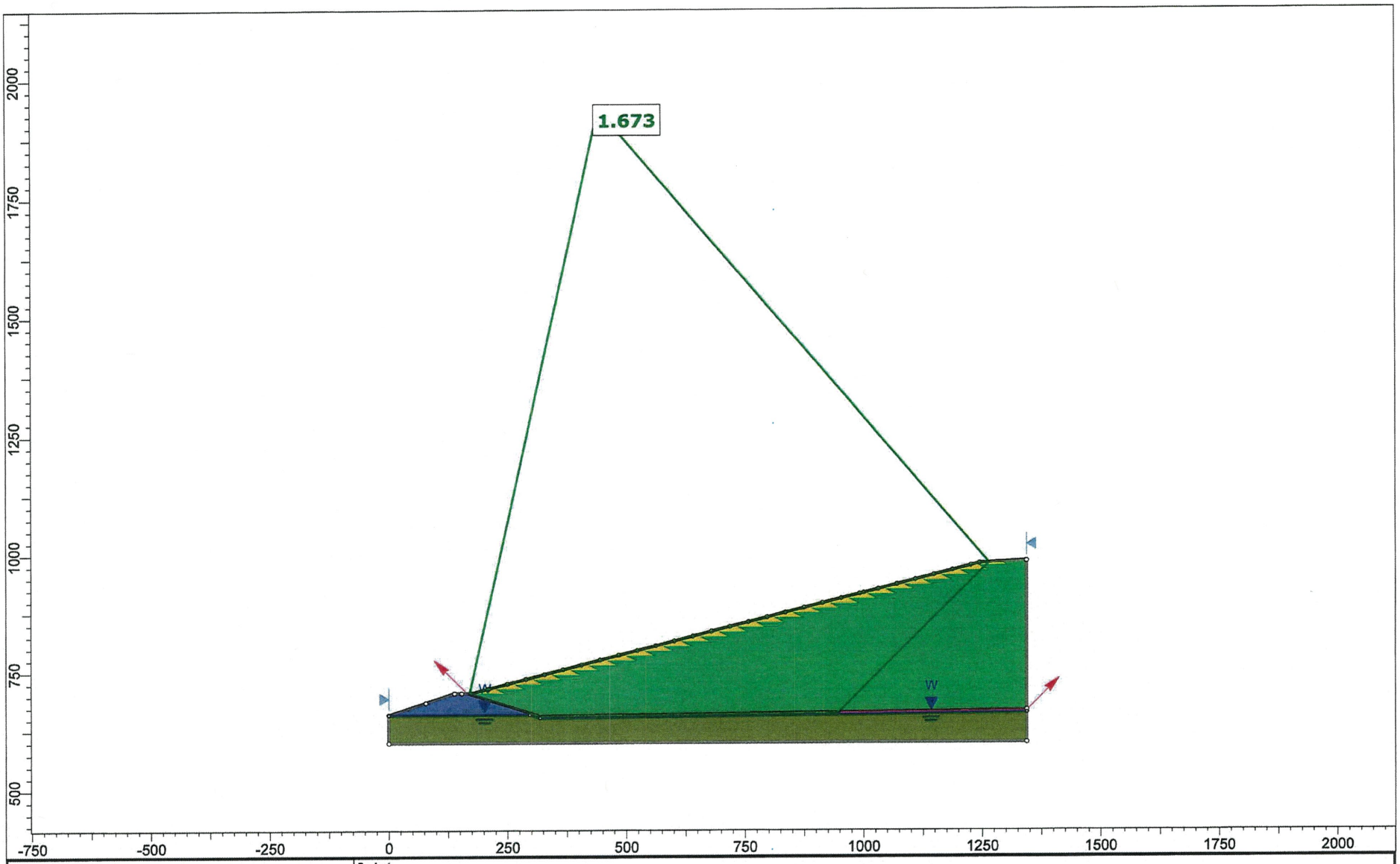
Materials

CONT_DIKES	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	1000
Friction Angle [deg]	39.1
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	1000
Friction Angle [deg]	38.6
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	1.673420
Axis Location:	442.301, 1949.036
Left Slip Surface Endpoint:	164.895, 706.000
Right Slip Surface Endpoint:	1270.286, 981.289
Resisting Moment:	6.86035e+09 lb-ft
Driving Moment:	4.0996e+09 lb-ft
Total Slice Area:	150640 ft2
Surface Horizontal Width:	1105.39 ft
Surface Average Height:	136.278 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: TOTAL STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
	Date	12/16/2021	File Name: Total_Interim_Block.slmd

SLIDEINTERPRET 9.018

Slide Analysis Information

Total_Interim_Block

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

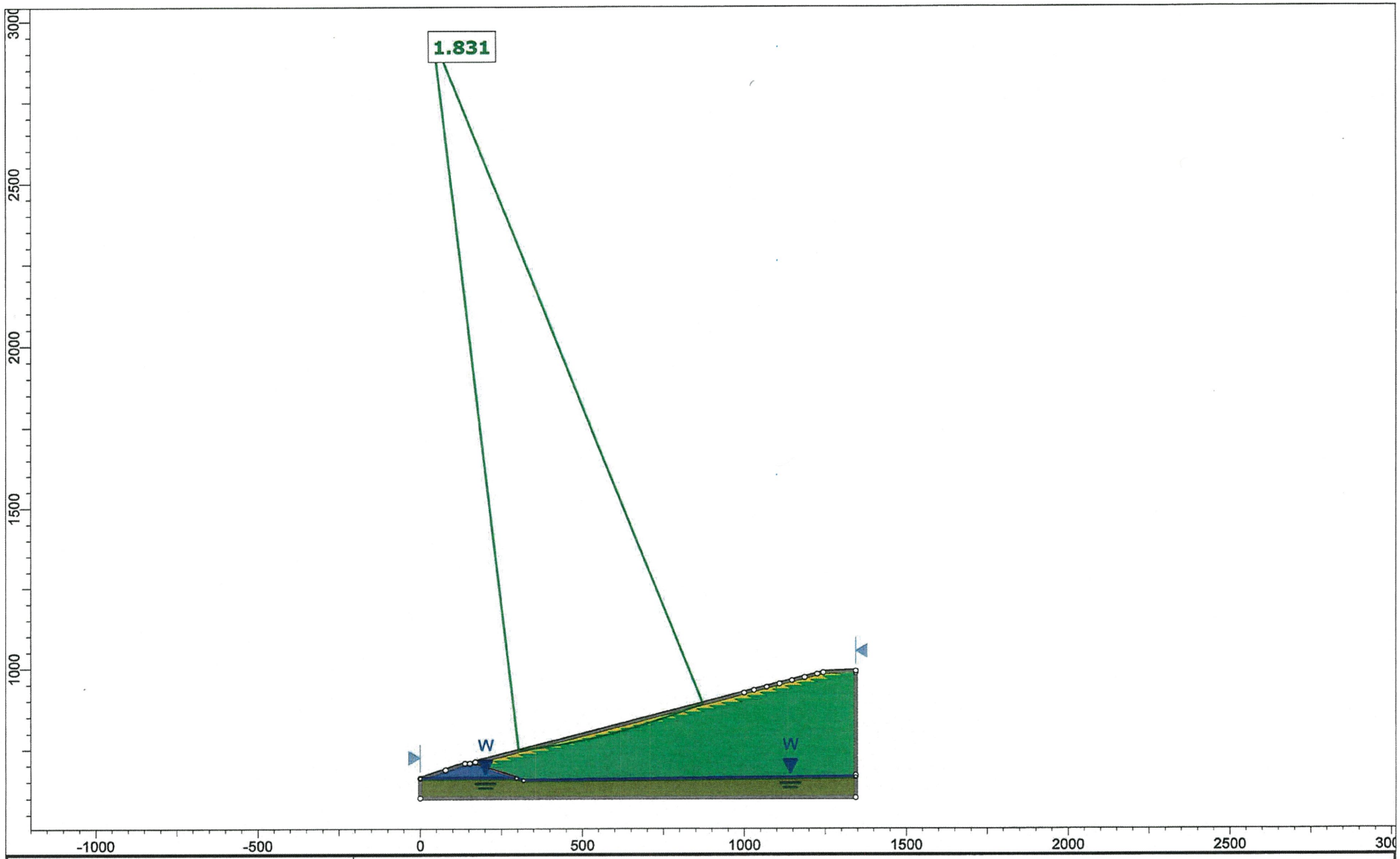
Materials

CONT_DIKES	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	250
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	2500
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	4100
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	1.673290
Axis Location:	442.164, 1938.206
Left Slip Surface Endpoint:	169.812, 706.000
Right Slip Surface Endpoint:	1264.517, 981.001
Resisting Moment:	6.72394e+09 lb-ft
Driving Moment:	4.0184e+09 lb-ft
Total Slice Area:	148884 ft2
Surface Horizontal Width:	1094.71 ft
Surface Average Height:	136.003 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Effective_Final_Circular.slmd

Slide Analysis Information

Effective_Final_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Materials

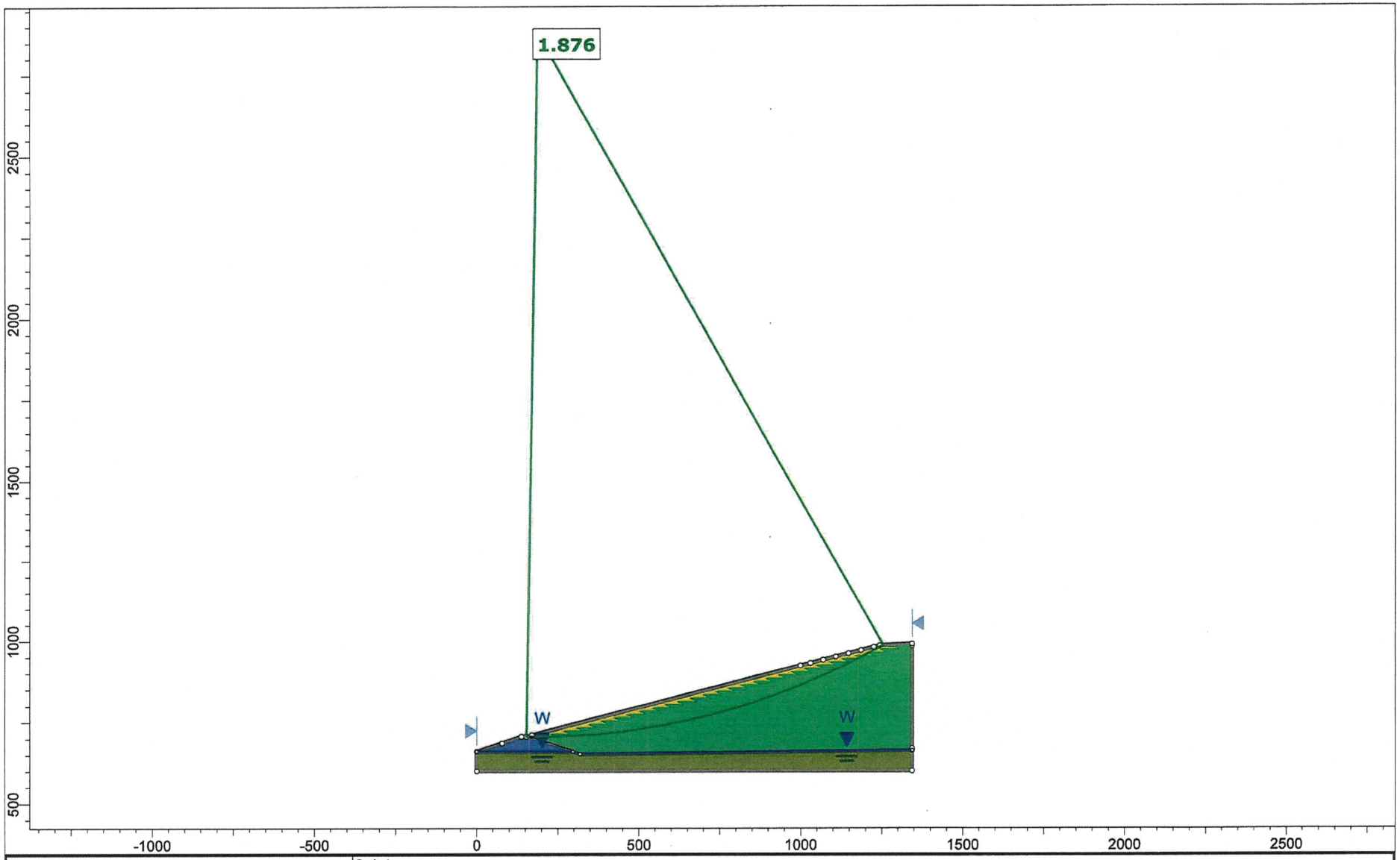
CONT_DIKES	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	1000
Friction Angle [deg]	39.1
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	1000
Friction Angle [deg]	38.6
Water Surface	Water Table
Hu Value	1
FC	

Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.830690
Center:	40.558, 2954.888
Radius:	2225.995
Left Slip Surface Endpoint:	303.393, 744.464
Right Slip Surface Endpoint:	871.251, 889.699
Resisting Moment:	8.68904e+08 lb-ft
Driving Moment:	4.74633e+08 lb-ft
Total Slice Area:	7574.68 ft2
Surface Horizontal Width:	567.858 ft
Surface Average Height:	13.339 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: TOTAL STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Total_Final_Circular.slmd

Slide Analysis Information

Total_Final_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Materials

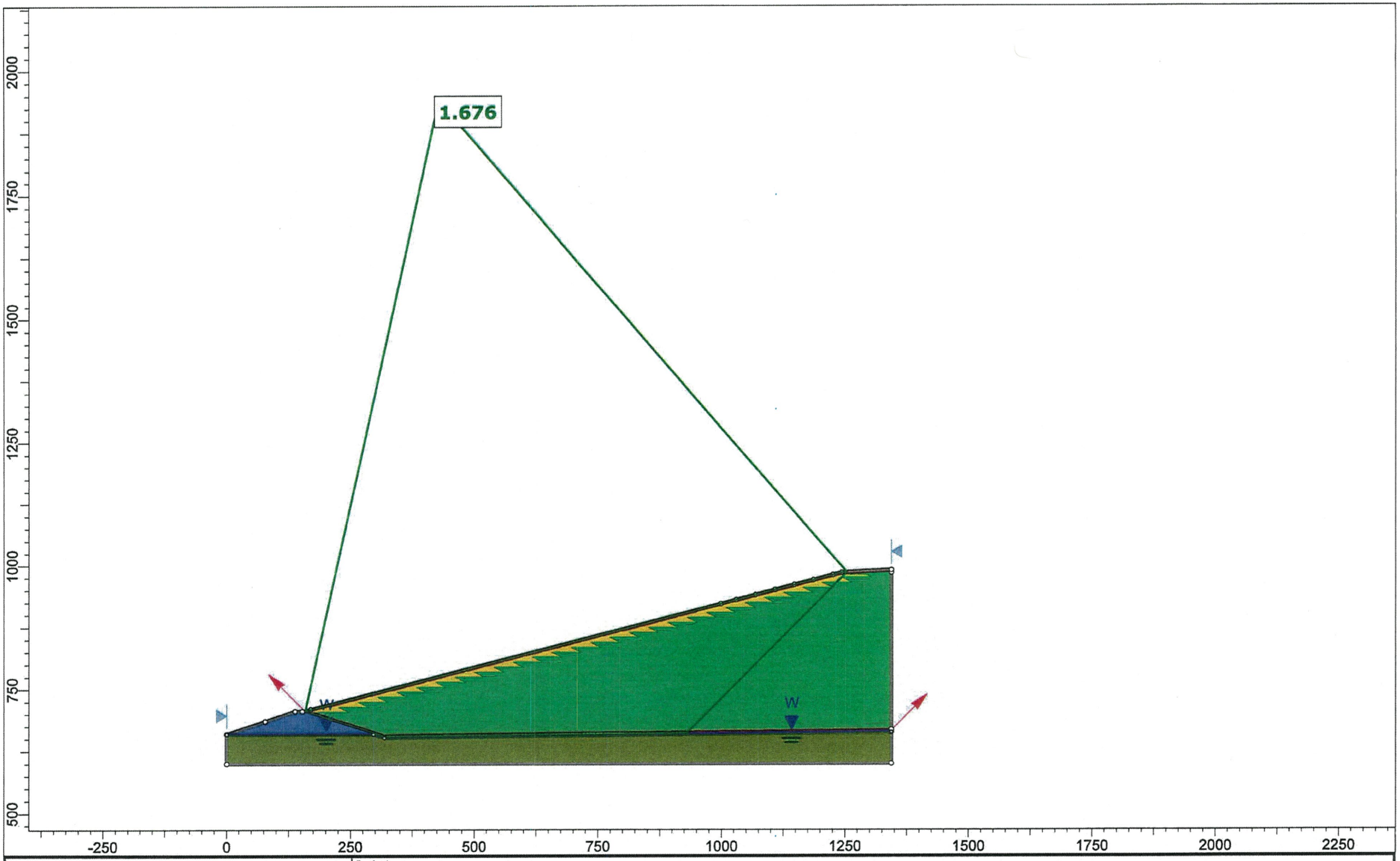
CONT_DIKES	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	250
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	2500
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	4100
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1
FC	

Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	Water Table
Hu Value	0

Global Minimums

Method: bishop simplified

FS	1.876090
Center:	187.746, 2879.857
Radius:	2174.135
Left Slip Surface Endpoint:	152.968, 706.000
Right Slip Surface Endpoint:	1254.672, 985.515
Resisting Moment:	6.07691e+09 lb-ft
Driving Moment:	3.23913e+09 lb-ft
Total Slice Area:	58675.2 ft2
Surface Horizontal Width:	1101.7 ft
Surface Average Height:	53.2586 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - BLOCK
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
	Date	12/16/2021	File Name: Effective_Final_Block.slmd

SLIDEINTERPRET 9.018

Slide Analysis Information

Effective_Final_Block

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Materials

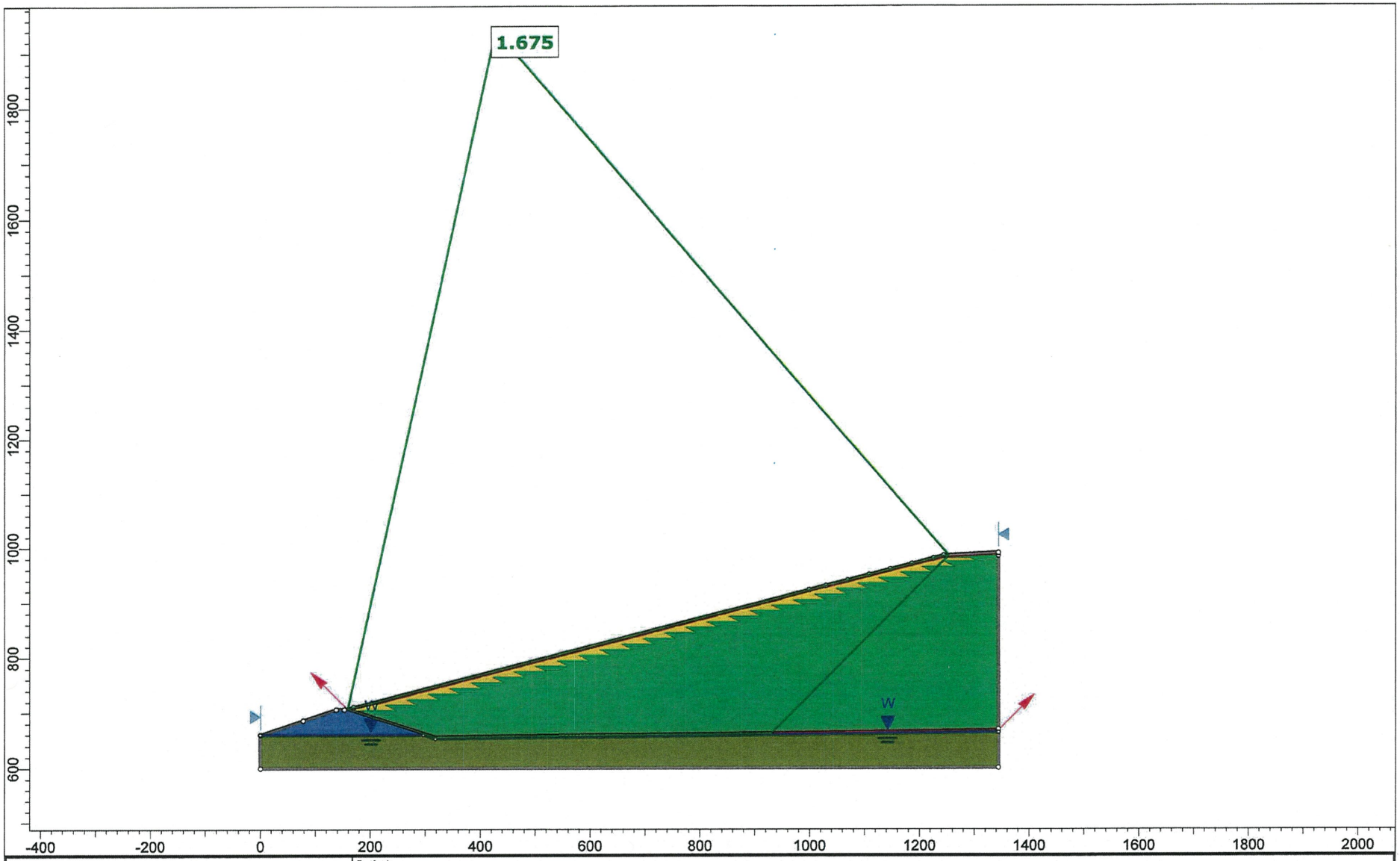
CONT_DIKES	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	1000
Friction Angle [deg]	39.1
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	1000
Friction Angle [deg]	38.6
Water Surface	Water Table
Hu Value	1
FC	

Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.676140
Axis Location:	428.368, 1941.007
Left Slip Surface Endpoint:	159.031, 707.542
Right Slip Surface Endpoint:	1253.537, 985.458
Resisting Moment:	6.81556e+09 lb-ft
Driving Moment:	4.06622e+09 lb-ft
Total Slice Area:	149700 ft2
Surface Horizontal Width:	1094.51 ft
Surface Average Height:	136.774 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: TOTAL STRESS - BLOCK
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Total_Final_Block.slmd

Slide Analysis Information

Total_Final_Block

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Materials

CONT_DIKES	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	250
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	2500
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	4100
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1
FC	

Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

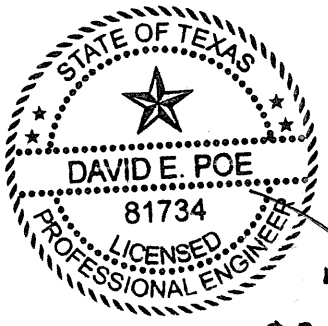
Method: bishop simplified

FS	1.675090
Axis Location:	428.368, 1941.007
Left Slip Surface Endpoint:	159.031, 707.542
Right Slip Surface Endpoint:	1253.537, 985.458
Resisting Moment:	6.81122e+09 lb-ft
Driving Moment:	4.06619e+09 lb-ft
Total Slice Area:	149700 ft2
Surface Horizontal Width:	1094.51 ft
Surface Average Height:	136.774 ft

APPENDIX IIIA-C-3

CLASS 1 SOIL COVER
SYSTEM OPTION STABILITY ANALYSIS (MULTIPLE)

Includes pages IIIA-C-3-1 through IIIA-C-3-44



DJP

02-22-2022

Required: Evaluate the slope stability of the Class 1 waste fill area with the 4-foot thick Soil Cover System for interim conditions and final closure conditions.

Given:

1. The plan section locations for the slope stability analyses are provided on Sheet IIIA-C-3-4.

Method:

A. Evaluate the stability of the proposed exterior sideslopes for the interim conditions, final condition, and perimeter containment dike Class 1 waste area.

1. Determine the most critical interim condition and final closed condition.
2. Obtain soil and material properties (including unit weights and strength parameters) from Appendix IIIA-C-1.
3. Perform stability analyses.
    a. Analyze the interim condition using SLIDE2, and the simplified Bishop method of circular failure surfaces. Use drained effective stress parameters to model long-term conditions after construction.
    b. Analyze the final condition using SLIDE2, and the Rankine method of block failure surfaces. Use drained effective stress parameters to model long-term conditions after construction.

References:

1. Duncan, J.M. and Buchignani, A.L., *An Engineering Manual for Slope Stability Studies,* Department of Civil Engineering-University of California-Berkeley, 1975.
2. US Army Corps of Engineers, *Slope Stability* , Engineering and Design Manual, EM 1110-2-1902, October 31, 2003.
3. SLIDE2 (computer program for slope stability analyses), Rocscience Inc.

Solution:

A. Slope stability analyses of the proposed interim condition and final (closed) condition.

1. The location of the critical section selected for the stability analysis is shown on Sheet IIIA-C-3-4.
2. Sections analyzed are shown with the most critical failure surfaces on Sheet IIIA-C-3-4.
3. The soil and material properties (including unit weights and strength parameters) were obtained from Appendix IIIA-C-1, and presented in Table 3-1. Analysis were performed assuming unit weights of the Class 1 waste of 100 pcf.

Conclusion:

1. The results of the analysis are shown on Sheet IIIA-C-3-4, and presented in Table 3-2 below.
2. Based on the slope stability analyses presented in this Appendix, the proposed critical slopes for the interim condition (prior to final closure) and the final condition (closed with final cover installed) have adequate factors of safety to be considered stable.

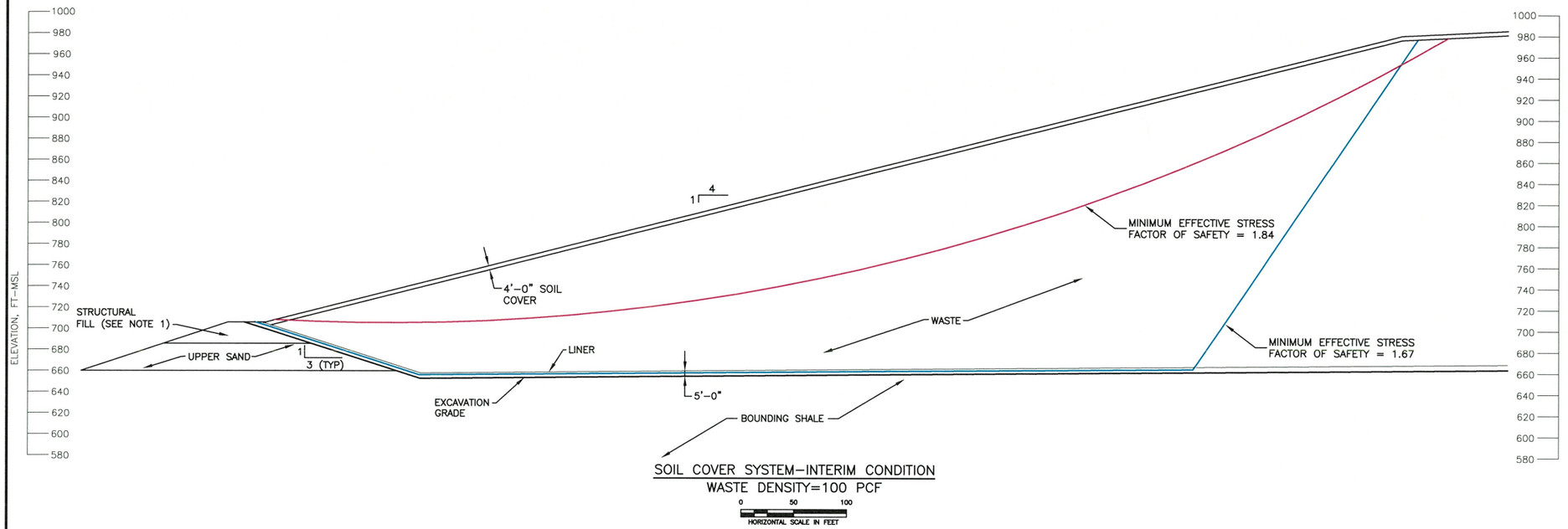
Table 3-1. Summary of Material Properties (Effective Stress) Used in the Slope Stability Analysis

Soil Description[1]	Moist Unit Weight (pcf)	Saturated Unit Weight (pcf)	Cohesion (psf)	Angle of Internal Friction (degrees)
Intermediate Cover/Final Cover Layer	116	120	100	16
Perimeter Containment Dike	116	120	100	16
Waste	100	100	288	23
Liner	116	120	100	16
Upper Sand	125.9	129.7	1,000	39.1
Bounding Shale	133	135	1,000	38.6

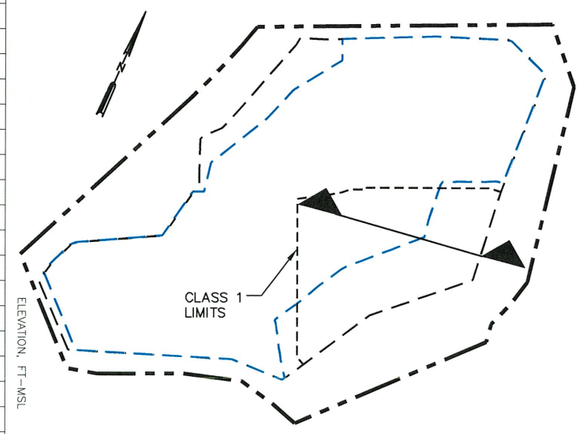
Note
1. Refer to Appendix IIIM for additional description of material properties.

Table 3-2. Stability Analysis Results

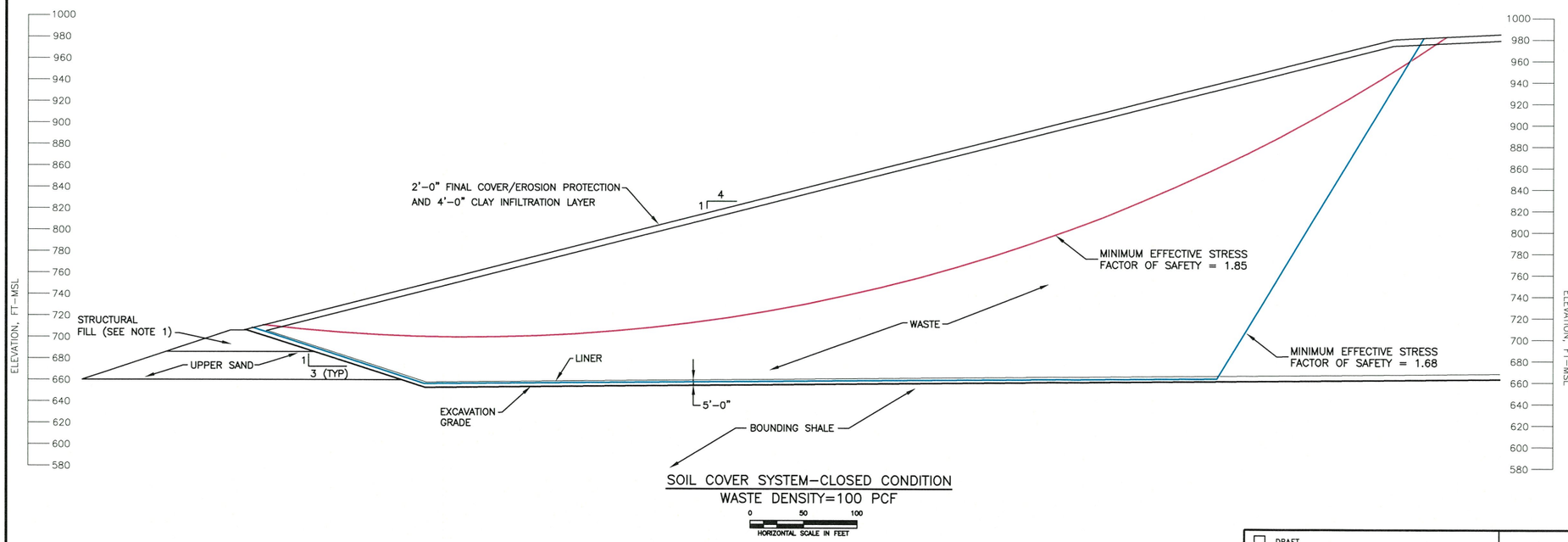
Slope Designation	Method of Analysis	Minimum Factor of Safety Generated		Recommended Minimum Factor of Safety	Acceptable Factor of Safety
		Total Stress	Effective Stress		
Containment Dikes Extending to Maximum Allowable					
Interim Condition - At Construction (Waste Density = 100 pcf)	Bishop-Circular	1.82	1.84	1.5	YES
	Rankine-Block	1.67	1.67	1.5	YES
Closed Condition (Waste Density = 100 pcf)	Bishop-Circular	1.84	1.85	1.5	YES
	Rankine-Block	1.68	1.68	1.5	YES



SOIL COVER SYSTEM–INTERIM CONDITION
WASTE DENSITY=100 PCF



SECTION LOCATION MAP
NTS



SOIL COVER SYSTEM–CLOSED CONDITION
WASTE DENSITY=100 PCF

STATE OF TEXAS
DAVID E. POE
81734
LICENSED PROFESSIONAL ENGINEER
02-22-2022

NOTES:

1. STRUCTURAL FILL TO BE PLACED IN ACCORDANCE WITH THE LINER QUALITY CONTROL PLAN.

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☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 02/2022
FILE: 0771-368-11
CAD: SHEET IIIA-C-3-4.DWG

DRAWN BY: JDW
DESIGN BY: MDM/RCE
REVIEWED BY: DEP

Weaver Consultants Group
TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS

NO.	DATE	DESCRIPTION

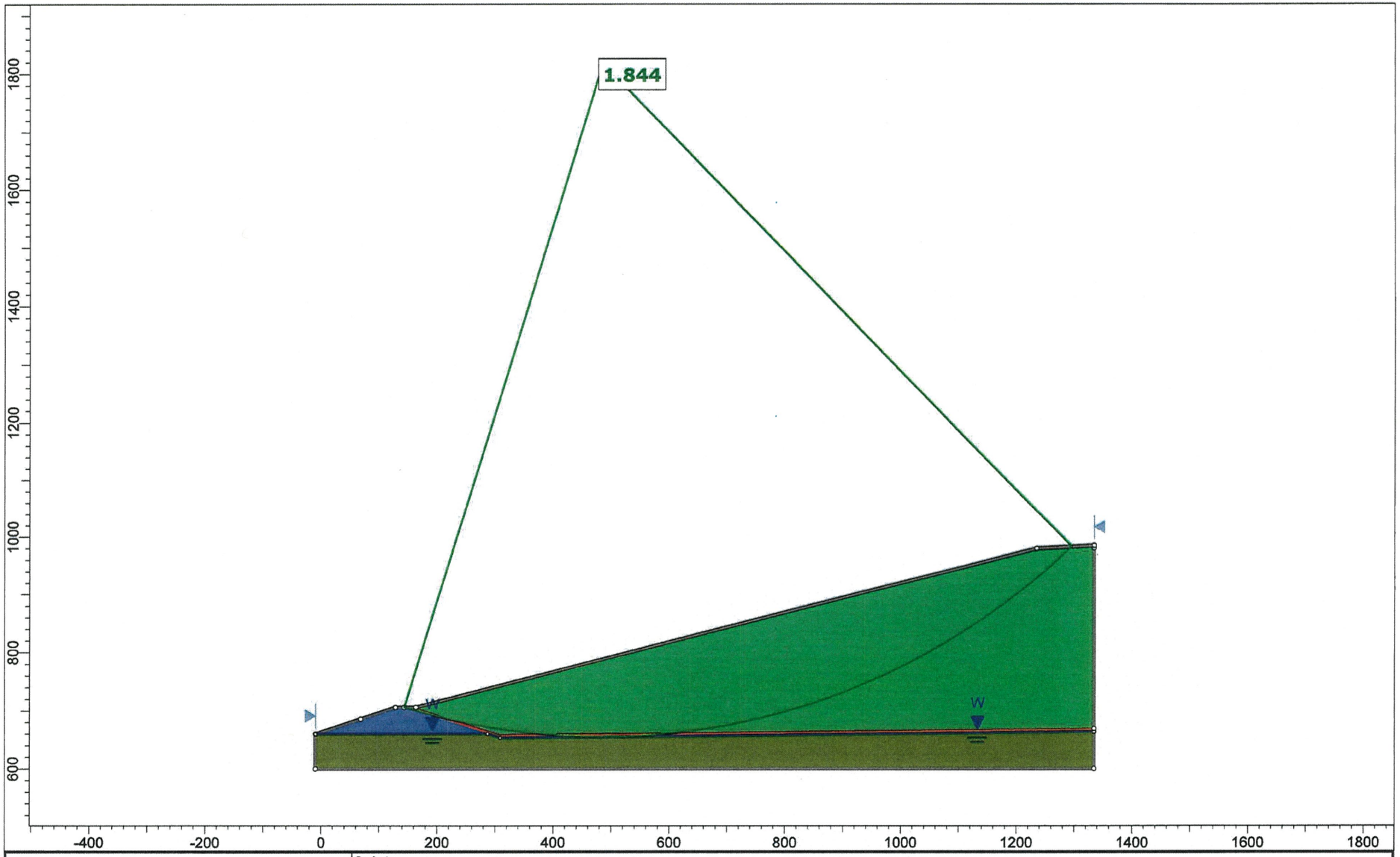
MAJOR PERMIT AMENDMENT
SLOPE STABILITY
SECTION–INTERIM CONDITION

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

WWW.WCGRP.COM

SHEET IIIA-C-3-4

O:\0771\368\EXPANSION 2021\PART III\IIIA\C\SHEET IIIA-C-3-4.dwg, jwilson, 1:2



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Effective_Interim_Circular.slmd

Slide Analysis Information

Effective_Interim_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

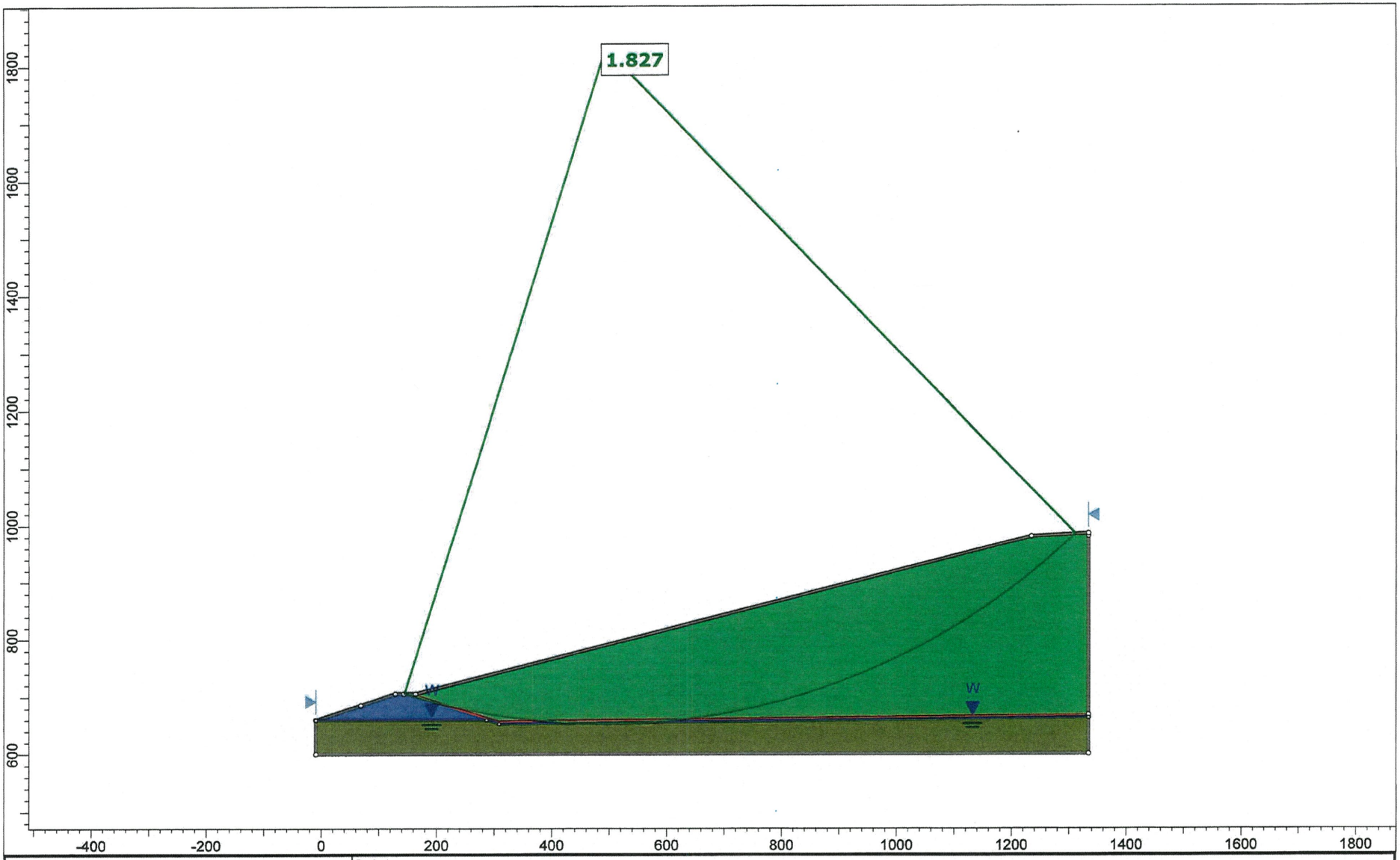
Materials

WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	1000
Friction Angle [deg]	39.1
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	1000
Friction Angle [deg]	38.6
Water Surface	Water Table
Hu Value	1
FC	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.844490
Center:	485.238, 1818.715
Radius:	1163.981
Left Slip Surface Endpoint:	143.600, 706.000
Right Slip Surface Endpoint:	1295.467, 983.023
Resisting Moment:	6.48519e+09 lb-ft
Driving Moment:	3.51598e+09 lb-ft
Total Slice Area:	133667 ft2
Surface Horizontal Width:	1151.87 ft
Surface Average Height:	116.044 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: TOTAL STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
	Date	12/16/2021	File Name: Total_Interim_Circular.slmd

SLIDEINTERPRET 9.018

Slide Analysis Information

Total_Interim_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

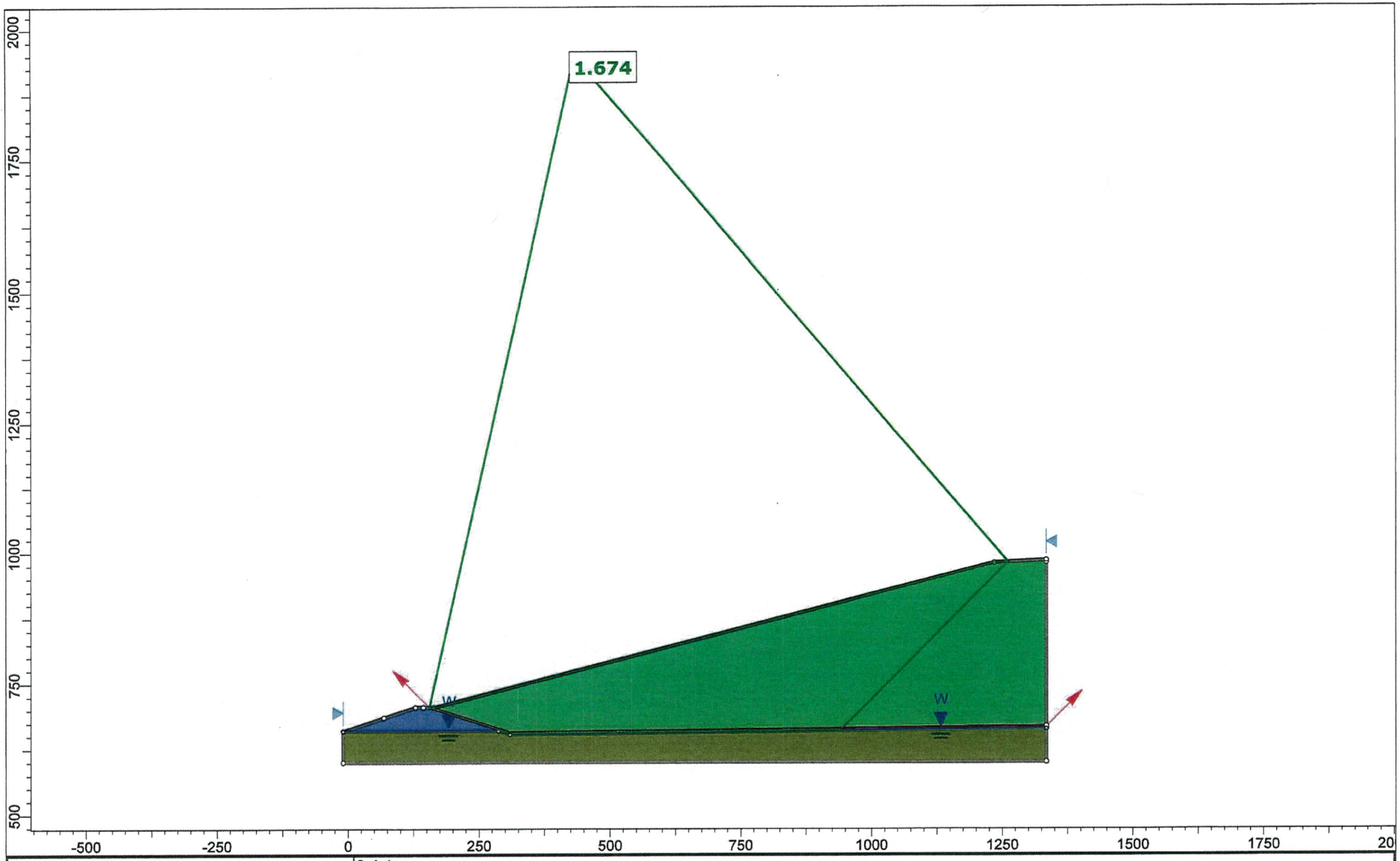
Materials

WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	2500
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	4100
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1
FC	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.827330
Center:	493.984, 1830.169
Radius:	1177.159
Left Slip Surface Endpoint:	144.774, 706.000
Right Slip Surface Endpoint:	1312.192, 983.860
Resisting Moment:	6.73473e+09 lb-ft
Driving Moment:	3.68555e+09 lb-ft
Total Slice Area:	139295 ft2
Surface Horizontal Width:	1167.42 ft
Surface Average Height:	119.319 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - BLOCK
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
	Date	12/16/2021	File Name: Effective_Interim_Block.slmd

SLIDEINTERPRET 9.018

Slide Analysis Information

Effective_Interim_Block

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

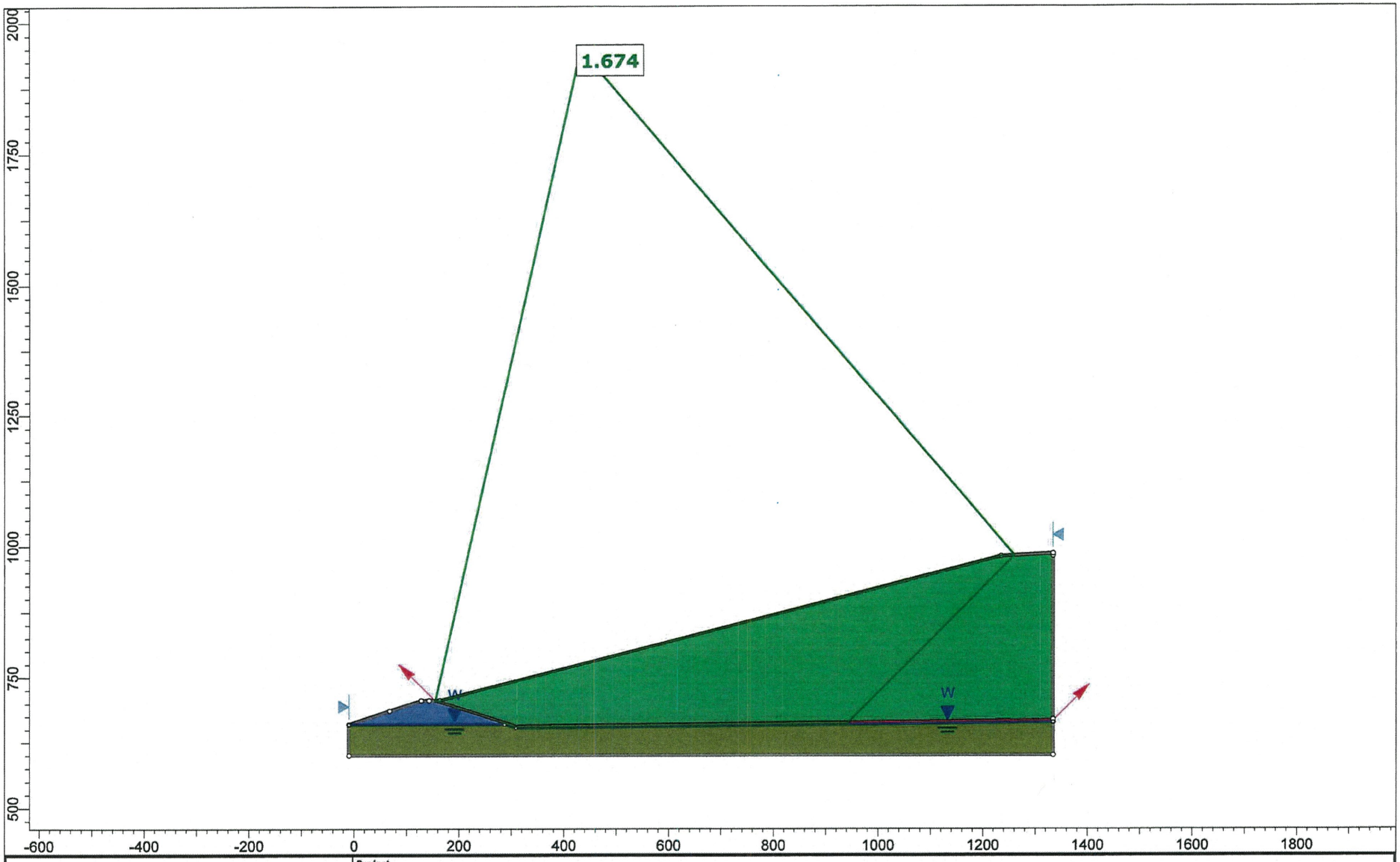
Materials

WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	1000
Friction Angle [deg]	39.1
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	1000
Friction Angle [deg]	38.6
Water Surface	Water Table
Hu Value	1
FC	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.673790
Axis Location:	432.714, 1949.263
Left Slip Surface Endpoint:	155.196, 706.000
Right Slip Surface Endpoint:	1260.813, 981.291
Resisting Moment:	6.81008e+09 lb-ft
Driving Moment:	4.06867e+09 lb-ft
Total Slice Area:	150714 ft2
Surface Horizontal Width:	1105.62 ft
Surface Average Height:	136.317 ft



Weaver Consultants Group

SLIDEINTERPRET 9.018

Project	TURKEY CREEK DIKE STABILITY		
Group	ENGINEERING	Scenario	TOTAL STRESS - BLOCK
Drawn By	PREP BY: MB CHKD BY:DEP	Company	WEAVER CONSULTANTS GROUP
Date	12/16/2021	File Name	Total_Interim_Block.slmd

Slide Analysis Information

Total_Interim_Block

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

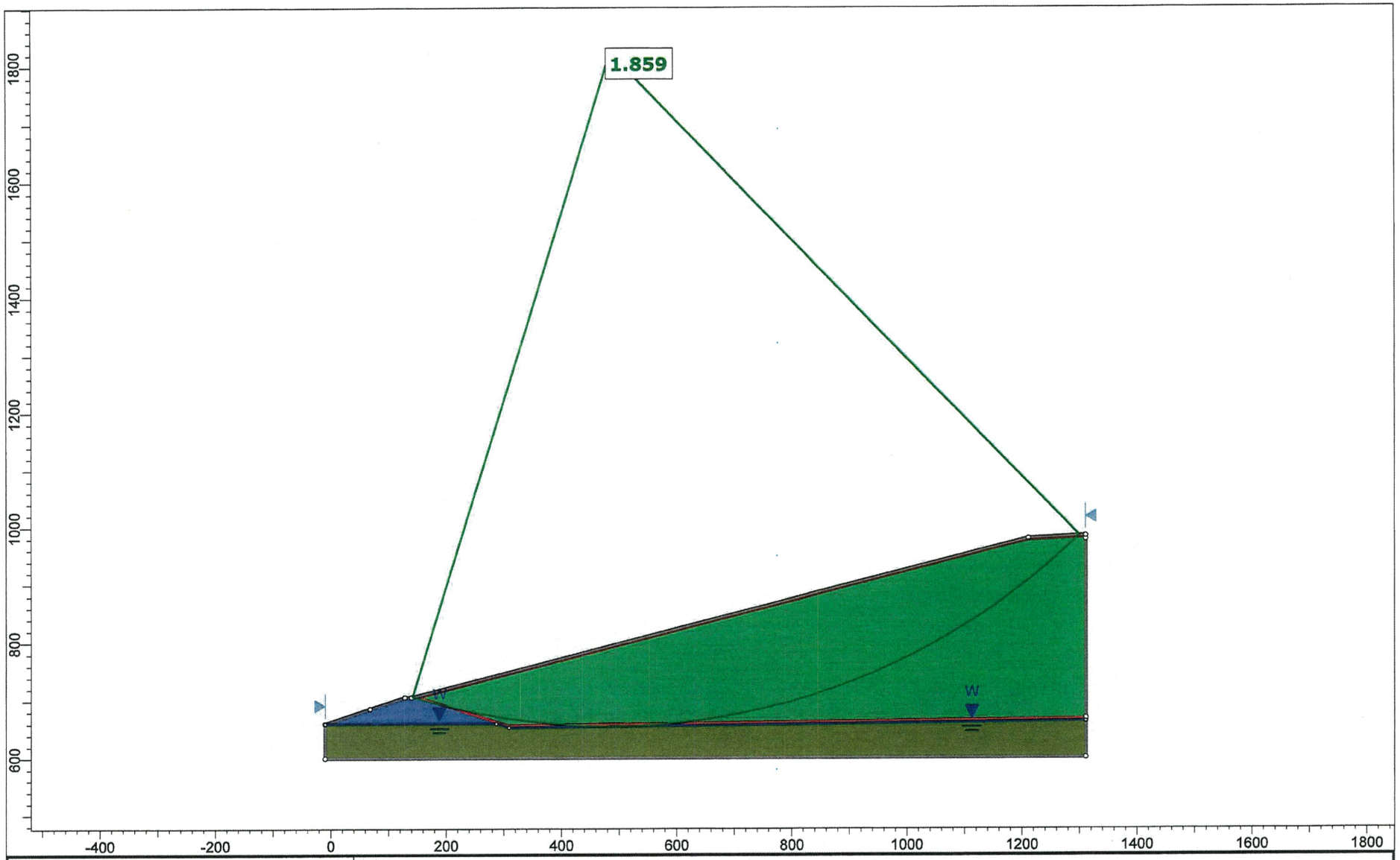
Materials

WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	2500
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	4100
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1
FC	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.673790
Axis Location:	432.714, 1949.263
Left Slip Surface Endpoint:	155.196, 706.000
Right Slip Surface Endpoint:	1260.813, 981.291
Resisting Moment:	6.81008e+09 lb-ft
Driving Moment:	4.06867e+09 lb-ft
Total Slice Area:	150714 ft2
Surface Horizontal Width:	1105.62 ft
Surface Average Height:	136.317 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Effective_Final_Circular.slmd

Slide Analysis Information

Effective_Final_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

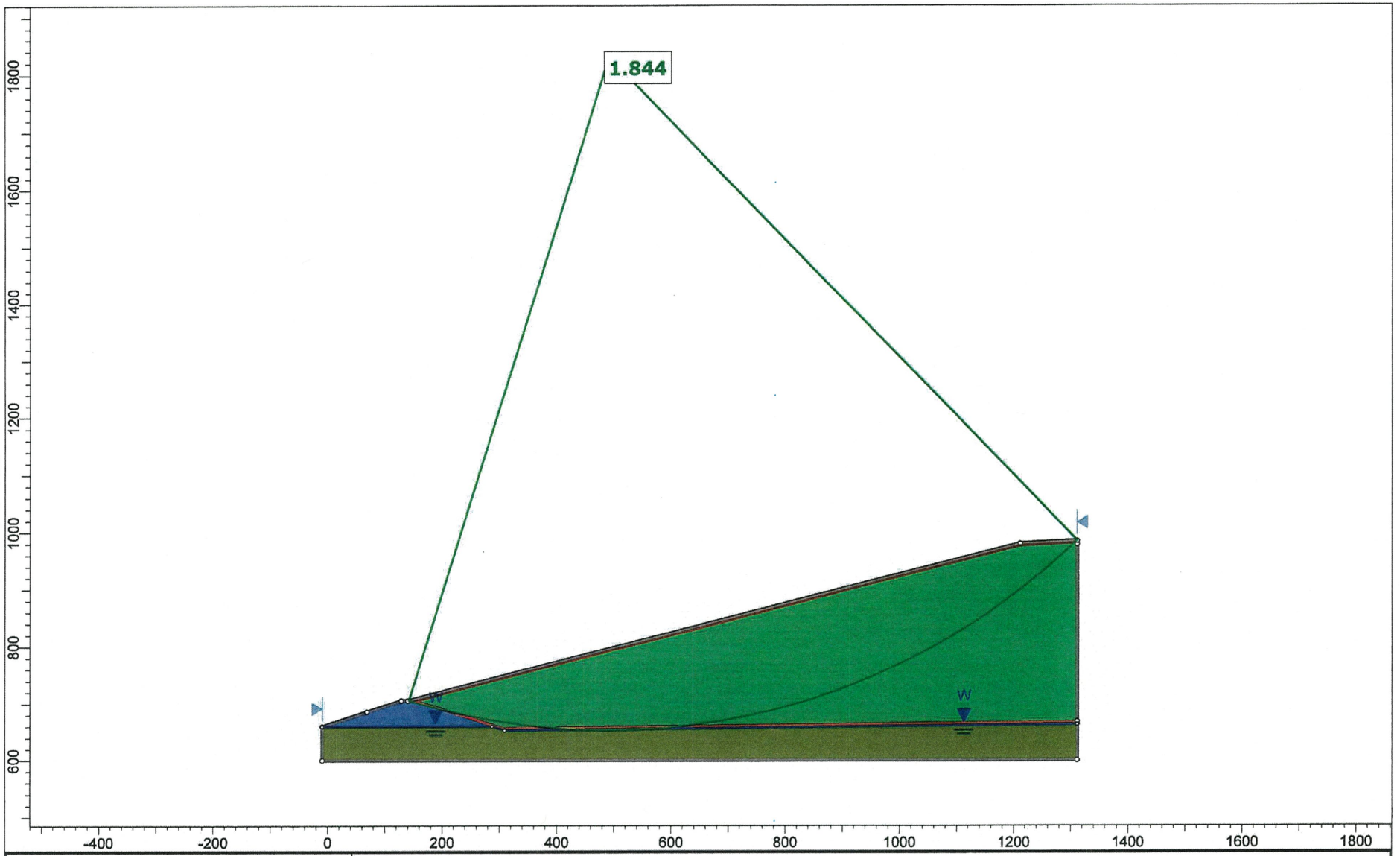
Materials

WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	1000
Friction Angle [deg]	39.1
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	1000
Friction Angle [deg]	38.6
Water Surface	Water Table
Hu Value	1
FC	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.859170
Center:	486.062, 1824.442
Radius:	1169.704
Left Slip Surface Endpoint:	142.053, 706.469
Right Slip Surface Endpoint:	1300.052, 984.426
Resisting Moment:	6.87155e+09 lb-ft
Driving Moment:	3.69603e+09 lb-ft
Total Slice Area:	140925 ft2
Surface Horizontal Width:	1158 ft
Surface Average Height:	121.697 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: TOTAL STRESS - CIRCULAR
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
	Date	12/16/2021	File Name: Total_Final_Circular.slmd

SLIDEINTERPRET 9.018

Slide Analysis Information

Total_Final_Circular

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

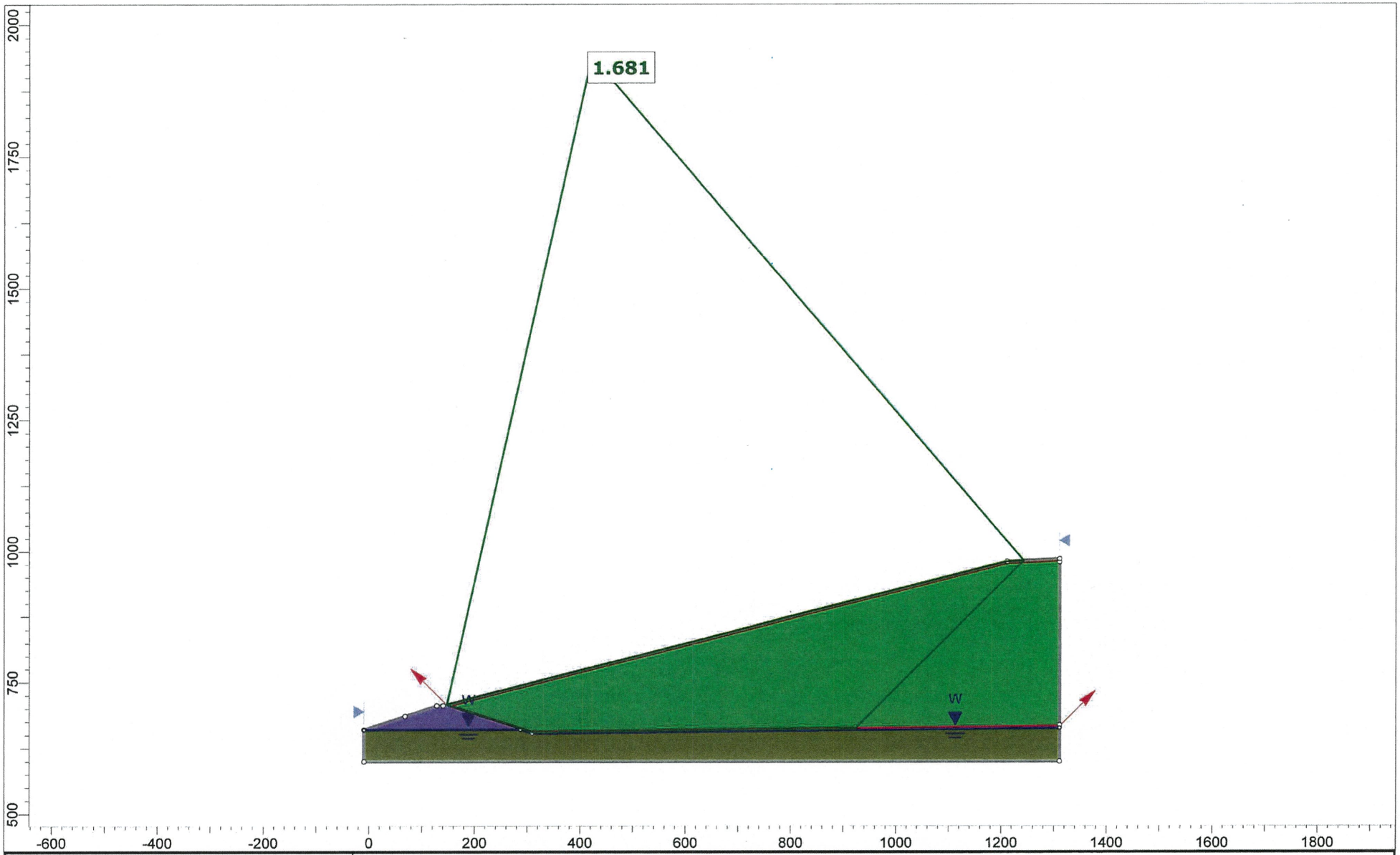
Materials

WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	2500
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	4100
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1
FC	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.843820
Center:	491.309, 1832.542
Radius:	1179.074
Left Slip Surface Endpoint:	141.900, 706.430
Right Slip Surface Endpoint:	1310.967, 984.971
Resisting Moment:	7.0243e+09 lb-ft
Driving Moment:	3.80964e+09 lb-ft
Total Slice Area:	144718 ft2
Surface Horizontal Width:	1169.07 ft
Surface Average Height:	123.789 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: EFFECTIVE STRESS - BLOCK
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
	Date	12/16/2021	File Name: Effective_Final_Block.slmd

SLIDEINTERPRET 9.018

Slide Analysis Information

Effective_Final_Block

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

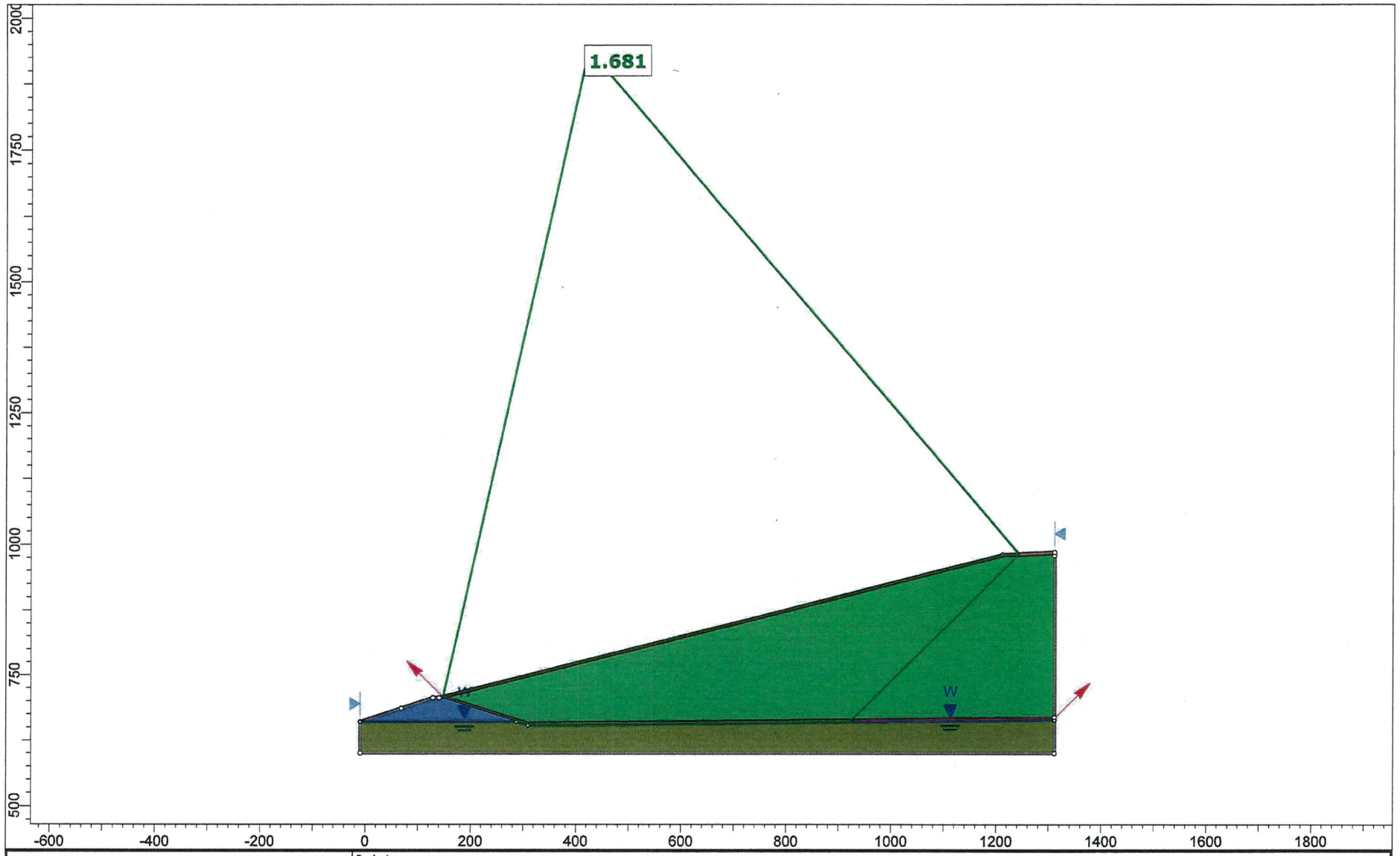
Materials

WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	1000
Friction Angle [deg]	39.1
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	1000
Friction Angle [deg]	38.6
Water Surface	Water Table
Hu Value	1
FC	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

FS	1.680800
Axis Location:	421.685, 1940.326
Left Slip Surface Endpoint:	147.586, 707.884
Right Slip Surface Endpoint:	1243.179, 981.582
Resisting Moment:	6.82251e+09 lb-ft
Driving Moment:	4.05908e+09 lb-ft
Total Slice Area:	151621 ft2
Surface Horizontal Width:	1095.59 ft
Surface Average Height:	138.392 ft



Weaver Consultants Group	Project	TURKEY CREEK DIKE STABILITY	
	Group	ENGINEERING	Scenario: TOTAL STRESS - BLOCK
	Drawn By	PREP BY: MB CHKD BY:DEP	Company: WEAVER CONSULTANTS GROUP
SLIDEINTERPRET 9.018	Date	12/16/2021	File Name: Total_Final_Block.slmd

Slide Analysis Information

Total_Final_Block

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Bishop simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Materials

WASTE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	100
Saturated Unit Weight [lbs/ft3]	100
Cohesion [psf]	288
Friction Angle [deg]	23
Water Surface	None
Ru Value	0
LINER	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	120
Saturated Unit Weight [lbs/ft3]	125
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0
UPPER SAND	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	125.9
Saturated Unit Weight [lbs/ft3]	129.7
Cohesion [psf]	2500
Friction Angle [deg]	0
Water Surface	None
Ru Value	0
BOUNDING_SHALE	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	133
Saturated Unit Weight [lbs/ft3]	135
Cohesion [psf]	4100
Friction Angle [deg]	0
Water Surface	Water Table
Hu Value	1
FC	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	120
Cohesion [psf]	100
Friction Angle [deg]	16
Water Surface	None
Ru Value	0

Global Minimums

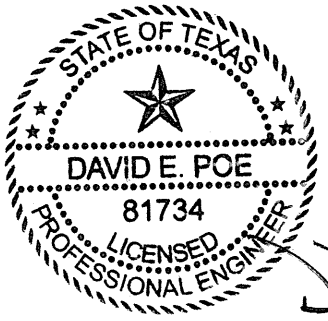
Method: bishop simplified

FS	1.680800
Axis Location:	421.685, 1940.326
Left Slip Surface Endpoint:	147.586, 707.884
Right Slip Surface Endpoint:	1243.179, 981.582
Resisting Moment:	6.82251e+09 lb-ft
Driving Moment:	4.05908e+09 lb-ft
Total Slice Area:	151621 ft2
Surface Horizontal Width:	1095.59 ft
Surface Average Height:	138.392 ft

APPENDIX IIIA-C-4

INFINITE SLOPE STABILITY ANALYSIS

Includes pages IIIA-C-4-1 through IIIA-C-4-5



02-22-2022

TURKEY CREEK LANDFILL
0771-368-11-123
APPENDIX IIIA-C-4
CONTAINMENT DIKE -
INFINITE SLOPE STABILITY ANALYSIS

Required:

Evaluate the stability of the Class 1 containment dike for when vegetation has been established on the top 6 inches of the exterior slope of the containment dike.

Method:

Use Duncan and Buchignani's method for infinite stability analysis to evaluate the stability of the compacted clay-rich soil of the Class 1 containment dike for the condition when the exterior slope of the containment dike contains vegetation.

The strength parameters for the top 6 inches of the containment dike soil have been lowered compared to the "at-construction" strength parameters selected for the compacted clay-rich soil of the containment dike.

References:

1. US Army Corps of Engineers, *Slope Stability*, Engineering and Design Manual, EM 1110-2-1902, October 31, 2003.
2. Koerner, Robert M., *Analysis and Design of Veneer Cover Soils*, 1998 Sixth International Conference of Geosynthetics.

Solution:

As discussed in the Method section, the strength parameters for the top 6 inches of containment dike soil have been lowered compared to the "at-construction" strength parameters to account for the vegetation layer as shown in the table below.

Item	Effective Stress Strength Parameters		Total Stress Strength Parameters	
	Internal Friction Angle (deg)	Cohesion (psf)	Internal Friction Angle (deg)	Cohesion (psf)
Top 6 Inches of Exterior Slope of Containment Dike	12.8	80	0	200

Calculate factor of safety:
See Stability Charts for Infinite Slopes on page IIIA-C-3-5 for procedure.

$$F.S. = A\frac{\tan\Delta}{\tan\beta} + B\frac{C_a}{\gamma H}$$

where: H = thickness of material above interface (ft)

It is assumed that the internal strength parameters of the soil installed will govern and that the soil is saturated.

Effective Stress Condition:		
ϕ' =	12.8	deg
β =	14.04	deg
A =	0.7	
c' =	80	psf
B =	4.3	
γ =	120	pcf
H =	0.5	ft

Total Stress Condition:		
ϕ =	0	deg
β =	14.04	deg
A =	0.7	
c =	200	psf
B =	4.3	
γ =	120	pcf
H =	0.5	ft

Calculate pore pressure ratio for saturated soil:

$$r_u = \frac{X}{T} \times \frac{\gamma_w}{\gamma} Cos^2\beta$$

To be conservative the soil above the interface evaluated is assumed to be saturated (X=T).
This assumption provides maximum pore pressure ratio (ru) as shown on page IIIA-C-3-3.

r_u= 0.24
slope ratio, b= 4.00

Use r_u and slope ratio, b, to determine parameters A and B on page IIIA-C-3-5.

Effective Stress Condition:	
F.S. =	6.4

Total Stress Condition:	
F.S. =	14.3

Conclusion:

The calculated factor of safety is greater than the required factor of safety of 1.5 per 30 TAC §330.590(F)(24)(i)(II).

TURKEY CREEK LANDFILL
0771-368-11-123
APPENDIX IIIA-C-4
SOIL COVER SYSTEM
INFINITE SLOPE STABILITY ANALYSIS

Required: Evaluate the stability of the interfaces for the (1) intermediate cover layer and (2) final cover system for the exterior sideslopes of the Class 1 waste fill area utilizing the Soil Cover System Option.

Method: Use Duncan and Buchignani's method for infinite stability analyses.

References:

1. US Army Corps of Engineers, *Slope Stability* , Engineering and Design Manual, EM 1110-2-1902, October 31, 2003.
2. Koerner, Robert M., *Analysis and Design of Veneer Cover Soils* , 1998 Sixth International Conference of Geosynthetics.

Solution:

The strength parameters are provided below.

Item	Cohesion (psf)	Friction Angle (deg)
Interim Condition (Prior to Final Closure)		
Soil Cover/Waste	300	25
Final Condition (at Final Closure)		
Erosion Layer/Geocomposite	100	18
Geocomposite/Textured Geomembrane	100	21
Textured Geomembrane/Clay Infiltration Layer	200	15

Calculate factor of safety:
See Stability Charts for Infinite Slopes on page IIIA-C-3-5 for procedure.

$$F.S. = A\frac{\tan\Delta}{\tan\beta} + B\frac{C_a}{\gamma H}$$

where: H = thickness of material above interface (ft)

Calculate pore pressure ratio for saturated soil:

$$r_u = \frac{X}{T} \times \frac{\gamma_w}{\gamma} Cos^2\beta$$

To be conservative the soil thickness above the interface evaluated is assumed to be saturated (X=T). This assumption provides maximum pore pressure ratio (r_u) as shown on page IIIA-C-3-5.

r_u= 0.47
slope ratio, b= 4.00 A and B on page IIIA-C-3-5.
(Use r_u and slope ratio, b, to determine parameters)

The stability of the interfaces for the (1) interim condition and (2) final condition are calculated below.

1. Interim Condition

Soil Cover/Waste:

ϕ' =	25	deg
β =	14.04	deg (4H:1V Slope)
A =	0.5	
c' =	300	psf
B =	4.3	
γ =	125	pcf
H =	1.5	ft (Intermediate Cover)
F.S. =	7.81	

2. Final Condition

Erosion Layer/Geocomposite:

ϕ' =	18	deg
β =	14.04	deg
A =	0.5	
c' =	100	psf
B =	4.3	
γ =	125	pcf
H =	2	ft
F.S. =	2.37	

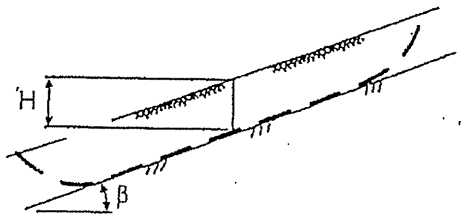
Geocomposite/Textured Geomembrane:

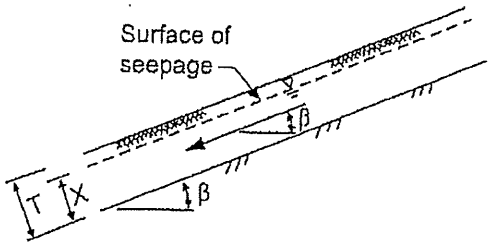
ϕ' =	21	deg
β =	14.04	deg
A =	0.5	
c' =	100	psf
B =	4.3	
γ =	125	pcf
H =	2	ft
F.S. =	2.49	

Textured Geomembrane/Clay Infiltration Layer:

ϕ' =	15	deg
β =	14.04	deg
A =	0.5	
c' =	200	psf
B =	4.3	
γ =	125	pcf
H =	2	ft
F.S. =	3.98	

Conclusion: The calculated factors of safety are greater than the required factor of safety of 1.5 per Section Title 30 TAC §335.590(24)(F)(i)(II).





γ = total unit weight of soil

γ_w = unit weight of water

c' = cohesion intercept

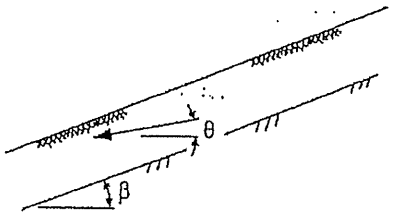
ϕ' = friction angle

r_u = pore pressure ratio = $u/\gamma H$

u = pore pressure at depth H

Seepage parallel to slope

$$r_u = \frac{X}{T}\frac{\gamma_w}{\gamma}\cos^2\beta$$

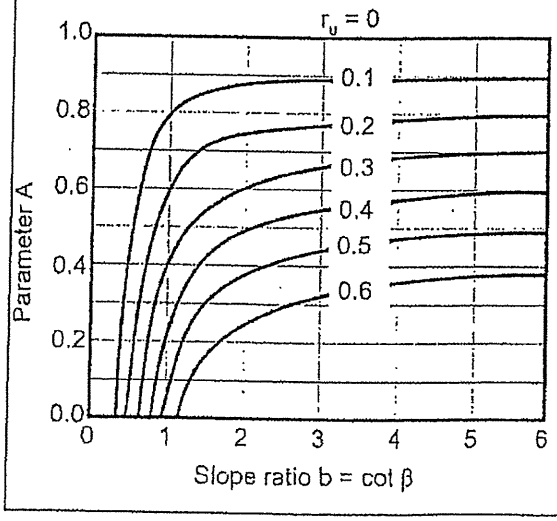


Seepage emerging from slope

$$r_u = \frac{\gamma_w}{\gamma}\frac{1}{1+\tan\beta\tan\theta}$$

Steps.

1. Determine r_u from measured pore pressure or formulas at right.
2. Determine A and B from charts below.
3. Calculate $F = A\dfrac{\tan\phi'}{\tan\beta} + B\dfrac{c'}{\gamma H}$



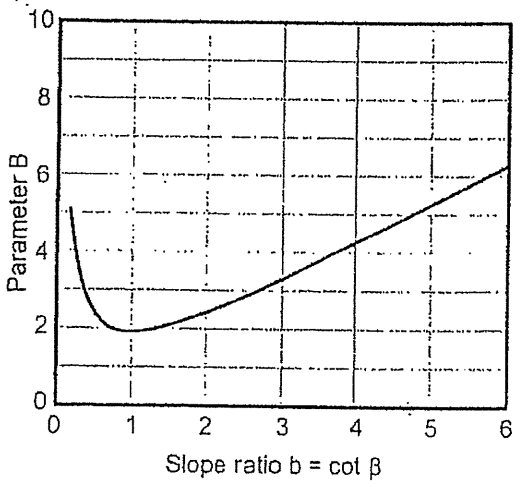
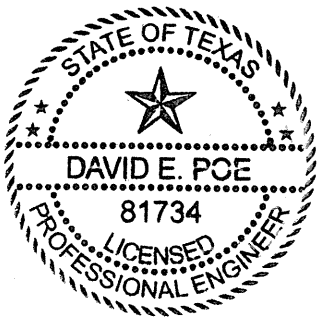


Figure E-7. Slope stability charts for infinite slopes (after Duncan, Buchlanani, and DeWet 1987)

APPENDIX IIIA-C-5

SETTLEMENT ANALYSIS

Includes pages IIIA-C-5-1 through IIIA-C-5-12



TURKEY CREEK LANDFILL
0771-368-11-123
APPENDIX IIIA-C-5
CLASS 1 SOLID WASTE AND FINAL COVER SETTLEMENT AND STRAIN

Required: Develop the post-settlement slope of the closed conditions for both the containment dike option and soil cover system option for above grade Class 1 waste placement. The analyses will demonstate that the strain is minimal, and will not adversly impact the integrity of the final cover systems, or the integrity of the individual containment dikes (by demonstrating that the sideslope strain is within acceptable limits for compacted clay material). For this analysis, a worst case scenario of a 20-foot thick compacted soil and final cover system (which represents a combination of the soil containment dike and soil final cover thickness) was developed, and assume demonstrative of a worst-case scenario for both the containment dike and soil cover system options. The analysis was performed for both the sideslope and topslope, although the topslope settlement will not be affected by the sideslope containment dikes. The topslope settlement analysis included an analysis across the location that the soil cover/containment dike contacts the final cover system (only) near the crest of the landfill. Additional final cover settlement-strain demonstrations (including a topslope demonstration) are included in Appendix IIIM - Geotechnical Report.

Method:

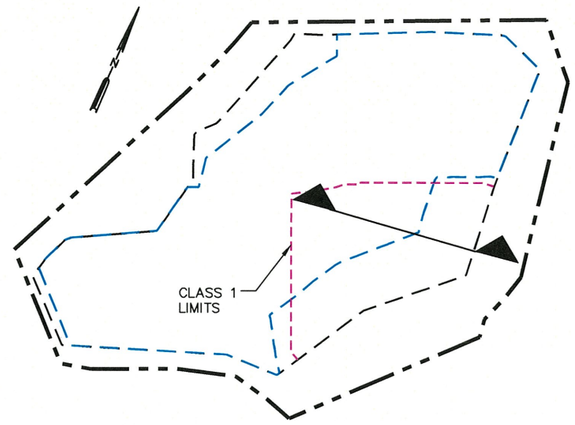
A. Estimate primary settlement of waste below the final cover system.
B. Estimate secondary settlement of waste below the final cover system.
C. Estimate total settlement of waste below the final cover system.
D. Verify that strain induced on the final cover and soil containment dikes due to settlement is within acceptable limits.

Description of Contents:

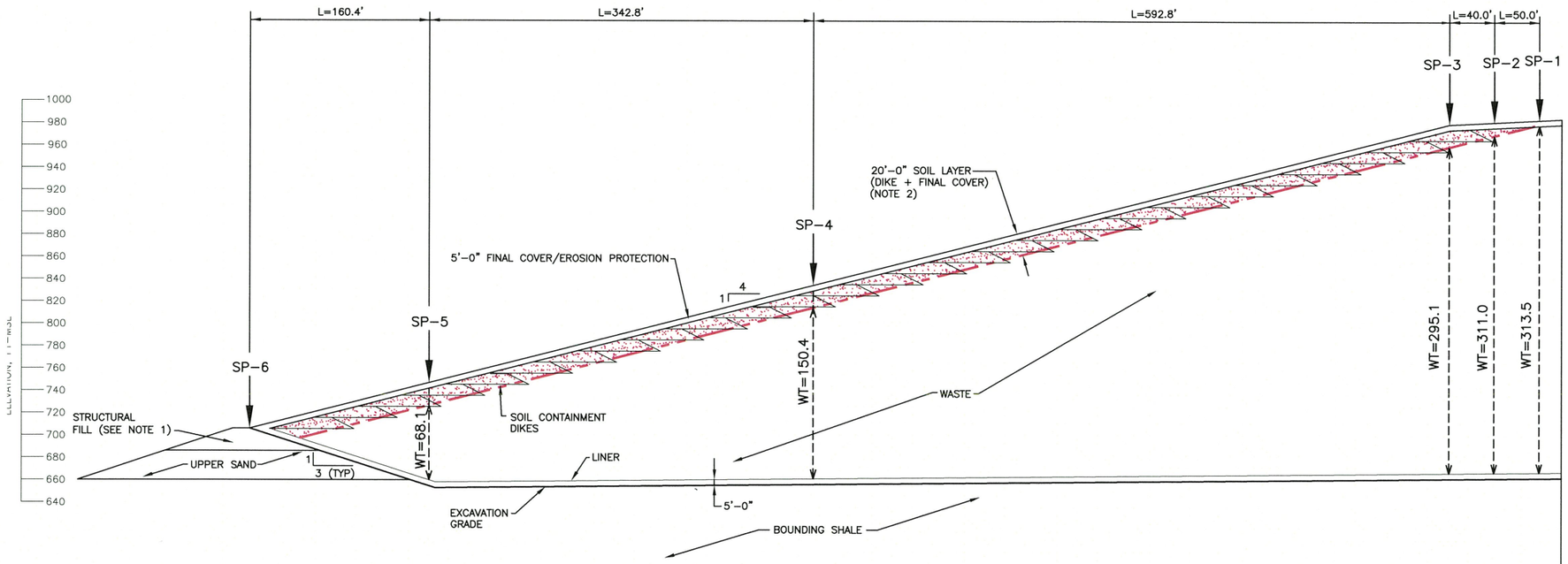
- Sheet IIIA-C-5-1 describes the requirements and analysis methods.
- Sheet IIIA-C-5-2 provides a cross-section and points used for the analysis.
- Sheets IIIA-C-5-3 through IIIA-C-5-10 details the procedures for the MSW and final cover settlement and strain calculations.
- Sheet IIIA-C-5-11 provides a summary of the settlement analysis for the final cover and containment dike.
- Sheet IIIA-C-5-12 provides a summary of the strain evaluation for the final cover and containment dike.

References

1. Sowers, George F., Settlement of Solid Waste, *Proceedings of the Eighth International Conference on Soil Mechanics and Foundations Engineering, 1973* .
2. Quian, Xuede, R.M. Koerner, D. H. Gray, Geotechnical Aspects of Landfill Design and Construction, Prentice-Hall, Inc., New Jersey, 2002.
3. Koerner, Robert M., Designing with Geosynthetics, Third Edition. Prentice-Hall, New Jersey, 1994.
4. Acar, Yalcin B. & Daniel, David E., *Geoenvironment 2000 Characterization, Containment, Remediation, and Performance in Environmental Geotechnics,* Volume 2, American Society of Civil Engineers, 1995.
5. Zornberg, Jorge G., et al., *Retention of Free Liquids in Landfills Undergoing* Vertical Expansion, Journal of Geotechnical and Geoenvironmental Engineering, July 1999.
6. Fassett, Jeffrey B., et al., Geotechnical Properties of Municipal Solid Wastes and Their Use in Landfill Design, Waste Tech, 1994.
7. Beggs, Ian D. et.al. Assessment of Maximum Allowable Strains in Polyethylene and Polypropylene Geomembranes. Geo-Frontiers Congress. Austin, TX 2005.



SECTION LOCATION MAP
NTS



CONTAINMENT DIKE OPTION–CLOSED CONDITION

0 50 100
SCALE IN FEET

LEGEND

SP–1 — SETTLEMENT POINT FOR ANALYSIS

WT=XX.XX — WASTE THICKNESS

L=XX.XX — LENGTH BETWEEN POINTS

– – – – 20' SOIL LAYER FOR SETTLEMENT ANALYSIS

STATE OF TEXAS
DAVID E. POE
81734
LICENSED
PROFESSIONAL ENGINEER
JJP
5-22-2022

NOTES:

1. STRUCTURAL FILL TO BE PLACED IN ACCORDANCE WITH THE LINER QUALITY CONTROL PLAN.
2. FOR SETTLEMENT–STRAIN ANALYSIS, A 20–FOOT–THICK LAYER REPRESENTING THE FINAL COVER COVER AND CONTAINMENT DIKES WAS USED. THIS IS REPRESENTATIVE OF A WORST CASE SCENARIO RELATED TO THE MAGNITUDE OF SETTLEMENT–INDUCING LOAD ON THE UNDERLYING WASTE.

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DRAWN BY: SRF
DESIGN BY: RCE
REVIEWED BY: DEP

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TBPE REGISTRATION NO. F-3727

PREPARED FOR
TEXAS REGIONAL LANDFILL COMPANY, LP

REVISIONS		
NO.	DATE	DESCRIPTION

MAJOR PERMIT AMENDMENT
CLASS I FINAL CONDITION
SETTLEMENT–STRAIN ANALYSIS

TURKEY CREEK LANDFILL
JOHNSON COUNTY, TEXAS

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SHEET IIIA-C-5-2

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Solution:

A) Estimate primary settlement of waste below the final cover system.

MSW will undergo primary consolidation due to its own weight, final cover, equipment, etc. Primary consolidation occurs quickly, generally within the first month after loading. Therefore, the weight of the final cover system is the only remaining factor that contributes to primary consolidation. In addition, by the time the construction of the final cover is complete, settlement of the waste due to the weight of the final cover will be complete.

Primary settlement is calculated using the following equation:

$$S_p = \frac{H_o C_c}{1+e_o} \log\left(\frac{\sigma'_o + \Delta\sigma}{\sigma'_o}\right)$$

S_p = primary settlement, ft
H_o = waste thickness below the final cover system, ft
C_c = compression index
e_o = void ratio of the waste layer below final cover before settlement (i.e., before final cover placement)
$\Delta\sigma$ = change in loading/increase in overburden pressure, psf
σ'_o = overburden pressure acting at mid-height of refuse below the final cover, psf

For this site assume: $C_c = 0.35 \times e_o$ (Ref. 1, p. 210)

The compression index is a function of the void ratio. The compression index can range from $C_c=0.15e_o$ to $C_c=0.55e_o$ for fills that are low and high in organic content, respectively. An average compression index value was chosen because it is consistent with the types of waste accepted in the past. It is also representative of the minimal amount of settlement the site has experienced.

The average void ratio of waste below the final cover is estimated by determining the void ratio at the midpoint of the waste column below the final cover system. The void ratio is calculated for each settlement evaluation point using the following equation.

$e_o = 1.86 - 0.00102\ \sigma'_o$ (Ref. 5, p. 590)

where: σ'_o = overburden pressure in kPa

$\sigma'_o = 0.5\ \gamma_{msw}\ H_o$
$\Delta\sigma = \gamma_{cov}\ T_c$
γ_{msw} = unit weight of waste below the final cover system, pcf
γ_{cov} = unit weight of cover, pcf
T_c = thickness of final cover system, ft

Parameters:

γ_{cov} = 116 pcf
T_c = 5 feet
γ_{msw} = varies (see note below)

Note: γ_{msw} is selected based on the midpoint of the waste thicknesses below the final cover system using the Unit Weight Profile for Waste/Daily Cover within an MSW Landfill chart from Ref. 4.

The settlement points analyzed are shown on Figure IIIA-C-4-1. An example calculation of the estimated primary settlement is shown below for Evaluation Points 1 and 2. The estimated primary settlement for all evaluation points is shown on Sheet IIIA-C-4-10.

At Evaluation Point 1:

Top of Waste Elevation (ft-msl)= 984.3
Bottom of Waste Elevation (ft-msl)= 665.6
H_o = 313.7 ft
γ_{msw} = 80 pcf

$\sigma'_o = 0.5\ \gamma_{msw}\ H_o$
σ'_o = 12548.0 psf
σ'_o = 600.8 kPa

$e_o = 1.86 - 0.00102\ \sigma'_o$
e_o = 1.2

$C_c = 0.35\ e_o$
$C_c =$ 0.44

$\Delta\sigma =$ 580.0 psf

$$S_p = \frac{191.7x0.54}{1+1.5}\log\left(\frac{6709.5+406.0}{6709.5}\right)$$

$S_p =$ 1.2 ft

At Evaluation Point 2:

Top of Waste Elevation (ft-msl)= 981.3
Bottom of Waste Elevation (ft-msl)= 665.1
$H_o =$ 311.2 ft
$\gamma_{msw} =$ 80 pcf

$\sigma'_o = 0.5\ \gamma_{msw}\ H_o$
$\sigma'_o =$ 12448.0 psf
$\sigma'_o =$ 596.0 kPa

$e_o = 1.86 - 0.00102\ \sigma'_o$
$e_o =$ 1.3

$C_c = 0.35\ e_o$
$C_c =$ 0.44

$\Delta\sigma =$ 580.0 psf

$$S_p = \frac{141.7x0.58}{1+1.6}\log\left(\frac{4392.7+406.0}{4392.7}\right)$$

$S_p =$ 1.2 ft

B) Estimate secondary settlement of waste below the final cover system.

Secondary consolidation continues at substantial rates for periods of time well beyond primary settlement. It is a combination of mechanical secondary compression, physico-chemical reaction, and bio-chemical decay. The settlement-log time relationship is similar to secondary compression of soils and can be expressed by:

$$S_c = \frac{H'_o\ \alpha}{1 + e'_o}\log\ (t_2/t_1)$$ (Ref. 2, p. 451)

Parameters:

S_c = secondary settlement, ft
α = secondary compression index
e'_o = void ratio of the waste layer below the final cover after primary settlement has occurred due to the final cover
H'_o = waste thickness below the final cover system after settlement, ft
t_1 = starting time of secondary settlement in years
t_2 = time at which settlement is determined in years

For this site assume: $\alpha =$ 0.06 x e'_o (Ref. 1, p. 210)

As reported by Sowers (Ref. 1), the secondary compression index is used to estimate waste decomposition. The secondary compression index ranges from $\alpha = 0.03e'_o$ to $\alpha = 0.09e'_o$ for conditions that are unfavorable and favorable to decay, respectively. An average secondary compression index value was chosen because it is consistent with the types of waste accepted in the past. It is also representative of the minimal amount of settlement the site has experienced.

The void ratio of the waste below the final cover at closure is a function of the overburden pressure caused by placement of the final cover system. The void ratio is calculated for each settlement evaluation point using the following equation.

$$e'_o = 1.86 - 0.00102\,\sigma''_o \qquad \text{(Ref. 5, p. 590)}$$

where: σ''_o = overburden pressure in kPa

$\sigma''_o = 0.5\,\gamma'_{msw}\,H'_o$
γ'_{msw} = unit weight of waste below the final cover after primary settlement has occurred, pcf

For this site, the void ratio after primary settlement for the waste/cover soils below the final cover system varies between 1.5 to 1.9. Therefore, the secondary compression index will range between 0.09 to 0.11. Most literature sources report the secondary compression index in terms of the "modified secondary compression index" (Refs. 2, 6). The modified secondary compression index is defined by the following.

$$C'_\alpha = \frac{\alpha}{1 + e'_o}$$

The secondary compression index calculated for this site translates to a modified secondary compression index of 0.03 to 0.04 (for a void ratio of 1.5 to 1.9). These values are consistent with reported values for the modified secondary compression index which vary from 0.03 to 0.1 (Refs. 2, 6).

Time frame used for this analysis:

t_1 =	0.083	years
t_2 =	30.0	years (postclosure period)

An example calculation of the estimated secondary settlement using the above secondary settlement period is shown below for Evaluation Points 1 and 2. The estimated secondary settlement for all evaluation points is shown on Sheet IIIE-B-3-10.

At Evaluation Point 1:

$H'_o = H_o - S_p$

H_o' = 312.5 ft

$\sigma''_o = 0.5\ \gamma'_{msw}\ H'_o$

γ'_{msw} = 80 pcf

σ''_o = 12500.2 psf

σ''_o = 598.5 kPa

$e'_o = 1.86 - 0.00102\ \sigma''_o$

e'_o = 1.2

$\alpha = 0.06\ e'_o$

α = 0.07

$$S_c = \frac{H'_o\ \alpha}{1 + e'_o} \log (t_2/t_1)$$

$$S_c = \frac{190.7 \text{ x } 0.09}{1 + 1.5} \log (30/0.083)$$

S_c = 26.6 ft

At Evaluation Point 2:

$H'_o = H_o - S_p$
$H_o' =$ 310.0 ft

$\sigma''_o = 0.5\ \gamma'_{msw}\ H'_o$
$\gamma'_{msw} =$ 80 pcf
$\sigma''_o =$ 12400.1 psf
$\sigma''_o =$ 593.7 kPa

$e'_o = 1.86 - 0.00102\ \sigma''_o$
$e'_o =$ 1.3

$\alpha = 0.06\ e'_o$
$\alpha =$ 0.08

$$S_c = \frac{H'_o\ \alpha}{1 + e'_o} \log (t_2/t_1)$$

$$S_c = \frac{140.5 \times 0.10}{1+1.6} \log (30.0/0.083)$$

$S_c =$ 26.5 ft

C) Estimate total settlement of waste below the final cover system.

Total settlement is the combination of primary and secondary settlement. An example calculation of the estimated total settlement is shown below for Evaluation Points 1 and 2. The estimated total settlement for all evaluation points is shown on page IIIA-C-4-10.

At Evaluation Point 1:				
Thickness of waste column, ft =	313.7	Primary Settlement =	1.2	ft
		Secondary Settlement =	26.6	ft
		Total Settlement =	27.84	ft
At Evaluation Point 2:				
Thickness of waste column, ft=	311.2	Primary Settlement =	1.2	ft
		Secondary Settlement =	26.5	ft
		Total Settlement =	27.67	ft

D) Verify that strain induced on the geocomposite due to settlement is within acceptable limits.

Determine the post-settlement slope of the final cover system and verify the strain induced on the geocomposite due to settlement is within acceptable limits.

Note that negative values indicate the components are in compression.

$$\text{Strain} = \frac{L_f - L_o}{L_o} x100$$ (Reference 2, Page 472)

L_f = Final distance between evaluation points after total settlement (ft)
L_o = Initial distance between evaluation points before total settlement (ft)

An example calculation of the estimated strain is shown below for Evaluation Points 1 and 2. The estimated strain for all evaluation points is shown on page IIIA-C-4-11.

Evaluation Point 1 to Evaluation Point 2:

Initial Distance:

Evaluation Point 1 Elev. =	984.30 ft-msl	984.3
Evaluation Point 2 Elev. =	981.30 ft-msl	981.3
Plan View Distance=	50.60 ft	
L_o=	50.69 ft	

Total Settlement:

Total Settlement Point 1=	27.84 ft
Total Settlement Point 2=	27.67 ft

Final Distance (after settlement):

Evaluation Point 1 Elev. =	956.46 ft-msl
Evaluation Point 2 Elev. =	953.63 ft-msl
Plan View Distance=	50.60 ft
L_f=	50.68 ft

Strain= -0.019%

Conclusions:

The calculated strain for the containment dike and final cover is acceptable. The below are the strain limits considered for this analysis. The analysis is considered a worst case scenario for both the containment dike option and the soil cover system option.

Stain Limits

- Compacted clay component of final cover has the smallest average allowable tensile strain value which is 0.5 percent (Reference 2, Page 469).
- The allowable tensile strain for an LDPE geomembrane is 8 to 12 percent (Reference 7).
- The allowable tensile strain for a drainage geocomposite is more than 20 percent for the geotextile (reference 3, page 112) and 200 percent for the geonet (reference 3, page 400).
- The maximum calculated strain (0.313%) is acceptable; therefore the system will be stable.

TABLE 5-1. CLASS 1 FINAL COVER EVALUATION - SETTLEMENT SUMMARY

Evaluation Point[1]	Initial Top of Final Cover Elevation (ft-msl)	Thickness of Soil Cover over Top of Waste [1]	Initial Top of Waste Elevation (ft-msl)	Bottom of Waste Elevation (ft-msl)	H_o (ft)	γ_{msw} (pcf)	σ'_o (psf)	$\Delta\sigma$ (psf)	e_o	C_c	S_p (ft)	H'_o (ft)	γ'_{msw} (pcf)	σ''_o (psf)	e'_o	α	S_c (ft)	Total Settlement (ft)	Post-Settlement Top of Final Cover Elevation (ft-msl)
1	984.3	5.0	979.3	665.8	313.5	80	12540.0	580.0	1.25	0.44	1.2	312.3	80	12492.2	1.2	0.07	26.6	27.8	956.5
2	981.3	5.0	976.3	665.3	311.0	80	12440.0	580.0	1.25	0.44	1.2	309.8	80	12392.1	1.3	0.08	26.5	27.7	953.6
3	980.0	20.0	960.0	664.9	295.1	79	11656.5	2320.0	1.29	0.45	4.6	290.5	79	11475.2	1.3	0.08	25.2	29.8	950.2
4	831.8	20.0	811.8	661.4	150.4	64	4812.8	2320.0	1.62	0.57	5.6	144.8	63	4562.2	1.6	0.10	13.8	19.4	812.4
5	746.1	20.0	726.1	658.0	68.1	52	1770.6	2320.0	1.77	0.62	5.5	62.6	51	1595.2	1.8	0.11	6.2	11.7	734.4
6	706.0	0.0	706.0	706.0	0.0	42	0.0	0.0	1.86	0.65	NA	NA	NA	NA	NA	NA	NA	0.0	706.0

[1] 5-ft Final Cover (only) or 20-ft Dike + Final Cover Combination

TURKEY CREEK LANDFILL
0771-368-11-123
APPENDIX IIIE-A-5
FINAL COVER SYSTEM PERCENT STRAIN SUMMARY

TABLE 5-2. FINAL COVER EVALUATION - STRAIN SUMMARY

Evaluation Point[1]		Initial Top of Final Cover Elevation (ft-msl)		Post-Settlement Top of Final Cover Elevation (ft-msl)		Plan View Distance (ft)	L_o (ft)	L_f (ft)	Initial Slope (ft/ft)	Post-Settlement Slope (ft/ft)	Strain (%)[2]
A	B	A	B	A	B						
1	2	984.3	981.3	956.5	953.6	50.0	50.1	50.1	0.060	0.057	-0.019
2 (Note 3)	3	981.3	980.0	953.6	950.2	40.0	40.0	40.1	0.032	0.086	0.313
3	4	980.0	831.8	950.2	812.4	592.8	611.0	608.6	0.250	0.232	-0.400
4	5	831.8	746.1	812.4	734.4	342.8	353.4	351.6	0.250	0.228	-0.504
5	6	746.1	706.0	734.4	706.0	160.4	165.3	162.9	0.250	0.177	-1.476
3	6	980.0	706.0	950.2	706.0	847.3	890.5	881.8	0.323	0.288	-0.978

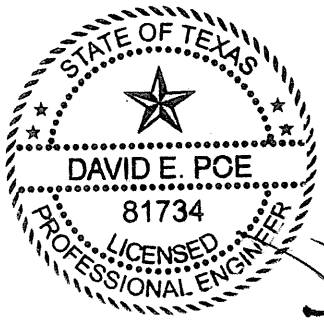
[1] Refer to Sheet IIIA-C-4-10 for Evaluation Point locations. The "A" and "B" points represent the upgradient and downgradient endpoints, respectively.

[2] Strain values shown as negative represent compressing of the cover components versus elongation.

[3]Analysis between point 2 and 3 represent strain at the transition from the sideslope containment dikes to the topslope final cover system.

APPENDIX IIIA-C-6

CLASS 1 WASTE CONTAINMENT DIKE CONSTRUCTION RECORD



02-22-2022

CLASS 1 WASTE CONTAINMENT DIKE CONSTRUCTION RECORD

This form is to be completed by the landfill manager or designee (which may include a third party contractor) to document construction of the above grade Class 1 waste containment dikes. One form will be developed for each containment dike area. This form is to be provided to the Texas Licensed Professional Engineer that will prepare the Containment Dike Certification Form, consistent with Title 30 TAC §335.590(24)(F)(vi).

A. General Information

1. Area of construction (describe by attaching a drawing or by providing grid coordinates) _____

   _____

   _____

2. Dates of construction: _____
3. Describe clay rich soil source or soil borrow area: _____

   _____

4. Describe equipment used for construction (at a minimum, this must include type of equipment used to compact the dike):

   _____

   _____

B. Containment Dike Construction

1. Did the material used for the containment dike meet the borrow soil requirements listed in Appendix IIIA, Section 6.3.2 (attach testing information)?

   (Check one) Yes ☐ No ☐

2. Was the cover soil/waste proof-rolled prior to placement of the first containment dike lift (see requirements in Appendix IIIA, Section 6.3.2)?

   (Check one) Yes ☐ No ☐

3. Was each lift thickness equal to or less than 9 inches thick?
   (Check one) Yes ☐ No ☐
4. Was each containment dike lift compacted to a minimum 95 percent of the maximum dry density as determined by ASTM D 698 (see Appendix IIIA, Section 6.3.2 and attach testing information)?

   (Check one) Yes ☐ No ☐

5. Does the completed containment dike have the following dimensions: 17-foot top width, height of 10 feet, 4H:1V outside slope, and 2H:1V inside slope?

   (Check one) Yes ☐ No ☐

SIGNATURE OF LANDFILL MANAGER OR DESIGNEE

_____
(Signature)

_____
(Typed or Printed Name)

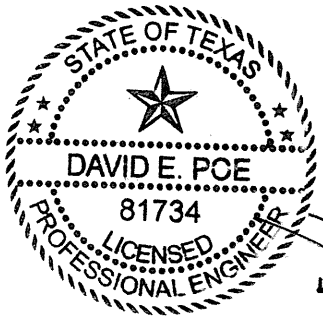
_____
(Title)

_____
(Date Signed)

APPENDIX IIIA-C-7

CONTAINMENT DIKE CERTIFICATION FORM

Note: This appendix includes an example Containment Dike Certification Form. The actual form used must comply with the latest version of the form included in Title 30 TAC §335.590(24)(F)(vi).



02-22-2022

CONTAINMENT DIKE CERTIFICATION FORM

"I, _____, Texas P.E. Registration Number _____
(name of Texas Licensed Professional Engineer)

certify under penalty of law that I have personally examined and am familiar with the design and construction of the dikes that are a portion of _____
(unit name)
_____.

I further certify that I have evaluated the dike design and materials of construction using accepted engineering procedures, have determined that the dike has structural integrity, and have determined that the structure:

(1) will withstand the stress of the pressure exerted by the types and amounts of wastes to be placed in the unit; and

(2) will not fail due to scouring or piping, without dependence on any liner system included in the unit construction.

_____ _____
(Signature) (Date)

(SEAL)